Abstract

Online shoppers are increasingly relying on electronic word-of-mouth (eWOM), which refers to Internet-mediated opinions and recommendations on products and services from experienced consumers, to optimize their purchase decisions and reduce purchase risks. Anchored on the theories of message order effects and information chunking, this research investigates how consumers would process and respond to a large volume of review information provided by an eWOM system. The results from a laboratory experiment revealed that when consumers are interacting with online product reviews chunked by valence, the presentation order can influence their product attitude. More specifically, people high in need for cognition showed a pattern primacy effect while those low in need for cognition a pattern of recency effect. In addition, chunking reviews by valence can also benefit eWOM readers’ short-term memory so that they can recall more product attribute information mentioned in the reviews, in particular, the product attributes covered by the positive reviews. The implications of these findings for practitioners are also discussed.

Keywords: eWOM, primacy effect, recency effect, information chunking, need for cognition, persuasion.
1 INTRODUCTION

Internet is creating an opportunity for consumers to communicate and share their consumption experiences with others. The growing popularity of electronic word-of-mouth (eWOM), which refers to Internet-mediated opinions and recommendations on products and services from experienced consumers (Dellarocas 2003), has important implications for electronic commerce, as prospective consumers can use eWOM to optimize their purchase decisions and reduce purchase risks due to the lack of a contact in online transactions (Awad & Ragowsky 2008; Pavlou & Dimoka 2006).

Along with the wide penetration and significant influences of eWOM, an increasing number of online retailers have deployed eWOM systems, which are Web-based information systems that allow consumers to exchange consumption information and express opinions on the Internet (Dellarocas 2003). As time goes by, the eWOM systems of popular B2C websites start to accumulate a huge number of customer reviews, in particular for their best-selling products. For example, on Amazon.com, there are usually over 500 reviews for a best-selling book and even more for well-liked electronics products such as iPad or Kindle. Challenged by a typical problem of information overload, most consumers are unable to read all reviews about a product. To help consumers process the review information more effectively, a lot of B2C websites have begun to offer some features so that review readers can select which messages to read and in what order. For example, most B2C websites nowadays allow users to choose a sorting criterion of how the reviews are to be displayed. As shown in Figure 1, the reviews can be ordered by date, helpfulness, rating, or reviewer category. In addition, consumers can also categorize reviews by applying certain filters, usually by review valence (i.e., whether the review is in general favorable or unfavorable), so that only a limited portion of all reviews are visible. As shown in Figure 1, customers can apply the review filter to narrow the review messages down to a specific star rating.

Figure 1. The sorting and filtering functions on a eWOM System

The sorting/filtering functions can not only help customers reduce their cognitive load of processing large number of evaluative comments but significantly influence the underlying course of how the eWOM information is being processed. For example, if consumers read reviews in its default order (usually by posting date) and do not apply any filter, they will encounter both positive and negative reviews assorted in a random order. On the other hand, if they sort the reviews by review rating or filter the reviews by star rating or valence, they will read consecutive positive-only or negative-only reviews in a chunk style. Although the features of sorting and filtering have been widely implemented by most eWOM systems, no prior research has thoroughly examined the impacts of information grouping and message order on the cognitive outcomes of consumers’ information processing as well as their attitudinal evaluations towards the product. Based on prior social psychology research on order effects and information chunking, this research attempts to address this void by answering the following research questions:
1) When the eWOM information is chunked (i.e., being grouped into clearly defined segments of opposite valence), can the presentation order of positive and negative reviews influence customer’s product attitude? More interestingly, are such effects moderated by review readers’ need for cognition, as found in previous studies (Haugtvedt & Wegener 1994)?

2) Compared with displaying reviews in a random order, can chunking reviews by valence reduce customers’ cognitive load so as to improve their short-term memory for the product attribute information covered by the reviews? If so, do the chunking effects vary across attribute valence or consumers’ different level of need for cognition?

3) Would chunking reviews by valence ultimately influence consumers’ attitudinal evaluation towards a product?

The findings of this study have both theoretical and managerial contributions. By applying the theories of order effects and information chunking, this research extends our knowledge on consumers’ cognitive responses to eWOM communications and hence contributes to the literatures of both electronic commerce and consumer behavior. In addition, this study examines the differential effects of information chunking on memory and product attitude. These findings will provide online vendors practical guidelines on how to improve the designs and implementations of their eWOM systems, such as whether or not they should group product reviews by valence and whether they should by default show positive reviews before the negative ones or the other way around.

2 LITERATURE REVIEW

2.1 Message Order Effects

The impact of information order on person perception judgment has been first discussed by Asch (1946). Ever since then, it has received wide attention from researchers in a variety of disciplines, including social psychology, law, communication, and marketing. In the field of consumer behavior, researchers have been wondering the extent to which presentation order of conflicting advertisements influences the position adopted by the consumer. That is, although people might encounter information of both sides, the order in which the information is presented might lead people to be more supportive of one side of the issue or the other.

In studying the order effects of opposing messages, researchers tend to focus on two effects of order (Hovland et al. 1957). If people who encounter two opposing messages form judgments more consistent with the first message, a primacy effect has occurred. If the judgment is more consistent with the second (opposing) message, a recency effect is present. Numerous studies have studied the situations under which primacy versus recency effects are likely to occur. Although earlier studies propose that there exists some universal law of primacy effects (e.g., Lund 1925), more studies afterwards had obtained primacy, recency, or null effects in various conditions (Hovland & Mandell 1957). Nowadays, researchers tend to agree that whether primacy or recency effect would prevail is contingent upon a lot of contextual moderators, such as topic characteristics (Lana 1961, 1963), task characteristics, and information processing strategies (Hogarth & Einhorn 1992). By synthesizing past studies of message order according to variables that influence the extent of message processing, Haugtvedt and Wegener (1994) proposed a theoretical framework and summarized that situations that foster high levels of message elaboration lead to primacy effect whereas situations that foster low levels of message relevant elaboration lead to recency effect.

2.2 Information Chunking

In psychology, a chunk is defined as “a collection of elements having strong associations with one another, but weak associations with elements within other chunks” (Gobet et al. 2001, p. 236). It has long been found that people’s short-term memory had a capacity of about "seven plus-or-minus two" chunks (Miller 1956) and, more interestingly, the span of immediate memory seems to be only
relevant to the number of chunks and almost independent of the number of bits per chunk. Miller (1956) has proposed that a person’s short-term memory can be effectively increased for low-information-content items by mentally recoding them into a smaller number of high-information-content items. Sakai et al. (2003) have found that subjects will spontaneously organize a sequence into a number of chunks across few sets, and the performance of a shuffled sequence was poorer when the chunk patterns were disrupted than when the chunk patterns were preserved. The effective application of chunking has also been used to explain several phenomena linked to expertise in chess (Chase & Simon 1973).

3 HYPOTHESES DEVELOPMENT

3.1 Interaction between Order Effect and Need for Cognition

As summarized by Haugtvedt and Wegener (1994), prior research has consistently shown that when presented with two conflicting persuasive messages, people who are highly motivated to think tend to be more influenced by the first than the second message (primacy effect), whereas those low in motivation to think show reduced primacy effects or even recency effects. In a lot of these studies, motivation to think was operationalized in terms of need for cognition (Cacioppo & Petty 1982), which is an assessment of the general tendency for people to engage in and enjoy effortful information-processing activity. For example, through a mock jury study, Kassin et al. (1990) found that people high in need for cognition (i.e., those highly motivated to think) gave verdicts that were more aligned with the initial introduction of the evidence (primacy). In contrast, people low in need for cognition (i.e., those less motivated to think) provided verdicts that agreed more with the second interpretation of the evidence. In another study where need for cognition was used as a surrogate to motivation to think, Ahlering and Parker (1989) found that when receiving eight positive and eight negative trait adjectives about a single person (with all the positive traits either preceding or following all of the negative traits), people who were low in need for cognition were more susceptible to primacy effects than were people who were high in need for cognition.

More recently, Petty et al. (2001) found that information chunking can moderate the impact of motivation to think on order effects in persuasion. In particular, under chunked conditions, people who were highly motivated to think, the break between segments could serve as a signal to stop and consolidate the information just encountered. This consolidation might result in initial attitude formation and the processing of later information in a biased fashion by counter-arguing or dismissing opposing information, which is more likely a primacy effect. By contrast, individuals who are low in motivation to think, the chunking signal between segments would be treated as an alert and therefore briefly increase attention to later information that might otherwise be ignored. As a result, a recency effect is expected.

Based on these findings, we propose that when eWOM reviews are grouped into two chunks (favorable and unfavorable) and the two chunks of messages are presented to readers in a specific order, the presentation sequence will influence their attitude towards the product and such influences will be moderated by the readers’ need for cognition. More specifically, readers with high need for cognition will show a pattern of primacy effect, i.e., they will show a more positive product attitude when the first chunk of information they read is positive than when it is negative. In contrast, readers with low need for cognition will show a pattern of recency effect, i.e., they will show a more positive product attitude when the first chunk of information they read is negative than when it is positive. Thus, we hypothesize

\[ H1: \text{For review readers high in need for cognition, they will show primacy effects (more favorable attitude following a pro/con than a con/pro message sequence); for review readers low in need-for-cognition, they will show recency effects (more favorable attitude following a con/pro than a pro/con message sequence).} \]
3.2 Effects of Chunking on Information Recall

Suppose a B2C website automatically categorizes customer reviews into multiple groups according to review valence or a customer voluntarily applies the features of filtering or sorting by valence, the review messages are blocked into two groups, or are chunked by valence. We expect that chunking a large number of reviews by one of the review’s most diagnostic attributes (i.e., valence) can facilitate the categorization of information and thus reduce the cognitive efforts spent switching between opposing messages, which will in turn lead to the improved performance of review readers’ short-term memory. Therefore, we hypothesize

\( H2a \): Review readers can recall more product attributes from the reviews displayed in a chunking format than from the reviews displayed in a non-chunking format.

The positive effects of information chunking on short-term memory may be different between positive and negative reviews. As repeatedly suggested by prior studies, negative WOMs, compared with positive ones, are considered by consumers as more diagnostic (Herr et al. 1991). Therefore, people tend to put more weight on negative information (Maheswaran & Meyers-Levy 1990; Mittal et al. 1998). When review information is not chunked, review readers are likely to put more of their cognitive efforts on negative reviews and relatively less on positive ones. However, when reviews are chunked into two separate groups, the attributes covered by positive reviews can receive relatively more attention and thus be better processed in short-term memory. Therefore, we hypothesize

\( H2b \): The positive effect of information chunking on attribute recall is more significant for positive reviews than for negative reviews.

The benefits of review chunking on memory may also vary across people with different level of need for cognition. According to Harkins and Petty (1981; 1987), for people with low motivation to think, their message processing could be increased if the arguments were presented in discrete segments from multiple sources rather than a single source. However, for people with high motivation to think, their will likely devote more cognitive efforts to process the review information even when the reviews are presented in a unchunked and random style, which renders the benefits of chunking less significant. Therefore, we hypothesize

\( H2c \): The chunking effects on attribute recall are more significant for review readers low in need for cognition than for those high in need for cognition.

3.3 Effects of Chunking on Product Attitude

As discussed above, we assume that information chunking can help individuals with low need for cognition to recall more positive attributes. On the other hand, if a reviewer’s product attitude is highly contingent upon the numbers of positive and negative attributes she can retrieve from her short-term memory, it is reasonable to expect that, for people with low need for cognition, information chunking will lead to more favorable product attitude than not chunking. However, such effects would be less significant for individuals who have high level of need for cognition, as they will put more cognitive efforts to read all reviews (as long as it is not beyond their cognitive capacity), which is less dependent upon how the reviews are organized. Therefore, we propose the following exploratory hypothesis:

\( H3 \): The chunking effects on product attitude are less significant for consumers high in need for cognition than for those low in need for cognition.
4  RESEARCH METHOD

4.1  Experimental Design

Our experiment took a 3 (review order) × 2 (need for cognition) full-factorial between-subject design, which produced six conditions. Specifically, review order was manipulated with three configurations: 1) positive and negative reviews are chunked and displayed in the pro/con order; 2) positive and negative reviews are chunked and displayed in the con/pro order; and 3) positive and negative reviews are mixed and displayed in random order. Self ratings on the need-for-cognition (NFC) scales were used to classify the subjects into two groups by the conventional median-split method. The high-NFC group had ratings above the median and the low-NFC group had ratings below the median.

4.2  Experimental Stimuli

Three images were designed as simulated screen captures from a eWOM system, which shows either three positive reviews, three negative reviews, or all six reviews (both positive and negative). The screen layout of the images was designed to resemble commercial websites. In the two chunked conditions, participants read two separate images of customer reviews: one with three positive reviews and the other one with three negative reviews. Each image contained only one type of reviews, and a heading at the top of the tab described which type it was (i.e., positive or negative). In the unchunked (random) conditions, participants read reviews that were identical to those read in the chunked conditions. However, the six reviews (both positive and negative) were presented in one single page and sorted in random order (as shown in Figure 2). To avoid distractions and possible confounds due to information other than the selected reviews, we intentionally blurred other zones (such as brand name and price) with Adobe Photoshop filter-glass tools so that only the reviews are clearly visible. Additionally, to avoid the possible confounds due to the decision weight of product attributes mentioned in the customer reviews, another set of three images were created to counterbalance the attribute valence of each review in all conditions.

![Image of “Positive Reviews Only”](image1.png)

![Image of “All Reviews”](image2.png)

Figure 2: Images of “Positive Reviews Only” and “All Reviews”

We selected digital voice recorder as the target product for the experiment, as it is familiar to most of our subjects (university students); therefore, participants can comprehend the review content based on their own experiences.
4.3 Pretests

To ensure the relevance of the review texts, we firstly selected 14 frequently mentioned attributes of digital voice recorders from a large number of actual online product reviews and asked 30 participants to rate the importance of these attributes when making a purchase decision. Based on the descriptive results, six highest-ranked attributes (i.e., appearance, range, fidelity, battery life, storage size, and menu usability) were identified and split into two groups so that there is no significant between-group difference on the combined decision weights (Group A covers the attributes of appearance, fidelity, and storage while Group B covers the attributes of range, battery life, and menu usability).

Six review texts commenting on these six attributes, three favorable for Group A attributes and three unfavorable for Group B attributes, were then composed. Another six reviews with opposite valence (i.e., three unfavorable for Group A attributes and three unfavorable for Group B attributes) were prepared for the counterbalancing conditions. Before the main experiment, we conducted two rounds of pretests to further fine-tune the reviews so that all reviews were rated equally in terms of their comprehensibility, credibility, and vividness. In addition, no significant difference was found between the two opposing reviews for the same attribute on the magnitude of perceived polarity.

4.4 Measurement Scales

*Independent variable.* The complete 34-item need for cognition (NFC) scale (Cacioppo & Petty 1982) was used to assess the degree to which each subject enjoyed the process of thinking. The NFC scale was administered after the subjects had completed the questionnaire containing the dependent measures, a procedure similar to that used by Haugtvedt and Petty (1992).

*Dependent variables.* Product attitude was measured with a 4-item 7-point semantic differential scale (Batra & Ray 1986). Attributes recall was operationalized as the number of positive and negative product attributes a subject could correctly recollect after reading all reviews (range from 0 to 3 respectively).

*Control variables.* Two control variables, namely participants’ general attitude toward eWOM (Park et al. 2007) and product knowledge (Flynn & Goldsmith 1999) were also measured.

All measurement items are listed in Appendix A.

4.5 Participants and Experimental Procedures

Through campus advertisement, 108 undergraduate and graduates students at a major public university were recruited in exchange for a cash reward. The experiment was conducted in a computer lab. All experiment instructions, stimuli, and questionnaire were stored and presented through a self-administrated online survey system. Participants were randomly assigned to one of the three experimental conditions. To help subjects getting oriented with the survey system, a research assistant first asked them to complete an online questionnaire for their background information. They were then instructed that they were about to read some online product reviews on a digital voice recorder for a fictitious shopping task. They were told that some screenshots captured from a real-world eWOM system would be presented to them and they would read a few randomly-selected customer reviews. In the two chunked conditions, subjects can only browse the two images in the specified order. After reading the reviews, subjects were asked to complete a questionnaire containing the measures of product attitude and need for cognitions as well as the attribute-recall questions. Once starting the questionnaire, they could not refer back to the stimulus images. Upon the completion of the questionnaire, subjects were debriefed, thanked, and dismissed.

5 RESULTS
We first checked the manipulation of subject’s need for cognition. The results indicated that, after the median split, the NFC score of the high NFC group is significantly higher than that of the low NFC group (5.08 vs. 4.14 in a 7-point scale, \( p < 0.001 \)). The reliability of our constructs was then examined. As reported in Appendix A, Cronbach’s alpha reliability coefficients of all constructs exceed the threshold value of 0.7 (Nunnally 1978). Group means and standard deviations of dependent variables are reported in Table 1.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Product Attitude</th>
<th>Attribute Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (sd)</td>
<td>Positive Mean (sd)</td>
</tr>
<tr>
<td>Low NFC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chunking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pro / con</td>
<td>4.05 (1.11)</td>
<td>2.16 (0.96)</td>
</tr>
<tr>
<td>con / pro</td>
<td>4.28 (0.93)</td>
<td>2.56 (0.73)</td>
</tr>
<tr>
<td>total</td>
<td>4.16 (1.02)</td>
<td>2.34 (0.87)</td>
</tr>
<tr>
<td>Random</td>
<td>4.82 (0.93)</td>
<td>1.53 (0.61)</td>
</tr>
<tr>
<td>High NFC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chunking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pro / con</td>
<td>4.53 (0.95)</td>
<td>1.94 (0.90)</td>
</tr>
<tr>
<td>con / pro</td>
<td>3.90 (0.95)</td>
<td>2.45 (0.83)</td>
</tr>
<tr>
<td>total</td>
<td>4.19 (0.99)</td>
<td>2.22 (0.89)</td>
</tr>
<tr>
<td>Random</td>
<td>4.01 (1.22)</td>
<td>1.65 (1.00)</td>
</tr>
</tbody>
</table>

*Table 1: Descriptive statistics*

ANOVA was then used to test hypotheses. As shown in Table 2, when using the data of two chunking groups (i.e., the pro/con and con/pro groups) and after controlling for participants’ general attitude toward eWOM and product knowledge, there is significant interaction between need for cognition and order (\( F(1, 66) = 4.37, p < 0.05 \)). As illustrated in Figure 3, for subjects with low NFC, their product attitude in the pro/con order is lower than those in the con/pro order, suggesting a recency effect; for those with high NFC, the pro/con group reported a higher score than the con/pro group, suggesting a primacy effect. Therefore, H1 is supported.

<table>
<thead>
<tr>
<th></th>
<th>( F )</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for Cognition</td>
<td>0.144</td>
<td>0.706</td>
</tr>
<tr>
<td>Order</td>
<td>0.380</td>
<td>0.540</td>
</tr>
<tr>
<td>Need for Cognition ( \times ) Order</td>
<td><strong>4.366</strong></td>
<td><strong>0.041</strong></td>
</tr>
<tr>
<td>Covariate: General Attitude towards eWOM</td>
<td>6.137</td>
<td>0.016</td>
</tr>
<tr>
<td>Covariate: Product Knowledge</td>
<td>0.630</td>
<td>0.430</td>
</tr>
</tbody>
</table>

*Table 2: ANCOVA results on product attitude*
The ANCOVA results on attribute recall are reported in Table 3. The main effect of chunking is significant ($F(1, 102) = 11.88, p < 0.01$), suggesting that, in general, grouping information by valence can help subjects process information more effectively and facilitate their short-term memory; therefore, our H2a is supported. Meanwhile, the interaction between attribute valence and chunking is also significant ($F(1, 102) = 6.35, p < 0.05$). Specifically, as illustrated in Figure 4, when reviews are chunked, attributes covered by positive reviews can be significantly better recalled than when they are randomly mixed with negative reviews; however, such effect is not significant for attributes mentioned in negative reviews. As a result, our H2b is supported. On the other hand, the results revealed no significant interaction effect between need for cognition and chunking ($F(1, 102) = 1.99, p > 0.05$). Thus, H2c is not supported.

<table>
<thead>
<tr>
<th></th>
<th>$F$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute Valence</td>
<td>.181</td>
<td>0.672</td>
</tr>
<tr>
<td>Chunking</td>
<td>11.877</td>
<td>0.001</td>
</tr>
<tr>
<td>Need for Cognition</td>
<td>.317</td>
<td>0.574</td>
</tr>
<tr>
<td>Need for Cognition × Chunking</td>
<td>1.988</td>
<td>0.162</td>
</tr>
<tr>
<td>Need for Cognition × Attribute Valence</td>
<td>0.352</td>
<td>0.554</td>
</tr>
<tr>
<td>Attribute Valence × Chunking</td>
<td>6.346</td>
<td>0.013</td>
</tr>
<tr>
<td>Need for Cognition × Attribute Valence × Chunking</td>
<td>0.111</td>
<td>0.740</td>
</tr>
<tr>
<td>Covariate: General Attitude towards eWOM</td>
<td>0.890</td>
<td>0.348</td>
</tr>
<tr>
<td>Covariate: Product Knowledge</td>
<td>0.085</td>
<td>0.771</td>
</tr>
</tbody>
</table>

Table 2: ANCOVA results on attribute recall
Lastly, the effects of information chunking and need for cognition on product attitude were examined. ANCOVA results revealed that the interaction between chunking and need for cognition is marginally significant ($F (1, 102) = 3.86, p = 0.052$). However, as shown in Figure 5, information chunking does not change the attitude of subjects with high need for cognition but significantly decrease the attitude of those with low need for cognition, which is to the contrary of our expectation. Therefore, our H3 is not supported.

6 CONCLUSIONS

6.1 Discussion of Results

To summarize, the results of this study revealed that when consumers are interacting with online product reviews chunked by valence, the presentation order can influence their product attitude. More importantly, such influences are moderated by their motivation to think. More specifically, people high in need for cognition showed a pattern primacy effect while those low in need for cognition a pattern of recency effect. Even though such interactions have been found in other fields such as psychology, it is probably the first time that it has been empirically examined in the context of eWOM. More importantly, the findings have important design implications for practitioners. If a B2C website could differentiate its users into “casual browsers” and “serious shoppers” with the help of analyzing their online activities, it can probably adjust the presentation order of the chunked reviews accordingly so that the review readers can form a more positive attitude towards a product.

Secondly, our study provided concrete evidence for the benefits of information chunking. Our results showed that chunking reviews by valence can help customers expand their short-term memory effectively so that they will remember more information mentioned in the reviews. More importantly, it’s the positive reviews that can get more significant boost. These results strongly suggest that eWOM system designers should implement the feature of chunking as a default setup. If consumers are facilitated to read both positive and negative reviews in such a chunked style, it might effectively neutralize the effect of negative bias, a widely noted phenomenon that negative reviews have disproportionally more powerful influences than positive reviews.

Thirdly, our hypothesis about the interaction effect between need for cognition and information chunking on attribute recall is not supported. The insignificant result could be possibly attributed to the study’s limited statistic power due to its relatively small sample size. Meanwhile, it might also be explained by the ceiling effect: as only six reviews (three positive and three negative) were used in the experiment; therefore, the cognitive load was not very constraining even for subjects low in need for...
cognition, which rendered the effects of chunking less significant. Future research should reexamine this hypothesis by using a larger sample and more information-intensive reviews.

Lastly, our hypothesis about the interaction effect between need for cognition and information chunking on product attitude is not supported. Our findings may suggest that people’s attitude towards the product can be influenced by multiple factors other than the product information recalled from their short-term memory, as suggested by Rottenstreich et al. (2007). More intriguingly, for people low in need for cognition, they reported a lower score of product attitude when the review messages were chunked than unchunked, even though they could recall more positive product attributes from chunked reviews. Some other mediating factors, such as review credibility and diagnosticity, may have exerted larger effects on the formation of product attitude.

### 6.2 Limitations and Future Research

This research also has some limitations. Firstly, the effects of information chunking may have influenced other cognitive outcomes of review readers’ information processing, such as their perceptions of the reviews’ diagnosticity and credibility, which might be better predictors of product attitude than attribute recall. Future research should consider measuring these mediating variables. Secondly, other moderators, such as subjects’ prior brand attitude (Chattopadhay & Basu 1990), may have also influenced the hypothesized effects of information chunking and presentation order. Lastly, our findings may be artificially constrained by the choice of the product. In this research we selected digital voice recorders to test hypotheses due to its familiarity to experiment participants. According to Park and Lee (2009), however, the influence mechanism of eWOM would vary across different product categories, such as search products versus experience products. As such, future research can employ more products to explore the moderating role of product category.

### Acknowledgements

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Appendix A. Measurement Items

- Product attitude (Cronbach’s Alpha = 0.952)
  What do you think about this digital voice recorder?
  1. Good --- Bad
  2. Like --- Dislike
  3. Pleasant --- Unpleasant
  4. Favorable --- Unfavorable
bullet General Attitude toward eWOM (Cronbach’s Alpha = 0.725)
1. When I buy a product, the reviews presented on the Internet are helpful for my decision making.
2. When I buy a product, the reviews presented on the Internet make me confident in purchasing the product.
3. If I do not read the reviews presented on the Internet when I buy a product, I worry about my decision.

bullet Product Knowledge (Cronbach’s Alpha = 0.790)
1. I know pretty much about digital voice recorders.
2. Among my circle of friends, I’m one of the “experts” on digital voice recorders.
3. I do not feel very knowledgeable about digital voice recorders.

bullet Need for Cognition (Cronbach’s Alpha = 0.877)
1. I really enjoy a task that involves coming up with new solutions to problems.
2. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
3. I tend to set goals that can be accomplished only by expending considerable mental effort.
4. I am usually tempted to put more thought into a task than the job minimally requires.
5. Learning new ways to think doesn't excite me very much.
6. I am hesitant about making important decisions after thinking about them.
7. I usually end up deliberating about issues even when they do not affect me personally.
8. I prefer just to let things happen rather than try to understand why they turned out that way.
9. I have difficulty thinking in new and unfamiliar situations.
10. The idea of relying on thought to make my way to the top does not appeal to me.
11. The notion of thinking abstractly is not appealing to me.
12. I am an intellectual.
13. I only think as hard as I have to.
14. I don’t reason well under pressure.
15. I like tasks that require little thought once I’ve learned them.
16. I prefer to think about small, daily projects to long-term ones.
17. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
18. I find little satisfaction in deliberating hard and for long hours.
19. I more often talk with other people about the reasons for and possible solutions to international problems than about gossip or tidbits of what famous people are doing.
20. These days, I see little chance for performing well, even in “intellectual” jobs, unless one knows the right people.
21. More often than not, more thinking just leads to more errors.
22. I don't like to have the responsibility of handling a situation that requires a lot of thinking.
23. I appreciate opportunities to discover the strengths and weaknesses of my own reasoning.
24. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
25. Thinking is not my idea of fun.
26. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
27. I prefer watching educational to entertainment programs.
28. I think it best when those around me are very intelligent.
29. I prefer my life to be filled with puzzles that I must solve.
30. I would prefer complex to simple problems.
31. Simply knowing the answer rather than understanding the reasons for the answer to a problem is fine with me.
32. It’s enough for me that something gets the job done; I don’t care how or why it works.
33. Ignorance is bliss.
34. I enjoy thinking about an issue even when the results of my thought will have no effect on the outcome of the issue.