

## Presentation-Order Effect of Product Images on Consumers' Evaluations in Online Shopping

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### Introduction & Literature Review

Presentation order for product images in online stores may be influential for prompting wants and increasing online purchasing. Consideration of the ordering of information in a presentation can be used to examine whether individuals pay more attention to the information presented first (primacy effect) or last (recency effect). Researchers found mixed results of primacy and recency effects. Buda and Zhang (2000) found that product attractiveness was lower when negative ratings from a shopper were presented before rather than after the product descriptions (primacy effect). Hogarth and Einhorn (1992) reported that recency effect was associated in prior research with complex information, while the primacy effect was associated with long-series information. However, only a few researchers have investigated image presentation-order effect. Pandelaere, Millet, and Van den Bergh (2010) found that a left image is preferred over a right image (primacy effect). However, this result may also be explained by brain hemispheric lateralization rather than ordering effect. Information on the left is processed by the right hemisphere, which is better suited to process visual information (Janiszewski, 1988). Liu, Phau, and Teah (2017) showed that participants provided higher affective evaluations for a product image seen first before viewing video advertisements than when presented in reverse order (recency effect).

The mechanism of image presentation-order can be explained by using the mental imagery framework. Mental imagery processing is thought to be holistic and based on sensory representation of perceptual information in the memory rather than on a conscious evaluation of products in a feature-by-feature mode (Kosslyn, Thompson, & Ganis, 2006). Yoo and Kim (2014) found that an apparel product image with a concrete consumption background showing a relevant lifestyle increased purchase intention through elaborated mental imagery processing. Recency effect was found in Liu et al.'s (2017) study about image and video order. Further, in Biswas, Grewal, and Roggeveen (2010) study in the context of wine testing, the researchers confirmed the recency effect for experience products (e.g., wine) with the justification that initial sensory information (e.g., taste) in memory diminishes when additional sensory stimuli (e.g., new wine) enters memory. As an image is likely to activate a non-verbal system similar to other sensory information (Paivio, 1991), the recency effect is expected for the image order.

H1. When the image evoking high mental imagery processing is presented after rather than before the simple product image, consumers engage in higher mental imagery processing (i.e., recency effect), which in turn increases their purchase intentions.

The recency effect can be moderated by variations of product presentation methods resulting in the primacy effect. Hogarth and Einhorn (1992) reported that previous researchers found the

primacy effect when a long series of information was presented. When many pieces of information are given to individuals, they can become tired of processing, and/or they become less sensitive to the information that enters later and may make only minor adjustments to their first set anchor (Hogarth & Einhorn, 1992). Further, Schnotz (2005) argued that the visual working memory has limited capacity to process and store visual information. Thus, as the amount of available pictorial information to process is increased, memory capacity is limited to process later information, resulting in primacy effect (Waugh & Norman, 1965).

H2. When the number of images are increased, consumers are more engaged in mental imagery processing, and consequently have higher purchase intentions when images evoking high mental imagery processing are presented first and simple product images are presented later than in the reversed order (i.e., primacy effect).

### Method

The between-subject experimental design was conducted with 2 (order of images: image/s evoking high mental imagery before vs. after the simple product image/s)  $\times$  4 (the number of images: one, two, three, and four images)  $\times$  2 (dress style replicates), resulting in 16 conditions. For the image evoking high mental imagery, pictures with a relevant consumption background were chosen where a model was wearing a dress and accessories. For the image evoking low mental imagery, a simple product image of the dress on a mannequin against a plain white background was used. The four images included front, back, side, and detail/close-up views and were placed vertically. After reviewing the information, respondents were asked to answer questions about mental imagery processing (Yoo & Kim, 2014) and purchase intentions (Dodds, Monroe, & Grewal, 1991).

### Results

In three-way ANOVA result, no main effect of dress styles and interaction effects between dress styles and other variables on mental imagery processing were found; thus, the data of two dress styles were merged. After merging the data, a two-way ANOVA was conducted. No significant main effects of the order of product images and the number of images on mental imagery processing were found. However, the interaction effect between image presentation order and number of images on mental imagery was significant ( $F_{(3, 299)} = 3.82, p \leq .01$ ). Further, the planned contrast results showed that in one-image condition, participants were more likely to go through mental imagery processing when they saw an image evoking high mental imagery processing last rather than first, showing the recency effect ( $t = -2.30, p \leq .05, M_{\text{High imagery image first}} = 4.48, M_{\text{High imagery image last}} = 5.17$ ). In the four-image condition, participants were more likely to be engaged in mental imagery processing when they were exposed to four images evoking high mental imagery processing before the four simple product images than for the reversed order, showing the primacy effect ( $t = 2.26, p \leq .05, M_{\text{High imagery image first}} = 5.17, M_{\text{High imagery image last}} = 4.50$ ). For the two-image and three-image conditions, there were no significant image order effect. The PROCESS analysis showed that the interaction effect of the order and the number of image on purchase intentions was through mental imagery processing ( $-.54 < CI < -.14$ ). When

the amount of image information was high (i.e., four images), presenting images evoking high mental imagery processing first increased mental imagery processing more than presenting the images last, which increased purchase intentions ( $-.86 < CI < -.09$ ). When the amount of image information was low (i.e., one image), presenting images evoking high mental imagery processing last rather than first increased mental imagery processing more, which increased purchase intentions ( $.18 < CI < .93$ ). Therefore, the results support H1 and H2.

### Conclusion

This research provides theoretical and practical insights for both researchers and online retailers on the effectiveness of ordering product images according to the number of product images to elicit outcomes that are more positive. By examining the effect of the amount of image information on image presentation order effect, which has been limited or missing in previous research, this study adds to the literature on image presentation order within the context of information volume, and demonstrated a moderating role of number of images that can influence the image presentation order. Further, based on the result of this study, online retailers should place an image evoking high imagery after rather than before a simple product image, when only two images are presented. In contrast, when many product images (e.g., more than six images) are presented, placing images evoking high imagery first rather than last is expected to increase intention to purchase and, thus, a potential for more profitable outcomes.

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