

## *Full Length Research Paper*

# How do online reviews affect purchasing intention?

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**Online reviews are widely used in recent years but scarcely researched. This study adopts the Elaboration Likelihood Model (ELM) to explore the effects of online reviews. Two hundred and fifty eight undergraduates expressed their attitudes about a product in an online experimental study. Four findings emerged from the results. First, the argument quality of online reviews has a positive effect on the purchasing intention of online shoppers. Second, the review quantity positively affects the purchasing intention of online shoppers. Third, people under high-involvement conditions take the central route in attitude change; that is, they are more influenced by review quality. Fourth, low-involvement consumers tend to adopt the peripheral route in forming attitude; that is, they are more persuaded by review quantity. Managerial implications are provided.**

**Key words:** Online review, elaboration likelihood model, attitude, persuasion

## INTRODUCTION

The advent of Internet has provided a competitive platform for online trading and marketing. It is estimated that the number of Internet users exceeds 900 million around the world while the information traffic doubles every 1 - 1.5 years (Kaynar and Amichai-Hamburger, 2008). The use of the internet as a venue for expressing opinions on products has become an important marketing tool to compete for consumer attention and visits (Chatterjee, 2001). Providing consumers a platform to voice their opinions and monitoring its electronic word-of-mouth (WOM) activity has become a business (Tedeschi 1999).

WOM is seen as more credible than advertising as it is perceived as having passed through the evaluation of "people like me" (Allsop et al., 2007). With the declining trust in advertising, WOM has become the most influential communication channel. Online consumer reviews provide a trusted source of product information for consumers - and therefore a potentially valuable sales asset. Positive consumer reviews on product or company is one of the best predictors of business growth (Keller, 2007).

The electronic WOM (eWOM) differs from interpersonal word of mouth in three aspects. First, most eWOM information are from strangers whom the receivers have never met. In most cases, the messengers of eWOM are anonymous to receivers. Therefore, the online recipient cannot use source similarity, expertise and accessibility to

determine the credibility of information. Second, there are no limits on time and space in generating eWOM. Internet surfers can participate in eWOM activities by posting or reading online reviews. Third, the eWOM can exit at relatively longer time than oral information. The online shoppers can trace the history of eWOM simply by pulling down pages on the internet.

Mayzlin and Chevalier (2006) studied the effects of online book reviews of Amazon.com and Barnesandnoble.com and found a positive influence of word of mouth on sales. Evidence from review-length data also shows that consumers read review content rather than relying only on summary statistics. Kaynar and Amichai-Hamburger (2008) indicated two generalizations that were found in previous work regarding the relationship between personality and the Internet. First, the behaviors of internet users are different from the real world behaviors. Second, the Internet enables users to improve their psychological well-being by through anonymity and high degree of control. However, little is known how online messages influence potential consumers' evaluations and purchasing intentions of products (Chatterjee, 2001). This study seeks to broaden our understanding of the behavior of online shoppers.

One theoretical perspective that can enrich our understanding of the influence of online reviews is the Elabo-

ration Likelihood Model (ELM). Park et al. (2007) applied the ELM to better understanding the mechanism of the influence of online consumer reviews on purchasing intention. An experimental study was conducted to investigate the moderating role of involvement in determining the route to persuasion. They found the quality and quantity of online reviews affect consumers' purchasing intention (PI) respectively but low-involvement consumers are affected by quantity rather than quality of online reviews while high-involvement consumers are affected mainly by review quantity when the review quality is high. The Park et al study pioneered the probe into the influence process of online reviews. However, the findings are not consistent with major ELM literatures (Sher and Lee, 2009). More research is required to further understand the effects of online review. Hence, this study contributes to broadening the ELM application into an emerging domain of knowledge. The present study contributes to the online behavior literature by introducing ELM as a referent theory.

### Literature review

Past literature finds that consumer satisfaction increases with the level of message quality, which leads to higher purchasing intention (Park et al., 2007). This stream of research focuses on the argument quality of message. Strong messages which are understandable and objective are considered more effective on attitude change than weak messages which exhibit emotional and subjective style (Petty and Cacioppo, 1984; Petty et al., 1983). Online reviews which consist of understandable and fact-supported arguments are more persuasive than reviews expressing subjective feelings and emotional comments. In other words, more favorable attitude will be formed when stronger online review quality is processed. Therefore, the below hypothesis is formulated:

H1: The argument quality of online reviews has a positive impact on purchasing intention.

An online review is similar to the messenger of traditional word-of-mouth communication. It is considered as a new form of recommender (Chatterjee, 2001). However, the contributors of online reviews are often prior users who wish to remain anonymous, while the sources of traditional word of mouth are familiar people. Lack of credibility motivates online shoppers to use other cues for attitude formulation. The quantity of online reviews is often used to determine the product popularity because it is considered to represent the market performance of the product (Chevalier and Mayzlin, 2006). The number of reviews can also provide a reference to strengthen online shoppers' confidence while reducing the uncomfortable feelings of risk exposure (Buttle, 1998). In other words, consumers may perceive that more reviews represent higher product popularity and importance. Therefore, we

propose the following hypothesis:

H2: The quantity of online reviews has a positive impact on purchasing intention.

### ELM

The perspective of dual-process theories is often used to examine the role of influence process in shaping consumer perception and behavior. Based on dual-process theories, attitude formation is not always based on effortful processing of persuasive information, but can sometimes be based on less effortful processing of heuristic cues. Dual-process theories further specify conditions under which each of the two processes is likely to occur (Chaiken and Trope, 1999). The Elaboration Likelihood Model (ELM) developed by Petty and Cacioppo (1981, 1986) provides a useful framework for understanding the effectiveness of persuasive communication.

According to the ELM, attitude change may occur via two routes of influence, the central route and the peripheral route. The two alternative routes differ in the amount of thoughtful processing of information or "elaboration." Individuals taking the central route think critically about issue-related arguments and scrutinize the merits and relevance of those arguments before forming attitude about the advertisement or product. On the other hand, individuals taking the peripheral route make less cognitive effort and rely on shortcuts such as number of arguments and physical attractiveness of endorsers when forming attitude. The ELM further posits that attitude change induced via the central route is more enduring and predictive of behavior than induced by the peripheral route since the former route is based on deliberate and thoughtful consideration of relevant arguments (Petty and Cacioppo, 1986).

Petty and Wegener (1999) suggest individuals in high elaboration likelihood state are more likely to engage in thoughtful processing of information and more likely to be persuaded by argument quality. On the other hand, people in low elaboration state tend to base their attitude change on peripheral cues. Elaboration likelihood moderates the effects of argument quality and peripheral cues on attitude change. According to the ELM, elaboration likelihood is determined by individual's motivation and ability to elaborate. Motivation refers to the individual's personal relevance to the persuasive message while ability is manifest in the individual's prior expertise with the attitude object. Individuals vary in their ability and motivation to elaborate. The moderating role of motivation is of interest to the present study.

### Involvement

Involvement refers to the perceived personal relevance of a product based on the individual consumer's needs, interests, and values (Park et al., 2007). Situational in-

volvement is a temporary arousal of interest within the time frame of a purchasing decision. Involvement with the product has a determining influence on information processing. The ELM posits that whether a consumer takes central or peripheral route in attitude formulation depends on the level of involvement (Petty and Cacioppo, 1984).

Individuals who are motivated to process a message tend to process persuasive arguments and base their judgment on the evaluation of persuasive attempts. They are more likely to engage in thoughtful thinking and attend to the persuasive arguments. A high-quality review is more logical and supports its evaluation with facts and evidence. Therefore, the following hypothesis is proposed:

H3: The purchasing intention of individuals under high involvement situation is more influenced by argument quality than quantity of online reviews.

Park et al. (2007) suggest that the quality and quantity of online reviews are important attributes affecting consumers' information processing. The quantity of online reviews of a product implies the product popularity since the number of reviews may represent the number of the interested consumers with prior purchasing or usage experience (Chatterjee, 2001). The ELM further suggests that low-involvement consumers expend less cognitive efforts when processing persuasive information. They tend to base their judgment on peripheral cues, such as the attractiveness of source and number of arguments. Therefore, the following hypothesis is formulated:

H4: The purchasing intention of individuals under low involvement situation is more influenced by argument quantity than quality of online reviews.

## METHOD

### Subjects and design

A total of 258 undergraduate students from a local business college participated in the experiment for extra credit. Subjects were randomly assigned to each of the cells in a 2 (involvement: high or low) x 2 (argument quality: strong or weak) x 2 (cue: large or small number) factorial design. Subjects participated in groups of 10 - 15 in a large computer laboratory. They were separated from each other and asked to complete the experiment independently.

### Procedure

A virtual shopping mall website - the X Shopping Mall - was developed for the study. A focus group of 20 subjects who did not participate in the later experiment was convened for deciding the product categories the consumers often choose to shop online. Cell phone was selected as the focal product category on the basis of majority opinion. This result was consistent with Girard et al. (2002)'s classification which also categorizes cell phone as a search product. In addition, the focus group agreed that the average number of online reviews which they perceived as large quantity is six, and one for perceived small quantity. This result was consistent with prior findings by Park et al. (2007).

In deciding the argument quality (AQ) of online reviews, thirty online reviews on cell phone products were selected from Amazon.com. These reviews were pre-tested by thirty subjects who were irrelevant to the experiment and were asked to evaluate the argument quality of reviews. Strong argument quality is defined as understandable, objective, and supported with relevant facts. Based on majority opinion, the pretest yielded six strong-argument reviews and six weak-argument reviews.

While entering the computer laboratory, each subject was seated in front of a desktop computer and randomly assigned a website corresponding to one of the eight treatments and was asked to read instructions on the computer screen. The first page of the X Shopping Mall introduced the purpose of study and involvement manipulation. In high-involvement situation, the subjects were told that a new type of cell phone which was introduced in other market was going to be introduced in the local market soon and the present study is critical in determining its market success. On the other hand, the low-involvement subjects were given the impression that the current study is an academic research on online consumer behavior.

The second page of the experimental website exhibits the seller-generated information which shows the advertising for A Model cell phone. It consists of a color photo and five product features.

After viewing the product information, the ensuing pages demonstrate the content and statistic of online reviews. Subjects in different cells received various quality and quantity of online reviews. On average, each subject took 15 minutes to complete the online experiment. Subjects were debriefed about the nature of study and asked not to discuss it with others before leaving the computer laboratory.

### Measures

Subjects were instructed to respond to measures of manipulation checks before taking dependent measures - purchasing intention and other questions. The manipulation check on involvement includes two items anchoring at a 7-point Likert scale: (1) I concentrate on the online reviews while browsing the website; and (2) I am interested in the online reviews on the focal product.

The manipulation check on the quality of reviews consisted of three items anchoring at a 7-point Likert scale: (1) Do these online reviews present sound arguments? (2) Are these online reviews credible? And (3) Do these online reviews provide facts in support of their position? (Park et al., 2007).

The manipulation check on the quantity of reviews measures the subjects' perceptions of the quantity of reviews. On the experimental website, the number of the reviews for the focal product is juxtaposed with the numbers of reviews for other cell phones irrelevant to the purpose of experiment. The former number is designed to contrast with the later numbers. Subjects were then asked to recall the number of reviews and indicate whether it is more or less than the numbers of other cell phone reviews.

The dependent measure of subjects' purchasing intention contains two questions: (1) how likely would you choose A Model cell phone next time you plan to purchase a cell phone of similar nature? And (2) would you recommend A Model cell phone to your friend? These two items are also anchored at a 7-point Likert scale.

## RESULTS

### Manipulation checks

Items of manipulation check on involvement yielded satisfactory reliability ( $\alpha = 0.69$ ). An ANOVA analysis indicated that involvement was manipulated successfully [F

**Table 1.** Means and standard deviations for each experimental cell on the purchasing intention

	Low-involvement		High-involvement	
	Weak AQ	Strong AQ	Weak AQ	Strong AQ
Small quantity	3.69(1.14) n = 29	3.52(1.07)n = 30	3.75(1.18) n = 34	4.55(1.15) n = 37
Large quantity	4.15(1.10) n = 31	4.38(0.71) n = 32	3.68(1.15) n = 31	4.71(1.00) n = 34

Note: Standard deviations are in parentheses.

(1, 256) = 5.415,  $p < 0.05$ ,  $M = 4.16$  and 4.52]. The reliability of items of manipulation check on the argument quality of online reviews also showed a good result ( $\alpha = 0.78$ ). These items were further averaged for an ANOVA analysis. The result provided evidence that the argument quality was successfully manipulated [F (1, 256) = 12.014,  $p < 0.001$ ,  $M = 3.83$  and 4.31]. Finally, the percentage of subjects who correctly recalled the number of reviews is 93%, while the percentage of subjects who rightly perceived the nature of the number (i.e. large or small than the other cell phone reviews) is 84%. Therefore, the quantity of online reviews was also manipulated successfully (Petty et al., 1983).

### Hypothesis testing

The descriptive statistics of purchasing intention is summarized in Table 1. The data were submitted to a three-factor ANOVA analysis. The analysis showed a significant main effect of the argument quality [F (1, 250) = 12.406,  $p < 0.001$ ]. In addition, the results indicated a significant main effect of review quantity [F (1, 250) = 6.745,  $p < 0.05$ ]. In other words, the argument quality of online reviews has a positive impact on the purchasing intention of online shoppers. Moreover, the quantity of online reviews has a positive impact on the purchasing intention online consumers. Therefore, hypotheses 1 and 2 were supported.

As predicted by the ELM, the analysis revealed a significant effect of argument quality x involvement interaction [F (1, 250) = 10.958,  $p < 0.001$ ]. Specifically, the main effects of argument quality manipulation and involvement manipulation were qualified by an argument x involvement interaction. The argument quality x involvement interaction suggested that the high-involvement subjects take the central route in formulating purchasing intention (Figure 1A). Simple main effects tests were conducted to further explore the effect. The results revealed that high-involvement subjects expressed more positive attitudes after exposure to the strong argument quality version ( $M = 4.63$ ) than after exposure to the weak argument quality version ( $M = 3.72$ ) of online reviews [F (1, 134) = 22.637,  $p < 0.001$ ], but that attitudes of low-involvement subjects exposed to strong ( $M = 3.96$ ) and weak ( $M = 3.93$ ) argument quality reviews did not differ.

On the other hand, a significant quantity x involvement interaction emerged from the three-factor analysis [F (1,

250) = 5.297,  $p < 0.05$ ]. Specifically, the main effects of review quantity manipulation and involvement manipulation were qualified by a quantity x involvement interaction. This finding was consistent with the ELM prediction. In other words, the quantity x involvement interaction indicated that the low-involvement subjects take the peripheral route in formulating purchasing intention (Figure 1B). Simple main effects tests were conducted to further explore the effect. The results revealed that low-involvement subjects expressed more positive attitudes after exposure to the large quantity version ( $M = 4.26$ ) than after exposure to the small quantity version ( $M = 3.60$ ) of online reviews [F (1, 120) = 12.923,  $p < 0.001$ ], but that attitudes of high-involvement subjects exposed to large ( $M = 4.22$ ) and small ( $M = 4.17$ ) review quantity did not differ.

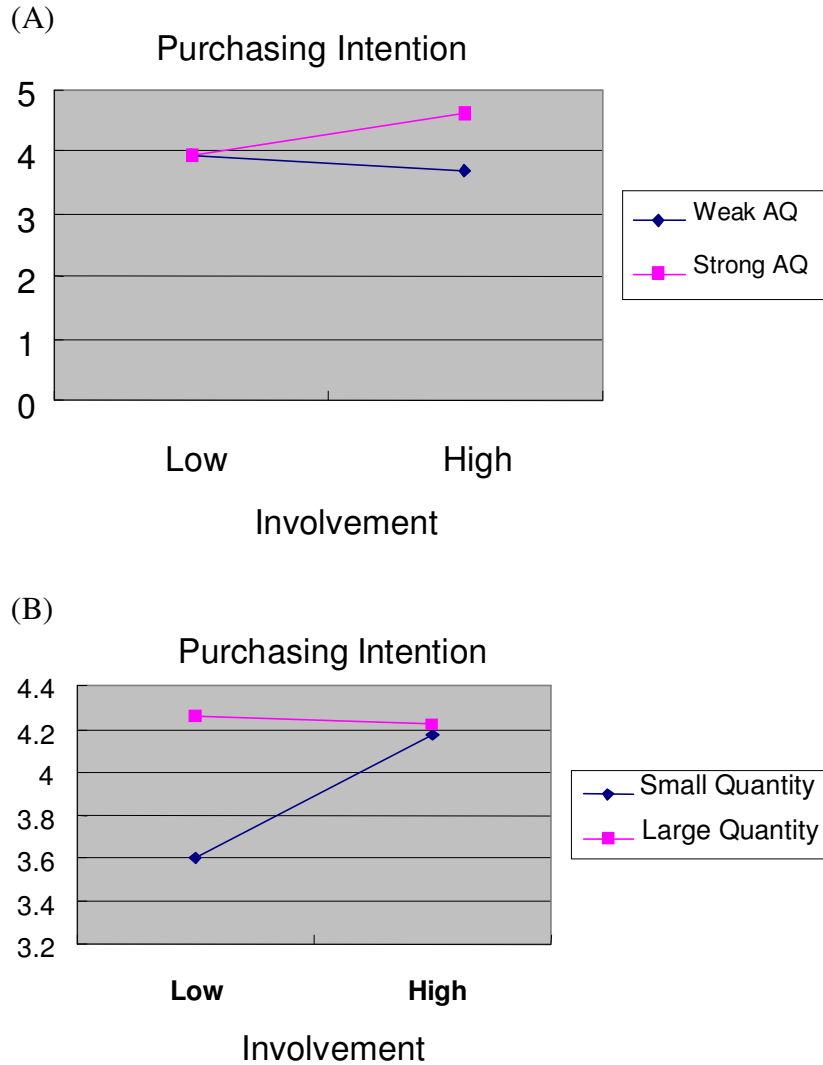
In summary, the purchasing intention of online shoppers under high involvement situation is more influenced by argument quality than quantity of online reviews. In addition, the purchasing intention of online consumers under low involvement situation is more influenced by argument quantity than quality of online reviews. Thus, hypotheses 3 and 4 were supported.

### DISCUSSION

Online review is one of most important communication channels. Research has provided evidence in support of its effects on sales (Mayzlin and Chevalier, 2006). Management of online reviews has been increasingly integrated into marketing communication strategy. The purpose of the present study was to explore the effects of positive online reviews and the mechanisms supporting the effects. Four major findings emerged from an online experimental study. First, the argument quality of online reviews has a positive effect on the purchasing intention of online shoppers. Reviews with strong argument quality are supported with facts and perceived more objective. They are more persuasive than weak quality reviews that are subjective and emotional.

Second, the review quantity positively affects the purchasing intention of online consumers. Specifically, the attitudes of online consumers increase with the number of reviews. Large number of reviews is perceived as an indication of product popularity and hence increases the purchasing intention of consumers.

Third, the main effects of argument quality manipulation



**Figure 1.** AQ x involvement and quantity x involvement interactions for purchasing intention.

and involvement manipulation are qualified by an argument x involvement interaction. People shopping online under high-involvement conditions take the central route in attitude change; that is, they are more influenced by review quality. This finding contributes to the ELM research literature by extending the application of ELM to online consumer behavior. From the central route perspective, marketing managers and online review software developers should carefully consider the right match between the level of consumer elaboration likelihood and the digital presentation of review contents. For example, online consumers wishing to post their reviews for high-involvement audience may be directed to address their opinions in certain designated format to ensure the review quality.

Fourth, consistent with the ELM theory, the main effects of review quantity manipulation and involvement manipu-

lation are qualified by a quantity x involvement interaction. Low-involvement consumers tend to adopt the peripheral route in forming attitudes in an online context; that is, they are more persuaded by online review quantity since more reviews are perceived as higher product popularity. This finding contributes to a better understanding of the mechanism underpinning the effect of online reviews. For marketing executives and software developers, the peripheral route perspective suggests the importance of generating as many reviews as possible for low-involvement audience. For example, a user-friendly interface may simplify the process of posting reviews and thereby increase the participating intention. Incentives such as prize draw can also enhance online shoppers' willingness to post reviews.

The present study deepens our knowledge about the new marketing tool online reviews, as well as contributes

to the ELM literature by testing the theory in an online context. The results indicate that the behaviors of internet users can be explained by the same theory originally developed to explore the real world behaviors. We believe that the ELM approach gives researchers a useful way to better understand the mechanisms by which online consumers develop and maintain attitudes. However, this study is limited because it only examined the moderating role of extrinsic motivation involvement (Haugtvedt et al., 1992). Consumers also differ in personality. Therefore, intrinsic motivation such as need for cognition provides a prospective research area for future researchers.

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