



# Attentional capture and importance of package attributes for consumers' perceived similarities and differences among products: A case study with breakfast cereal packages



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## ABSTRACT

The present work studied attentional capture and importance of package attributes for consumers' perception of similarities and differences among products through a combination of eye-tracking and projective mapping. As a case study, fifty consumers performed a projective mapping task with ten breakfast cereal packages while wearing a mobile eye-tracker. The combination of mobile eye-tracking and projective mapping enabled a more comprehensive analysis of the importance of package attributes for consumer perception. Eye tracking allowed the identification of the most relevant package features for perceived similarity and differences among products and spotted attributes that were attended to but were not relevant, as well as package features that were relevant for categorization but were not largely attended to. Results suggest that studying attentional capture could contribute to better understanding attribute importance for consumer perception. Irrespectively of the saliency, most consumers looked at the same key information, mainly located on the front-of-pack. Few consumers read the nutritional label and ingredient list (a much lower proportion than in previous static eye tracker studies). Results suggested that mobile eye-tracking has a great potential for assessing consumers' evaluation of packages in ecological settings. However, several disadvantages and limitations of the technique should be taken into account.

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## 1. Introduction

Packaging has become a key marketing strategy and plays an important role in attracting consumers' attention (Clement, 2007; Moskowitz, Reiser, Lawlor, & Deliza, 2009; Rettie & Brewer, 2000; Silayoi & Speece, 2007). Package design strongly affects consumers' attention, sets up sensory and hedonic expectations and can even modulate future product experiences (Ares & Deliza, 2010; Becker, van Rompay, Schifferstein, & Galetzka, 2011; Deliza & MacFie, 1996; Schifferstein, Kole, & Mojet, 1999). Packages are important sources of information since they communicate the products' main characteristics, allowing consumers to make inferences about them (Carneiro et al., 2005; Silayoi & Speece, 2007; Steenkamp, 1990). Also, the increasing need to differentiate products in the marketplace has led to include information about credence

attributes, such as health claims (Lähteenmäki, 2013), environmental sustainability (Leire & Thidell, 2005) or quality (Jahn, Schramm, & Spiller, 2005).

Thus, understanding how consumers evaluate food packages when making their purchase decisions and identifying important package attributes for consumer perception are relevant inputs for package design and communication strategies.

The importance of package attributes is a multidimensional construct composed of three main dimensions: salience, relevance and determinance (Van Ittersum, Pennings, Wansink, & van Trijp, 2007). Salience measures the availability of an attribute in memory, which, for any reason, stands out from the rest, and would affect the order of verbalization of the attributes if prompted to enumerate them. Relevance, on the other hand, can be regarded as the extent to which the attribute provides benefits related to consumers' values and desires (Myers & Alpert, 1977). In other words, a piece of information is relevant to an individual when it connects with background information that he/she has available to yield conclusions that matter to him/her (Wilson & Sperber, 2004). Meanwhile, attribute determinance is related to its importance in judgment and choice (Van Ittersum et al., 2007). Determinance goes beyond relevance; an attribute can be extremely

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relevant (e.g., safety of automobiles) but it can have no real effect on choice if all products are perceived to be equal for this attribute (Myers & Alpert, 1977).

Several methodologies can be used for estimating the importance of package attributes. Categorization within a category is one of the commonly used methodologies during new product development. It enables to identify the key elements within a food category and to identify product opportunities (Ahmad & Richard, 2014).

The evaluation of similarities and differences among products relies on an overall representation of the products, which is achieved through a process of synthesis, that determines the relative importance of the different characteristics (Jaeger, Wakeling, & MacFie, 2000). Distinct cognitive processes are involved in this evaluation. Consumers usually base their evaluation on cognitive schemas related to their knowledge about the food category or considering specific features of the products (Wadhera & Capaldi, 2012).

Holistic methodologies, such as projective mapping, can be used to study the main package attributes underlying consumers' perception of similarities and differences among product methodology (Risvik, McEvan, Colwill, Rogers, & Lyon, 1994). Projective mapping has been increasingly applied for sensory product characterization of food products with consumers (Varela & Ares, 2012). This methodology has also been applied for characterizing packages (Carrillo, Varela, & Fiszman, 2012a) and to get an insight into how information on the pack influences hedonic or other perceptions (Carrillo, Varela, & Fiszman, 2012b).

One of the limitations of projective mapping is that it does not allow us to conclude if some package features are not relevant for the categorization or if they did not catch consumers attention, and therefore they were not processed. Thus, the use of mobile eye-trackers while consumers perform a projective mapping task could contribute to a better estimation of the determinance dimension of attribute importance.

In a few seconds wherein consumers usually invest evaluating food products, they do not attend to all the information included on food packages (Milosavljevic & Cerf, 2008). Therefore, attentional mechanisms select part of the information for further processing, while the rest of the information is not processed and consumers do not become aware that it is there (Pieters, 2008). Attention, defined as the degree to which consumers focus on a stimuli within their range of exposure is a pre-requisite for information processing and therefore a key step in consumer decision making process. Both bottom-up and top-down processes mediate consumers' attention towards the different elements of a food package. Bottom-up attention is a rapid and automatic form of attentional capture that depends on the characteristics of the stimulus (e.g., its color, size, shape, saliency of the element from the background in which it is included) and occurs even when the consumer is not specifically searching for it (Wolfe, 1998). On the other hand, top-down attentional capture depends on consumers' interest and motivations when evaluating the stimulus and requires consumers to voluntarily search for specific information (Koch, 2004). Thus, if a certain package element does not automatically catch consumers' attention (bottom-up process), they would not use it for making their choices unless it is relevant for them and they would specifically try to find it on the package (Greenwald & Leavitt, 1984).

Despite the role of attentional capture, little research has been found reporting the cognitive process that mediates consumers' evaluation of food packages. Most research has been based on the estimation of the importance of different package characteristics after they have captured consumers' attention (Ares & Deliza, 2010; Carrillo et al., 2012a,b; Deliza & MacFie, 1996; Lange, Issanchou, & Combris, 2000; Moskowitz et al., 2009). In this context, studying attentional capture can contribute to the study of attribute importance and could be a relevant area of research for people working in sensory and consumer science, marketing, and graphic and package design.

Eye-tracking techniques have a great potential for objectively assessing consumers' perception of visual stimuli (Pieters, 2008) and are being increasingly used in sensory and consumer science

(Ares et al., 2013; Mitterer-Daltoé, Queiroz, Fiszman, & Varela, 2014; Piqueras-Fiszman, Velasco, Salgado-Montejo, & Spence, 2013; Soederberg Miller & Cassady, 2012). Most of these studies use static eye-trackers, which involve the presentation of visual stimuli on a monitor and recording the participants' gaze patterns. However, when dealing with food packages, this type of approach could potentially increase the salience of the information which is usually presented on the sides and back of the packages. In this sense, mobile or head mounted eye-trackers could have several advantages to study consumers' perception of real packages and labels in more ecological situations, as participants can move around and evaluate real products, as they would normally do in a real-life situation.

The present work aimed at studying attentional capture and attribute importance of package features for consumers' perceived similarities and differences among products of a food category through a combination of projective mapping and eye-tracking, using breakfast cereals as a case study.

## 2. Materials and methods

### 2.1. Stimuli

Breakfast cereal packages were chosen as stimuli as they usually contain diverse extrinsic attributes, which made them good candidates for this methodological study. Ten commercial breakfast cereal samples were selected as stimuli. Samples were selected to get a wide range of products in terms of type of product, brand, nutritional characteristics, and nutritional and health claims on the packages. Samples represented the main characteristics of the products available in the Uruguayan market and included the four main brands (brand A was the most relevant). They were purchased from various Uruguayan supermarket chain stores located in Montevideo. For interpretation purposes they were named as follows: sugar added flakes (S1, S2, S3), honey-added flakes (H), high fiber (F1, F2, F3), whole cereal (W) and muesli (M1, M2). These names represent the main characteristic of the samples, but more detailed information could be seen in Table 1. Also, four examples of the front of packages are shown in Fig. 1. Commercial samples were used in the experiment so there was no experimental design involved. The idea was to cover a wide range/combination of extrinsic factors. In this sense, it is important to stress that the samples were similar and different in many characteristics that were not included in the name chosen for interpretation. For example, sample H corresponded to a "Corn-flakes with honey" product, but samples M1 and M2 also contained honey. Also, samples F1–F3 were named as "high in fiber", but there were other samples that were also formulated with whole cereals (H, S3, W) or that contained oats (F2, F3, M1, M2).

**Table 1**

Characteristics of the cereal package samples used as stimuli in the projective mapping task. Same letters in the column brand represent products of the same brand. Note: S1, S2, S3 sugar added flakes; H honey-added flakes, F1, F2, and F3 high fiber, W whole cereal and M1 and M2 muesli.

Sample	Brand	Description
F1	A	Seed assortment (sesame, flax, sunflower) with soy protein
F2	A	Oat bran, wheat bran, soy protein, wheat germ and honey
F3	B	Oat bran
H	C	Corn flakes with honey, fortified with vitamins, iron and zinc. Made with whole cereal.
M1	A	Muesli with honey. Assortment of rolled oat, raisins, corn flakes, coconut, sesame seeds, wheat germ, brown sugar and honey.
M2	D	Muesli. Assortment of corn flakes, oat flakes, wheat bran, sugar, coconut and honey, fortified with vitamins, iron and zinc.
S1	E	Corn flakes with sugar
S2	D	Corn flakes with sugar, fortified with vitamins, iron and zinc
S3	C	Corn flakes with sugar, fortified with vitamins and iron. Made with whole cereal.
W	C	Wheat, rice and corn-based extruded flakes, fortified with vitamins and iron. Made with whole cereal.

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