

# AMCIS 2015 Puerto Rico Paper Submission

## Multimodal Message Incongruence on E-Commerce Websites

*Emergent Research Forum Paper*

**Kiljae Lee**

Embry-Riddle Aeronautical University  
kiljae.lee@erau.edu

**Jungsil Choi**

Cleveland State University  
j.choi59@csuohio.edu

### Abstract

This study investigates the impact of incongruence between visual and text-based information about a product provided by sellers on e-commerce websites. We hypothesize that the incongruence between the quantity presented in a visual representation and a text-based description will produce a negative effect on the product evaluation of customers. Two pilot studies provide initial evidence to support this hypothesis. This result suggests that the effect needs to be further investigated with higher level of sophistication both in terms of theory and empirical support. While it is generally encouraged to maintain design-level consistency in multi-modal communication setting, e-commerce researchers and practitioners have not perfected the mechanisms to respond to message-level incongruence issue. By adopting dual process theories of thinking, when completed, this study will provide a detailed theoretical account of how incongruence between visual representation and linguistic descriptions would affect customers' evaluation of a product selling online.

### Keywords

Incongruence, information processing, e-commerce, peripheral cue, cognitive elaboration.

### Introduction

Online transaction is pervasive partly because it is more flexible to apply various sales strategies such as bundling and unbundling. The vendors change the units of sales offering a bundle price as well as the visual aids describing the products with a few simple clicks. Many products are sold online as a package. For instance, we often see a pack of four soaps, a pack of six toothbrushes, a pack of three pain relief tablets at online shopping sites. We find that, in many occasions, online retailers simply post a product image that features a single item while they state the item is being sold by packages of two, six, or a dozen. What difference would it make in evaluations of the product whether they present an incongruent image of a single item or a congruent picture featuring six items when the item is described as being sold by packages of six?

Processing incongruent information that interferes each other requires greater efforts and response time. Stroop effect (Stroop 1935) refers to one of the most frequently replicated classic observations in cognitive psychology. It suggests that subjects responding "red" to the word "blue" displayed in red colored fonts are slower than those responding "red" to the word "red" displayed in red fonts. With increasing number of options and overloaded information, online consumers are hard pressed to process a smaller fraction of the information available (Hauser and Wernerfelt 1990; Wang and Shukla 2013) and shift toward simplified, heuristic decision strategies (Payne 1976). While it is a common form of questions for online shop operators, e-commerce researchers and practitioners have not perfected the mechanisms to respond to message-level incongruence issue. This study examines customer's perception associated with the

incongruence between visual and linguistic information about an online shopping item. Specifically, the study investigate the effect of incongruence between the stated quantity of products in a bundle and the quantity of items presented as an image on the customers' evaluation of the product.

## Literature Review

There is plenty of evidence in psychology and marketing research that peripheral cues affect people's attitude and purchasing intentions through heuristic processing (Chaiken and Eagly 1989; e.g., Maheswaran et al. 1992; Petty et al. 1991). Dual-process theories of thinking (Epstein 1994; Evans 2003; Evans 2008; Kahneman 2011; Maheswaran et al. 1992; Petty et al. 1991) postulate the existence of two human reasoning systems operating contrastively: system 1 (or heuristic system) and system2 (or analytic system). While the heuristic system, which operates automatically, functions as a default thinking process providing a quick and fast responses, the analytic system requires more elaborate resources providing slower responses. The heuristic and analytic system often act in concert resulting in fast and reliable judgments. Sometimes, however, the two systems conflict and cue inconsistent responses which engender a demand for analytic system to override the inconsistent responses from the default heuristic system (De Neys 2006; Stanovich and West 2000). We note that responsive nature of the visual representation initially attracts lower level of attentional focus but produces a quicker response automatically through a heuristic process. When online shoppers scan through products with an intention to purchase, the two systems in their minds operate in concert as long as both the image and descriptions send a congruent messages in processing the information. However, when the image that follows the descriptions does not provide a consistent information, the inconsistency will create an unpleasant need for analytic system to resolve itself. This would temporarily increase the demand for involvement of executive working memory as it is the case that solving logical reasoning tasks require cognitive resources by increasing mental processing (De Neys 2006; Schwarz 2004). This increases the mental efforts because analytical processing to consider alternatives is energy taxing (Alba and Hutchinson 1987; Wang and Shukla 2013). Since choice conflicts lead to negative emotion (Luce et al. 1997), such sudden cognitive demand for memory would shift the valence of shoppers toward an unfavorable direction through increased arousal.

The effect of incongruence between messages has been investigated under various contexts in marketing. With respect to a persuasive appeal, Mandler (1982) hypothesized that moderately incongruent messages are more effective than congruent or extremely incongruent messages because moderate incongruity intrigues novelty and facilitates greater involvement in cognitive information processing. Meyers-Levy and Tybout (1989) echoed this view by showing that products that are moderately incongruent with their associated category schemas leads to a more favorable evaluations than other products do. In their view, this positive consequences stem from the process of cognitive elaboration; incongruence leads to an attempt to resolve the identified discrepancy and the very process of resolving incongruity can be perceived rewarding and thus contribute to the positive affect when the discrepancy is moderate (ibid).

However, there is a seemingly contrasting view which suggests that it is the *match* between multiple presentations that creates a positive impact. For instance, Pan and Schmitt (1996) showed positive effects of match between peripheral feature associations (e.g., script or sound) and brand associations. They argue that the positive effect of congruence depends on the degree of consistency between peripheral cues and brand associations.

In the context of online shopping, when a visual representation of a product preconditioned an initial perception through a heuristic processing, the needed efforts to incorporate a mismatching piece of text-based information through an analytic processing would simply increase cognitive demand. The first processing merely impedes the second processing without the rewarding positive affect; the incongruence does not encourage the kind of cognitive elaboration that Mendler(1982)suggested. Hence, we hypothesize that the incongruence between the quantity presented in a visual representation and that illustrated in text-based description will produce a *negative* effect on the product evaluation of customers.

## Methodology

To test the initial hypothesis, we conducted two pilot study comparing the product brand attitude in a two experiments conducted in between-subject design.

## **Experiment 1-1**

### **Stimuli and Procedure**

For experiment 1-1, we designed two types of online shopping listings for imported toothbrush, Mentadent ProCare Toothbrush. We adapted this ad from an actual listings posted in Amazon.com (See Appendix 1). The actual listing shows only one figure of the product while the item is being sold in a six-item packages. On the margin of the top and right side the listing is a mark written as “six pack.” We used this original listing for one stimulus, and created another listing by modifying the number of figures. In the other listing, we matched a number of items and the number of packs on sale. So, if an actual sale is in six pack, we put six figures of the item. Each ad includes the identical information about product feature and price. Only the number of product pictures is different between two ads.

Forty-nine college students participated in the experiment in exchange for course extra credit. Participants were randomly assigned to look at one of two conditions. We asked them to look at the listing on a screen that emulates an ecommerce website and report their opinions about the product on the listing by answering the questions that follows.

### Results and discussion

We included familiarity with the brand as a covariate. We measured attitudes toward a brand on a three-item nine-point scale ( $\alpha = .893$ ). Interestingly, we find a significant difference of attitudes toward a brand depending on matching and mismatching between linguistic and pictorial information. We find that people have favorable attitudes toward the brand when a number of figures match with the description of sale information than when a single figure is shown ( $M_{\text{match}} = 6.824$ ,  $M_{\text{non-match}} = 6.072$ ,  $F(1, 46) = 4.108$ ,  $p = 0.048$ ,  $\eta^2 = 0.082$ ).

## **Experiment 1-2**

We replicated Experiment 1 with a different product. The product in Experiment 1 was imported from Germany, so not many participants were familiar with the brand. Whereas, we chose a well-known American toothpaste brand, Sensodyne ProNamel Mint Essence. The original listing posted on Amazon.com also shows one figure of the product though it sales on a four pack. We designed another ad where a number of figures matches with the number pack being sold.

Forty-three college students participated in the experiment in exchange for course extra credit. We followed the same procedure as that of Experiment 1-1.

### **Results and discussion**

We included familiarity with the brand as a covariate in an analysis. We measured attitudes toward a brand on a three-item nine-point scale ( $\alpha = .877$ ). Again, the result showed a significant difference of attitudes toward a brand depending on matching and mismatching between linguistic and pictorial information. We find that people have favorable attitudes toward a brand when a number of images matches the linguistic message of four, than when the number of image (i.e., one) does not math with the linguistic message of four ( $M_{\text{match}} = 7.147$ ,  $M_{\text{non-match}} = 6.513$ ,  $F(1, 40) = 4.8$ ,  $p = 0.034$ ,  $\eta^2 = 0.107$ ).

### **Discussion**

These two experiments suggest that incongruity between visual representation and text-based description about a product on e-commerce websites has interesting negative impact on online shopper's attitude toward a shopping item. However, it should be noted that is premature, at this interim stage of this research, to make a causal inference relating incongruence in multimodal messages and customers' product evaluation. According to Meyers-Levy and Tybout (1989), whether the effect of incongruity is positive or negative depends on how easy it is to resolve the incongruity and how satisfactory the resulting outcome after the resolution is to the information processor.

Based on the result reported here, therefore, the effect needs to be further investigated with varying operationalization from the perspective of easiness and satisfaction. Also, the effect need to be qualified by introducing moderating variables (i.e., gender and culture) in order to determine the intricacies about how and through which underlying process this effect actually takes place.

This study seeks to achieve the following objectives when finalized: (1) provide a comprehensive theoretical account of how the (in)congruity between visual and text-based messages affect the information processing of the online shoppers and 2) identify the key criteria to predict the negative effect of incongruity among multi modal messages in e-commerce context. The result will also provide a convincing recommendation to the practitioners how the incongruity should be managed.

## Appendix 1 Pilot test listing images



**Preserve Adult Ultra Soft Toothbrush Pack Of 6**  
by Preserve  
★★★★★ 1 customer review

Available from these sellers.

- We consulted closely with dental professionals to

3 new from \$18.44

**Back to Business**  
Start the New Year with business essentials, including janitorial supplies, workplace safety products, office supplies, & more. [Shop now](#)

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**Preserve Adult Ultra Soft Toothbrush Pack Of 6**  
by Preserve  
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