



## How Does the Presentation Mode of Product Information Affect Product Evaluation? : The Mediation of Construal Level and the Moderation of Response Time

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# How Does the Presentation Mode of Product Information Affect Product Evaluation? : The Mediation of Construal Level and the Moderation of Response Time

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**Abstract:** The purpose of this study was to examine how the presentation mode (sequential- vs. simultaneous-mode) of information influences its evaluation. Three experiments revealed the interaction effect between the presentation mode and the valence of the product information. When respondents read about the positive aspects of the product, the evaluation was higher in the simultaneous presentation mode than in the sequential presentation mode. For negative product information, respondents' evaluation was higher in the sequential presentation mode than in the simultaneous presentation mode. The simultaneous presentation mode intensified the impact of the information valence on evaluation. This study proposed that the sequential and the simultaneous presentation modes prime high and low construal levels, respectively. The mediation analysis provides support for such a prediction. Finally, the mediating effect of construal levels in evaluation was shown to disappear when respondents focused on the product information for a longer duration, while the mediation effect remained when the response time was short.

**Keywords:** presentation mode; construal levels; product evaluation; response time

## 1. Introduction

Imagine that there are sets of good news and bad news. Good news may include pleasant events such as getting an A grade in class, being promoted, or winning a lottery. Bad news could be in the form of some disappointing events like getting a C grade in class, being demoted, or missing an important deadline for a grant proposal. Would it be better to hear a set of such good news together on the same day rather than on separately on different days? What about for bad news? The research question that this study attempts to answer is related to such examples of positive and negative information, and the optimal manner in which they should be presented.

Existing studies have described how preference changes depending on whether the judgment occurs in joint or separate condition [1] or how the choice satisfaction differs by the way the options are presented [2]. For example, reference [2] found that people are more satisfied with the option that they have chosen when it is chosen from simultaneously than sequentially presented options because people might have expected to be presented with a better option through the course of sequential presentation. Such expectation or hope could have reduced their choice satisfaction. In contrast, when the options are simultaneously presented together it is less likely that the emotion of hope affects the decision making, thus generating greater choice satisfaction compared to sequential presentation mode. Another study on presentation mode showed that the attractiveness of the option is compromised in joint evaluation mode [3]. The purpose of the current study is to examine whether the way information or advertisement message is presented would affect the evaluation of the product that is associated with this information. Previous researchers have examined how presentation modes influence preference for different options. In contrast, my investigation examines the influence of presentation mode on evaluation of valenced attribute information. While previous studies have investigated the pattern of preference change among various options, the present study is focused on how attribute presentation influences preference for a singular option. This study proposes construal-level as an underlying mechanism through which

presentation mode affects evaluation. Specifically, I predicted that two different modes of presentation will prime differing levels of construal in mind, which thus affect evaluation.

## 2. Theoretical Background

### 2.1 Presentation Effects in Judgment

Procedure invariance is a crucial axiom of rational choice, which asserts that “strategically equivalent methods of elicitation will give rise to the same preference order” [4] (p. 185). This axiom would imply that the relative preference between two options should remain unaltered no matter how they are presented. But several exceptions to this rule have been recorded in the decision-making literature.

One’s preference changes depending on the different modes of presenting two options [1, 3, 5, 6]. Reference [1] showed that when each option was presented separately, selection was disproportionately based on the attributes of options that are relatively easy to evaluate independently (typically categorical rather than continuous). In contrast, when the options were presented jointly, selection was based more on “comparative attributes,” which are typically continuous rather than categorical. Such contingent reliance on attributes leads to preference reversal. Reference [3] found that joint evaluation mode hurts the attractiveness of the focal option if it is already attractive relative to the reference point in separate evaluations, because of comparisons across the options. These findings confirm that decision-making is strongly affected by the way the options are presented. Such preference shifts because of the joint-versus-separate evaluation of options have been documented in various contexts including consumers’ product choices [6], compensations, and job offers [5].

The other set of presentation effect studies include sequential-versus-simultaneous presentation mode and its impact on choice satisfaction [2] and the extent to which individuals make rational decision [7]. Reference [2] demonstrated that sequential rather than simultaneous presentation mode is deleterious to choosers’ satisfaction since participants in the sequential condition hoped for an idealized option to become available later, while those in the simultaneous condition focused on a given set of options without hoping for a better option. Therefore, simultaneous presentation mode enhances satisfaction with the option that is chosen. Reference [7] showed that simultaneous (vs. sequential) presentation encourages an optimal choice. In sum, the way options are presented affects our decisions.

The present study examines the impact of the mode of product information presentation on product evaluations. This study suggests that positive (vs. negative) information about a product should be presented together (vs. separately) to enhance the product evaluation. Also, this study proposes that such a difference occurs due to differing construal levels, which are generated from different modes of presentation.

### 2.2 Mediating Role of Construal Level in the Impact of Presentation Mode on Evaluation

Construal-level theory [8] suggests that our decision-making process is systematically affected by how events are construed. When the event is construed to a psychologically distant (vs. close) or a high (vs. low) level, decision-making process is likely to be more abstract (vs. concrete) in nature. Psychologically distant events or stimuli are construed in terms of primary, simple, and abstract features. In contrast, psychologically proximal events are more likely to be construed in terms of subordinate, specific, and contextual features that entail concrete information. Low construal levels are related more to analytical processes while high construal levels appear to generate a more holistic thinking style.

Such different thinking styles seem to be related to the way information is presented. For example, when we process one piece of information at a time, it is easy to determine its main message without deeply scrutinizing it. In contrast, processing several pieces of information at the same time requires more cognitive resources, so a more analytical thinking style is required to determine its core message. Sequential presentation mode is less likely to require an analytical thinking style compared to simultaneous presentation mode. Thus, the current study suggests that sequentially and simultaneously presented information is likely to encourage holistic and analytical thinking styles, respectively. As holistic and analytical processing is characteristic of high and low construal levels, respectively [9], I predict that information presented sequentially (vs. simultaneously) would be construed to relatively high- (vs. low) level. The following section describes the role of construal levels in detail.

#### 2.2.1 Presentation mode and construal level.

Presentation mode is expected to prime differing psychological distances. Previous studies have demonstrated that high or low construal can be primed through various methods, such as asking participants to describe “why” or “how” they engage in an action [10, 11] and manipulating the distance between a target and individuals on various psychological dimensions including time [8, 12]. This study predicts that presentation mode could also activate different levels of construal.

To evaluate the product based on the information given, it is necessary to create a general impression of the product from the given information. If the information is perceived as delivering positive (vs. negative) aspects of the product, the evaluation of the product would be favorable (vs. unfavorable). When we receive only one piece of information about the product, it is relatively easy to grasp the key message it attempts to deliver, without being interrupted by other information, which encourages holistic process. When a set of information is presented simultaneously it would be relatively complicated to figure out what the key message is since we may undergo a more analytical process by analyzing each piece of information and comparing one piece to others. Sequential (vs. simultaneous) presentation mode thus appears to encourage the holistic (vs. analytical) process, which is one of the characteristics of high- (vs. low-) level construal.

This reasoning is supported from existing literature on alternative- versus attribute-based evaluation [13-16]. Sequential presentation requires more alternative-based evaluation, while simultaneous presentation encourages more attribute-based evaluation [15]. Evaluating each alternative one at a time seems to encourage people to evaluate it in a more holistic manner, which occurs in a high-construal mindset. Evaluating several different attributes side by side requires people to evaluate them in a more concrete manner, which occurs in a low-construal mindset. Also, most of the things that are known to evoke alternative-based processing are strongly associated with a high construal level. For example, time priming was shown to elicit an alternative-based evaluation strategy that facilitates holistic processing [16], and the concept of time (vs. money) activated a more abstract (vs. concrete) mindset [13]. Research on the relationship between regulatory focus and information processing have also shown that alternative- and attribute-based evaluation is related to high- and low-construal levels, respectively. For example, promotion focus fits a global processing style, while prevention focus fits a local one [12], and each of them facilitates alternative- and attribute-based processing [17], respectively. Also, promotion focus tends to be work for temporally distant goals, while prevention focus tends to work for temporally close goals [14]. Overall, findings from existing literature indicate that alternative- (vs. attribute-) based processing should be associated with more holistic (vs. analytical) and global (vs. local) processing, which is associated with high- (vs. low-) level construal. As sequential (vs. simultaneous) presentation mode encourages alternative- (vs. attribute-) based evaluation, it can be inferred that sequential (vs. simultaneous) presentation mode is associated with a high- (vs. low-) construal mindset.

More processing effort in simultaneous presentation mode also could be supported by previous studies on joint versus separate evaluation. They showed that options presented jointly are likely to facilitate processes of comparison [3, 18], which requires more cognitive effort than when each item is presented separately. Several studies have shown that such cognitively effortful processes cause a depletion in cognitive resource, which is strongly linked to lower-level construal [19, 20]. For example, in their experiment, reference [19] showed that those who were assigned to a self-regulation condition formed more groups in a categorization task. Categorization tasks ask people to assess the extent to which the items typically belong to the given category. A greater number of typical items in the category indicates higher level construal. People in a psychologically distant state form relatively fewer groups than those who are in a psychologically close state [21]. Overall, due to the cognitive load in processing the information, simultaneous presentation mode is expected to generate low-level construal, while sequential presentation mode, which is less likely to cause resource depletion, would activate high-level construal.

### 2.2.2 Construal level and evaluation

The present study predicts that a low construal-level state that is induced in simultaneous presentation mode will increase the perceived intensity of the valence (either positive or negative) of the information, thus leading to a more polarized evaluation such that positive (vs. negative) product information generates a more favorable (vs. unfavorable) product evaluation under low-level construal than under a high-level construal state. Under a high-level construal state, people will focus on the core message that the given information delivers, which is the primary feature of the product. In contrast, under a low-level construal state, people will process information in a more concrete manner, which may enable them to determine the emotional valence of the

information as well as its key message. Accordingly, people in a low construal-level state would feel how positive or negative the message is more vividly than those in a high construal-level state. Given that the affect is generally considered to be concrete and visceral [22, 23], the prediction that the impact of the emotional valence on evaluation will be stronger in a low rather than a high construal-level state seems to make sense.

The attitude polarization in low-level construal has been shown in previous studies. One of the studies suggested that greater abstraction reduces polarization in attitude formation and subsequent behavior [24]. Reference [24] showed that politically polarized attitudes in the face of controversial issues were reduced by priming respondents to a high-level construal. Also, when valenced information was presented, lower construal levels led to more extreme attitudes [25]. These results suggest that the difference between a product rating based on positive and negative product information will be greater under a low- rather than a high-level construal state.

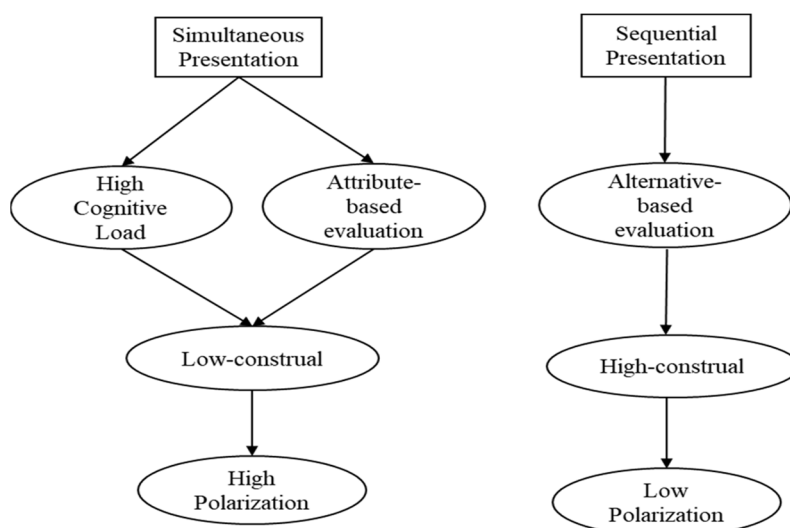
Research suggesting that evaluation is more emotionally charged in lower construal levels also supports this prediction [26, 27]. Reference [26] found that the temporal proximity of the events, which corresponds to low construal levels, leads to greater preferences for affectively superior options. Another study by reference [27] showed that participants who described the events emotionally perceived the events as relatively more psychologically close than those who described the events neutrally. This being the case, the valence of information is likely to strongly impact preferences at low construal levels. Accordingly, each of the valences will be intensified such that a positive set of information would be perceived as being more positive, while negative aspects would be perceived even more undesirably when respondents are primed to low- than high-level construal. Based on this reasoning, the following hypotheses were established. Figure 1 summarizes the theoretical framework of the present study.

Hypothesis 1: The impact of presentation mode of information on evaluation will be moderated by the valence of that information. For positive (vs. negative) information, evaluation will be more favorable when it is presented simultaneously (vs. sequentially).

Hypothesis 2: Differing levels of construal will mediate the relationship between presentation mode and evaluation.

H2a: Different presentation modes will generate differing levels of construal. Specifically, sequential (vs. simultaneous) presentation mode of information will generate high (vs. low) construal levels.

H2b: The difference between product ratings based on positive and negative product information will be greater when participants are primed to low- than high-level construal.



**Figure 1.** Theoretical Framework

### 2.3 The Moderating Role of Response Time

This study proposes response time as the moderating variable such that the mediating role of construal level depends on how long people take to respond. Response time reflects the extent to which people deliberate

before making a decision [28]. Since analytical operations and correct responses require a longer response time than does heuristic and automatic processing [29], as the response time becomes longer, the probability of correct responses increases [29], while faster response is related to decision-making biases and errors [28]. Thus, deliberation helps people take a stable and correct view on a stimulus that would otherwise be distracted by temporary contextual factors. While presentation mode and construal levels are such externally induced, temporary contextual factors, response time may reflect individual differences in tendency to deliberate. This study predicts that deliberation will mitigate the impact of presentation mode and construal levels in evaluation. In other words, polarization in evaluation in simultaneous presentation mode will be mitigated for those who deliberate on the information.

It is natural to distinguish what is positive from negative. If such ability is strengthened or weakened under certain circumstances, it is an irregularity. Longer response times may be the solution for resolving the odd situation and going back to a normative state, because those who spend a longer time responding to the product information would not be affected by construal levels, and they will show normative levels of detecting the difference between positive and negative information regardless of presentation mode and construal level. Figure 2 illustrates Hypothesis 3.

Hypothesis 3: Response time will moderate the mediating role of construal levels in the relationship between presentation mode and evaluation. Specifically, the mediation of construal levels will be mitigated when response time is longer than when it is shorter.

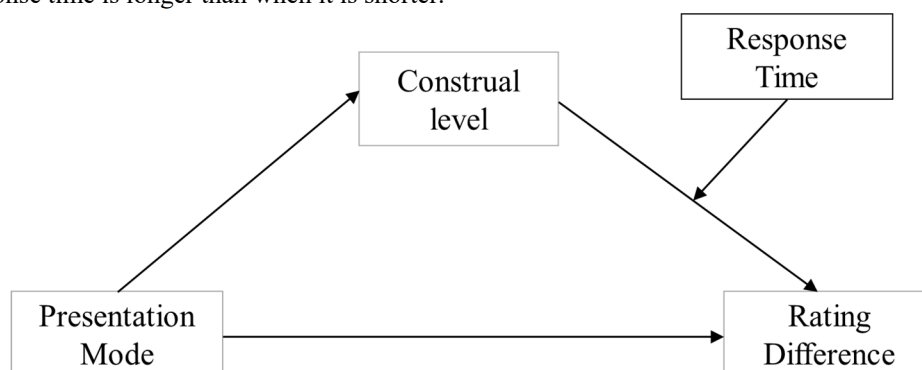


Figure 2. Framework of Hypothesis 3

### 3. Pretest for Valence Assessment

I created three positive and three negative aspects for each of three products that I used as the experimental stimuli. To assess whether each information was indeed perceived as positive or negative, I conducted a brief pre-study with 150 participants who volunteered to participate through Amazon Mechanical Turk. Respondents were randomly assigned to either positive or negative information condition, and rated the extent to which they feel that the information is positive or negative on a 5-point Likert scale, 1 being “very negative” and 5 being “very positive.” For all three products, there was a significant difference in rating between positive and negative information. Participants could distinguish the positive information from the negative. Average rating scores for all stimuli is summarized in Table 1.

Table 1. Average ratings for product information

Product	Valence	Mean (SD)
Restaurant	Positive	4.31 (.47)
	Negative	2.50 (.70)
Coffee Maker	Positive	4.24 (.46)
	Negative	2.04 (.67)
Tablet PC	Positive	4.48 (.45)
	Negative	1.84 (.70)

### 4. Study 1: Interaction between Presentation Mode and Information Valence

#### 4.1 Method

Study 1 used a 2 x 2 between-subject design (presentation mode: sequential vs. simultaneous; valence of the information: positive vs. negative), and 303 participants who volunteered to participate through Amazon Mechanical Turk completed the experiment. They were randomly assigned to one of four conditions. The experimental stimuli were three positive (e.g., ‘Cozy atmosphere provides customers with more enjoyment. This restaurant is decorated with nice pictures and comfortable furniture and filled with easy-listening music’.) and three negative aspects (e.g., ‘‘Since parking spaces are limited you may use meter parking near the restaurant after 6 pm’’) of a restaurant, which are adapted from the stimuli developed by [30].

Participants first read the instruction on the screen explaining the purpose of the study, and were then presented with the product information. In sequential presentation mode, participants were presented each of the three descriptions of the restaurant one at a time on separate computer screens, while participants in simultaneous condition read all three pieces of information together on a single screen. Specifically, in sequential presentation mode, after piece of each information, participants were asked to rate it, which generated three evaluation scores. In simultaneous presentation mode, respondents evaluated the information only once after they read it all. The reason for inserting the evaluation questions after each piece of information in sequential presentation mode was to reinforce the ‘‘separateness’’ of the presented information. If rating occurred only once after all the information had been presented, as in simultaneous presentation mode, participants were liable to read them hastily, thereby simulating a simultaneous presentation mode. After the information was presented, participants were asked to evaluate the attractiveness of and willingness to visit (WTV) the restaurant within a month on a 7-point Likert scale, with 1 being ‘‘very unattractive’’ or ‘‘very unlikely’’ and 7 being ‘‘very attractive’’ or ‘‘very likely.’’ Attractiveness and WTV ratings were averaged to create a composite score for evaluation, which served as a dependent measure.

#### 4.2 Results and Discussion

A 2 x 2 ANOVA (presentation mode: sequential vs. simultaneous; valence of the information: positive vs. negative) produced a significant interaction effect between presentation mode and the valence of the information ( $F(1, 299) = 6.74, p = .02$ , see Figure 3), supporting Hypothesis 1. An independent sample t-tests showed that the average rating for the restaurant based on positive information was significantly greater in simultaneous ( $M = 5.65, SD = .83$ ) than in sequential ( $M = 5.19, SD = .86$ ) presentation mode ( $t(148) = 2.88, p = .01$ ). Although there was no significant difference in average rating between two presentation modes when participants evaluated the product based on negative information ( $t(151) = -.51, p = .61$ ), Hypothesis 1 was directionally supported such that negative information was perceived as less adverse in sequential ( $M = 3.20, SD = 1.18$ ) rather than in simultaneous ( $M = 3.07, SD = 1.75$ ) conditions. In other words, simultaneous and sequential presentation is better for positive and negative information, respectively.

This study shows that simultaneous presentation mode intensifies the impact of the valence of product information on evaluation, and the result seems to suggest that people distinguish positive information from negative one more effectively when the information is presented simultaneously than sequentially.

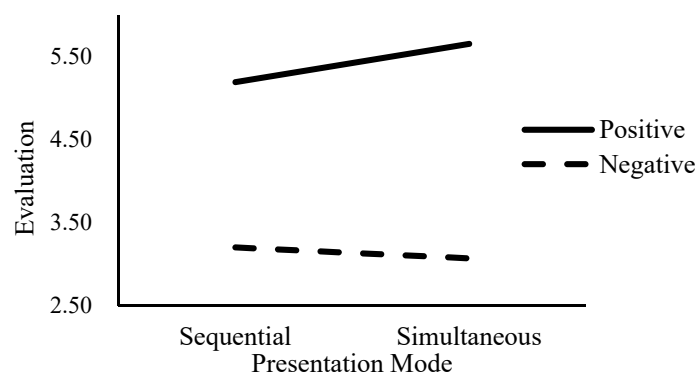


Figure 3. Result of Study1

While the first study supports the main theoretical conjecture, the experimental setting would cast some doubt because participants in sequential presentation mode rated each piece of information three times, while the simultaneous presentation condition asked participants to rate the product only once. Such a difference in number of rating would raise a problem: if the sequential condition also had asked participants to evaluate the product only once as simultaneous condition did, participants would have had to try to memorize the previous information to provide an overall evaluation of the product. In contrast, participants in the simultaneous condition might not have tried to recall them since they received all information at the same time. If this is the case, sequential presentation mode also would have required as much cognitive resources as in simultaneous condition, which would have also generated low construal level. Thus, one may argue that if the number of evaluations is kept constant, the results would not be replicated. Study 2 was designed to address this very issue. Participants in both conditions rated the product once only.

In addition, the way information was presented in sequential presentation mode was changed. The setting in the first study required participants to read each piece of information once. Thus, it was not likely that ratings for the current information would be affected by previous information. In contrast, in the simultaneous presentation mode there was a possibility that participants' evaluations might have changed as they read the information. If such an unconscious influence of previous information on new information is controlled, would the same result still be observed? Study 2 is designed to show that the result obtained in Study 1 was not because previous information might have affected the process of the next one, but was due to the presentation mode per se. In sequential presentation condition, the information was presented in a cumulative manner. Participants read the first page, and as they moved to the next page on the screen, the second information was presented along with the first one so that participants would be affected by the first information unconsciously in both presentation modes. If the new result continues to replicate the result from the previous experiment, then the finding can be attributed to the different presentation mode, not to other factors such as number of ratings or unconscious influences from previous information.

## 5. Study 2: Replication in Different Settings

### 5.1 Method

In this study, 200 undergraduate students completed the experiment in exchange for credit. Experimental design and procedure were the same as in Study 1 except for the way information was presented in sequential condition. In the sequential presentation condition, information was presented cumulatively as they moved to the next page. The first piece of product information was presented on the first page on the screen, then the second piece was presented along with the first one, and finally, all three pieces of information were presented simultaneously. Unlike the Study 1 participants rated the product only after they read all the information, rather than evaluating them three times. Participants rated willingness to buy (WTB) and attractiveness of a product on a 7-point Likert scale, with 1 being "very unlikely" or "very unattractive" and 7 being "very likely" or "very attractive". WTB and attractiveness ratings were averaged to create a composite score for evaluation that was served as a dependent measure.

The stimuli were adapted from appliance section on the Consumer Reports website. I employed some of the information about the coffee maker as described on the website and consumer reviews attached to several coffee makers. Based on that, three positive (e.g., "This coffeemaker is perfect for everyday drinkers like me. I drink at least a cup of coffee every morning while I prepare for going to work. It is easy to use and brews very quickly. It takes approximately around 5 minutes to brew, which taste awesome and the coffee is hot enough to enjoy even after several cups".) and three negative reviews (e.g., "This coffeemaker is very hard to use due to too many menus and functions, and I could not understand product usage guide. The guide is too short to understand for the customers like me who have not frequently used coffeemakers before. Also, the reservoir is difficult to remove, reinstall, and clean".) of the coffee maker were created.

### 5.2 Results and Discussion

A 2 x 2 ANOVA (presentation mode: sequential vs. simultaneous; valence of the information: positive vs. negative) produced a significant interaction effect between presentation mode and valence ( $F(1, 196) = 9.95, p < .01$ , see Figure 4), replicating the initial finding with a different stimuli and in a different experimental setting.



In positive review conditions, average ratings for the coffee maker were significantly greater ( $t(98) = 3.38, p = .001$ ) in simultaneous mode ( $M = 5.82, SD = 1.08$ ) than in sequential presentation mode ( $M = 5.02, SD = 1.26$ ). In contrast, participants evaluated the coffee maker less favorably when negative customer reviews were presented simultaneously ( $M = 1.95, SD = 1.29$ ) rather than sequentially ( $M = 2.28, SD = 1.40$ ), although the difference in rating was not significant ( $t(98) = -1.23, p = .22$ ). The impact of presentation mode on product evaluation was significant when positive reviews were presented, but not when negative reviews were presented. However, directionally, the results support Hypothesis 1 such that simultaneous presentation is better for positive information and sequential presentation is better for negative information.

Throughout the two experiments, the results suggest that simultaneous presentation mode appears to intensify the perceived strength of the valence of the given information; hence, the difference in rating between positive and negative information conditions looks more extreme in simultaneous presentation mode than in sequential mode. The next experiment was conducted to see if people perceive the difference between positive and negative information more easily in simultaneous than in sequential presentation mode. The mediation effect of construal levels in the relationship between presentation mode and rating difference was also examined. Finally, the response time was measured to test whether response time moderates the mediation effect of construal levels in product evaluation.

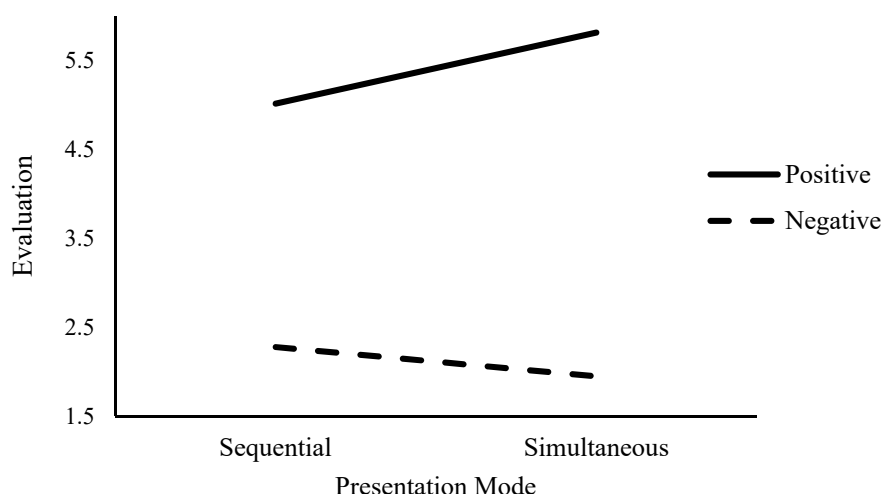


Figure 4. Result of Study 2

## 6. Study 3: Mediation of Construal Levels and Moderated Mediation of Response time

This study attempted to test if the rating difference persists between two presentation modes even when the same individual respondent is exposed to both positive and negative information about the product. Thus, participants in Study 3 rated both positive and negative sets of information, and their rating differences were calculated and served as dependent measures.

### 6.1 Method

Study 3 used a 2 x 2 mixed design (presentation mode: simultaneous vs. sequential; valence of the information: positive vs. negative), with presentation mode being a between-subject factor and valence being a within-subject one. 152 participants volunteered to participate through Amazon Mechanical Turk and completed the experiment. They were randomly assigned to either sequential or simultaneous presentation mode, and this experiment required them to read both positive and negative information. For stimuli, I adapted customer reviews for a tablet PC from Amazon.com and created three positive (e.g., “I was impressed by just how amazing the screen looks. All the colors are bright, vivid, and crisp with no discernible pixels, no dead pixels, and all the blacks are truly black and all the reds are truly red. This tablet provides the auto-brightness function and it works really well. It is not blinding at night with the lights off and it’s bright enough during the day.”) and three negative (e.g., “The battery can go only about 5 hours even in a perfect setting but it actually

is as low as 3 hours under slightly compromising to severe conditions. When I work using this tablet outside the office or home I often struggle with looking for outlets. This is so disappointing”) customer reviews.

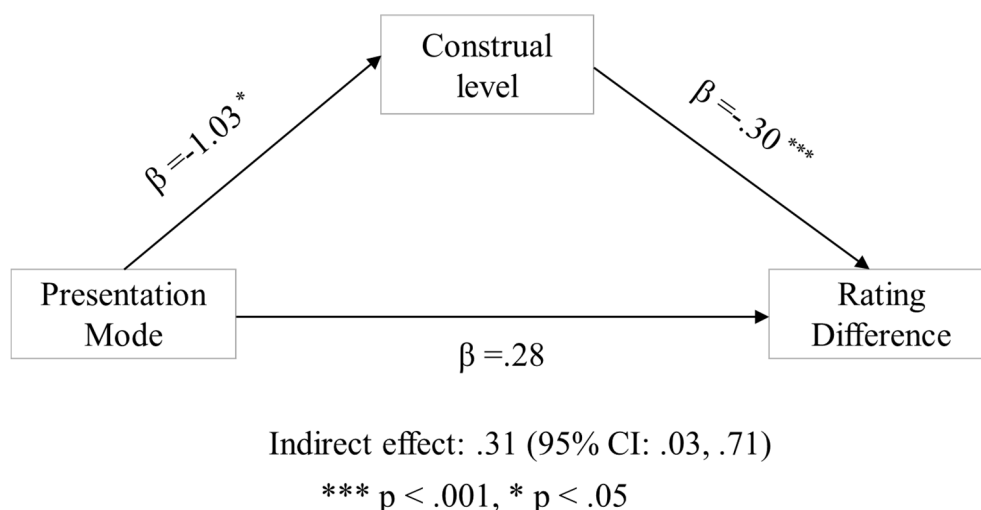
Participants in the sequential presentation mode condition read two sets of customer reviews, one positive and the other negative. In each set, reviews were presented sequentially. Participants rated the tablet PC on WTB and attractiveness after being exposed to each set. Specifically, participants read three positive reviews in sequential manner and evaluated the product. After the first set, they read three negative reviews one at a time and rated the product. Accordingly, each participant generated two rating scores, one being an evaluation based on positive reviews, and the other being an evaluation based on negative reviews. Participants in simultaneous presentation conditions also read two sets of reviews. Reviews in each set were presented simultaneously. They rated the product after reading each set of reviews, as in sequential presentation conditions. Participants rated WTB and attractiveness of the tablet PC on a 7-point Likert scale with 1 being “very unlikely” or “very unattractive” and 7 being “very likely” or “very attractive.” The presentation order of positive and negative reviews was counterbalanced. Half the group read the positive reviews first and the other half read negative ones first. The dependent measure—the rating difference—was the absolute difference between evaluation based on positive reviews and evaluation after reading negative customer reviews. Along with the evaluation, response time was measured to see how long each participant took to read product reviews and evaluate the product.

After participants rated the product, they completed the categorization task [21] to see if presentation mode primed different construal levels. Test items are adapted from those developed by [13], who developed 10 categories and asked respondents the extent to which individual members are perceived as typical or atypical of the category. I used three categories—“clothing,” “vehicle,” and “furniture”—and chose 12 members from each category. Participants rated items on a 10-point scale (1 = “definitely does not belong to the category”; 5 = “does not belong to the category, but is very similar to members of that category”; 6 = “does belong to the category, but is not a very good example of it”; 10 = “definitely does belong to the category”). The item rated over 5 was considered as typical in the given category. For each category, four items were atypical exemplars and the remaining eight items were typical exemplars that were composed of four strong and four moderate exemplars. For example, “hat” is atypical, “pants” is strongly typical, and “overcoat” is a moderately typical exemplar of the “clothing” category. The number of items rated over 5 is the measure of construal level. Larger numbers indicate higher construal.

## 6.2 Results and Discussion

Independent-sample t-test revealed a marginally significant difference between sequential and simultaneous presentation modes in rating difference ( $t(150) = -1.83, p = .07$ ). Rating difference was greater in simultaneous mode ( $M = 3.76, SD = 1.76$ ) than in sequential mode ( $M = 3.18, SD = 2.19$ ), confirming the prediction that simultaneous presentation mode intensifies the perceived valence of the information, and thus the perceived difference between positive and negative reviews become more extreme in simultaneous presentation mode. This result is in line with the findings from Studies 1 and 2. An independent sample t-test revealed that the number of items rated over 5 in the categorization task is significantly greater in sequential presentation mode ( $M = 5.42, SD = 3.64$ ) than in simultaneous ( $M = 4.39, SD = 2.59$ ) presentation mode ( $t(150) = 2.00, p = .047$ ). This result provided evidence that sequential presentation mode generates higher level construal than simultaneous presentation mode, which supports H2a.

To test the prediction that differing construal levels mediate the relationship between presentation mode and evaluation, I used bootstrapping process ( $N = 5000$ ) using model 4 in PROCESS macro [31]. The analysis showed that construal level mediated the relationship between presentation mode and evaluation (indirect effect = .31, LLCI = .03, ULCI = .71). Presentation mode was significantly correlated to construal level ( $\beta = -1.03, p = .047$ ) and construal level significantly affected the rating difference ( $\beta = -.30, p < .001$ ). Simultaneous presentation mode generated lower construal than sequential presentation mode, and lower construal level was associated with greater rating difference. Thus, Hypothesis 2, which predicts the mediating role of construal level, was supported (see Figure 5).



**Figure 5.** Mediation of Construal Levels

I used bootstrapping process ( $N = 5000$ ) using model 14 in PROCESS macro [31] to test Hypothesis 3, which predicts moderated mediation by response time. The analysis confirmed our prediction. Mediation of construal level was significant for the participants with faster response time (conditional indirect effect = .40,  $SE = .20$ ,  $LLCI = .05$ ,  $ULCI = .86$ ) but not for those with slower response time (conditional indirect effect = .04,  $SE = .14$ ,  $LLCI = -.18$ ,  $ULCI = .44$ ). It appears that participants who spend more time processing and responding to the information are not influenced by a temporally induced context, which in this case is the construal level.

This proposition also was supported by significant moderating effect of response time in the impact of construal level on rating difference ( $\beta = .00$ ,  $p = .001$ ). Specifically, the effect of the construal level was significant for participants with faster response times (1 SD below the mean response time:  $\beta = -.36$ ,  $p < .001$ ), while it was insignificant when the response time is slower (1 SD above the mean response time:  $\beta = -.10$ ,  $p = .14$ ). Thus, processing the information for a longer time diminished the impact of the extent of the abstractness on rating difference. When participants skimmed the information, the valence of information was perceived as being more vivid than it was, thereby leading to a greater rating difference than when participants spent enough time processing the information. The results in Study 3 suggest that the impact of temporally induced factors and construal level in information processing will disappear when people deliberate longer.

## 7. General Discussion

This project began with the aim of investigating and prescribing which presentation mode will enhance preference-simultaneous or sequential? I find that the answer to this question is nuanced: it is better to present positive information simultaneously, but negative information should be presented sequentially. This is driven by the fact that simultaneous information presentation leads to an aggregate compounding effect that increases the overall impact of the information presented. Such polarization will enhance preferences for the target item if the information is positive, but will in fact hurt preferences if the information is negative.

The current findings contribute to the theory in three distinct directions. First, the present findings extend existing literature on the presentation effect in judgment by showing that construal-level is another mechanism through which presentation mode affects evaluation. Previous studies on presentation mode have suggested that the emotion of hope [2] and evaluability (i.e., whether the attribute is easy to evaluate or not) of the stimuli [1], [3] are key underlying factors that explain why different ways of presentation affect subsequent decision-making. The present study proposes construal levels as a mechanism that underlies the relationship between presentation mode and evaluation and this argument is supported by significant mediation effect of construal level in the relationship between presentation mode and evaluation that was shown in study 3. Simultaneous presentation mode led to more polarized evaluation than sequential presentation mode and this polarization occurred due to different construal-level state. To be specific, positive (vs. negative) product information generated more favorable (vs. unfavorable) evaluation when they are presented simultaneously than sequentially. This is because simultaneous (vs. sequential) presentation mode induced low (vs. high) construal-

level state that generates more extreme attitudes in the face of valence information [25]. The present finding would provide the guideline of proper display of customer review with online retailers. For example, positive customer reviews should better be displayed on a same screen so that customers can be exposed to them simultaneously by just scrolling down the screen. In contrast, negative reviews should be presented separately such that customers should move on to the next page to see another review.

Second, this study proposes that presentation mode is another method of inducing different construal-level states. To the best of my knowledge, no existing literature have used presentation mode to induce differing construal levels. Previous literature on construal-level theory have used various methods to generate differential construal levels. Some studies have asked participants to read scenarios that are written for the near or distant future [8] or asked participants “how” or “why” they engaged in a particular activity [10]. Each of these methods was designed to generate high and low construal, respectively. The present study suggests that the way stimuli is presented can also induce differing levels of construal. Because sequential (vs. simultaneous) presentation mode encourages alternative- (vs. attribute-) based information processing [15], each mode was predicted to induce holistic (vs. analytic) processing, which occurs in high (vs. low) construal-level state. Study 3 showed that sequential (vs. simultaneous) presentation mode induced high (vs. low) level construal as predicted. This finding provides new way to prime differing levels of construal with researchers in social science domain. For example, researchers may ask participants to recall the stimuli that have been presented either simultaneously or sequentially.

Finally, this study suggests that deliberation would resolve the bias in decision as Study 3 showed such that deliberation mitigated the impact of presentation mode on evaluation. It could be a bias that a natural ability to distinguish between positively and negatively valenced information was intensified under simultaneous presentation condition. Such an oddity disappeared with greater deliberation, which was reflected in a slower response time. As I mentioned in the Introduction, procedural invariance is a key axiom in rational choice theory [4], such that the relative preference between two options should remain unaltered no matter how they are presented. However, as previous literature [1, 2] and the current study clearly showed, the presentation mode of stimuli strongly affect preference. The finding in Study 3 suggests that such a violation could be mitigated through deliberation. Specifically, Study 3 showed that participants who were less likely to deliberate was highly affected by contextual factors-the evoked construal level-while those with greater deliberation were not in information processing. Thus, presentation mode-driven biases can be mitigated by encouraging greater deliberation.

This study is not without its limitations. This study measured participants’ attitudes toward the product (e.g., perceived attractiveness, WTV, and WTB) based on the product information instead of their actual choices. Since attitude does not always predict behavior [32, 33], polarization in attitude under simultaneous presentation conditions would have not been observed from behavior. Future research can address this issue by directly asking participants whether they would choose the option using a dichotomous scale after being exposed to sequentially or simultaneously presented positive (vs. negative) product information. If the proportion of participants whose answer is “Yes” (vs. “No”) is greater in simultaneous than in sequential presentation mode, it supports our main theory that simultaneous presentation mode is favorable for positively valenced information while it is not a good strategy for presenting negatively valenced information. It will provide a clearer picture of how presentation mode affects preference if participants are exposed to both positive and negative product information either in sequential or simultaneous presentation mode and are asked to choose between them. If the proportion of choosing the option with positive over negative product information is significantly greater in simultaneous than in sequential mode, our conjecture that simultaneous presentation mode intensifies the emotional valence of the information. Future research can test those possibilities.

Results in Studies 1 and 2 showed that differences in rating between sequential and simultaneous presentation mode were significant only for positive information but not for negative information. The evaluation of negative information was not affected by presentation mode. Interaction effects were observed due to differences in the evaluation of positive information between the two presentation modes. If evaluation based on negative product information were greater in sequential than in simultaneous presentation mode, it would have provided more intense support for the main conjecture of the current study. This result might have been due to negative bias [34] such that negatively valenced things have a greater impact on our psychological state. The negative bias might be the reason why the evaluation of negative information was not influenced by the context, that is, the presentation mode, while evaluating positive information was strongly influenced by the

context. Even with this limitation, the study still contributes to the existing literature on judgment by identifying the context that enhances or compromises the perceived favorableness of positive information.

**Conflicts of Interest:** The authors declare no conflict of interest.

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