



## What do you mean by hot? Assessing the associations raised by the visual depiction of an image of fire on food packaging



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### ABSTRACT

The images shown on food packaging play an important role in the processes of identification, categorisation and the generation of expectations, since the consumer uses the images to infer information about the product. However, a given image may convey different meanings (e.g. in a food package, “fire” may mean *barbecued* or *spicy*), so it is very important for producers and designers to understand the factors responsible for consumers inferring a specific meaning. This paper addresses this problem and shows experimentally that the consumer tends to infer the meaning from the image which is most congruent with the product it is displayed with. 65 participants carried out two speeded classification tasks which results show an interaction between the product (congruent vs. incongruent) and the image (with fire vs. without fire): products congruent with a meaning of fire were categorised more quickly when shown with fire than without it, while products incongruent with a meaning of fire were categorised more slowly when shown with fire than without it. In addition, the results show that stimuli were categorised more quickly when the interpretation of fire was literal (e.g. barbecue) than in those that were metaphorical (e.g. spiciness), indicating that the rhetorical style of the image (literal or metaphorical) influences the cognitive effort required to process it. These contributions improve our understanding of the effect of the images shown on packaging in the communication between packaging and consumers.

### 1. Introduction

When consumers first observe a product, they use its visual appearance to identify and categorise it (Loken, 2006; Loken, Barsalou, & Joiner, 2008). Categorisation is the process by which consumers organise and group information into categories, i.e. sets of entities, objects or events related to each other in some way. In the context of shopping in a supermarket, this process allows the consumer to group and classify the different products according to their attributes and common features (Loken et al., 2008). Indeed, packaging is considered a relevant communication tool used by brands to inform consumers (Azzi, Battini, Persona, & Sgarbossa, 2012; Mumani & Stone, 2018), and its different elements and features act as signs from which consumers infer meaning –enabling them to identify and categorise each product (Celhay & Remaud, 2018; Festila & Chrysochou, 2018; Spence, 2018). As indicated by Ares et al. (2011), based on the semiotics of Peirce (1991), two main types of signs can be distinguished in the context of food packaging: linguistic signs, which produce meaning only by social convention (e.g. texts and verbal expressions), and visual signs, which

produce meaning by resemblance (e.g. colours, shapes, images and illustrations). Both types of signs are frequently used in food packaging and the consumer relies on both textual claims as well as images and other visual features to identify and categorise the product; thus enabling the generation of expectations (Smith, Barratt, & Selsøe Sørensen, 2015). While the role played by linguistic signs and some visual signs such as colour in these processes have been widely studied to date (Kauppinen-Räsänen, 2014; Lähteenmäki, 2013; Magnier & Schoormans, 2017; Piqueras-Fiszman & Spence, 2015; Spence & Piqueras-Fiszman, 2014; Sütterlin & Siegrist, 2015); the specific effect of the images displayed on the packaging in the communication between package and consumer has received less attention.

Compared to textual claims, the role of images in the categorisation process is especially prominent because they are the first elements from which the consumer infers meaning: images capture the attention faster than texts (Honea & Horsky, 2012; Silayoi & Speece, 2007; Venter, van der Merwe, de Beer, Kempen, & Bosman, 2011) and their processing require less cognitive effort (Mueller, Lockshin, & Louviere, 2009; Underwood & Klein, 2002). Images access the semantic representation

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of a concept with more speed than words (Pellegrino, Rosinski, Chiesi, & Siegel, 1977; Potter & Faulconer, 1975; Smith & Magee, 1980), so the consumer generates expectations more quickly by seeing an image than by reading a text (Underwood & Klein, 2002). Controlling the first impact produced by a package through the way in which the image is interpreted is crucial, since the first impression tends to influence the judgment of the consumer and may condition the subsequent attitude towards the product (Epley & Gilovich, 2006; Madzharov & Block, 2010).

However, it should be noted that not all images are processed in the same way. The rhetorical style of an image conditions the way in which its meaning is processed. The rhetorical style of an image refers to whether its meaning is literal or metaphorical (Jeong, 2008; Phillips & McQuarrie, 2002). From a cognitive point of view, the process by which a metaphorical message is decoded is more complex than that to interpret a literal message, since it evokes a set of more complex semantic associations in the memory of the observer (Gentner, 1983; Jeong, 2008). The rhetorical style of an image is assumed to be literal when its possible meanings are directly related to the object represented (e.g. showing an image of a strawberry on a food package reminds the consumer that the strawberries have some relation with the flavour, aroma or shape of the product; Smith et al., 2015), while it is assumed that the rhetorical style is metaphorical when the possible meanings of the image are related to another domain than that of the represented object (e.g. showing an image of a lion (source domain) as a metaphor of force in a coffee package (target domain); Fenko, Vries, & Rompay, 2018). It may even be the case that the same image has an ambiguous rhetorical style and can adopt both literal and metaphorical meanings within the same context: e.g. showing an image that represents fire on a food package can have a literal meaning (barbecue) or a metaphorical one (spiciness).

In practice, it is not easy for a designer to anticipate the meaning a consumer will infer from an image displayed on a food package. An image by itself is propositionally indeterminate and can evoke many interpretations in the mind of the consumer, since it lacks the syntactic devices necessary to emit an explicit propositional meaning (Messaris, 1994, 1997; Smith et al., 2015). For example, consider the case of depicting a strawberry on a food package: the consumer may interpret the product as tasting of strawberries, made of strawberries and so on (Smith et al., 2015). Although this propositional indeterminacy can be broken by making the meaning of the image explicit by using supporting text (Barthes, 1977; Phillips, 2000), the paths by which the meanings of both components are decoded (text and image) are different and can lead to different interpretations. In that case, an additional process is required through which a definitive meaning is selected and the conflict thus resolved (Lewis & Walker, 1989), which can negatively affect the processing fluency and the overall attitude toward the product (Alter & Oppenheimer, 2009). However, for a packaging designer, knowing the factors responsible for the same image evoking one meaning or another in different contexts is essential to achieving effective communication with the consumer through packaging. This research aims to shed light in this regard by proposing that the congruence between the possible meanings of an image displayed on a food package and the product in which it is applied is key in the process by which consumers infer meaning from that image.

The context in which an image is depicted (e.g. the signs and cues that surround it) helps the observer's brain to consider its possible meanings (Miller, Malhotra, & King, 2006). Thus, it is assumed that the same image will elicit a different set of associations according to its context since, according to Sperber and Wilson's principle of relevance (Sperber & Wilson, 1995), the consumer will assume that the presence of the image is relevant in that context and discard the meanings that do not fit it. For example, it is reasonable to think that the same image of fire will convey meanings related to danger if displayed on a chemical container (e.g. hazardous or flammable), or meanings related to food if displayed on a food package (although it is worth noting that

there may be some exceptions, as in the case of icons referring the food package itself). Therefore, in the context of food packaging, a fire image could elicit literal meanings (directly related to fire, e.g. barbecue) or metaphorical meanings (related to the sensory domain, e.g. spiciness; Caterina, Schumacher, Timinaga, & Rosen, 1997; Tu, Yang, & Ma, 2016).<sup>1</sup> As a result, we propose:

**H1a.** The meanings elicited by an image of fire depicted on food packaging will be directly related to food.

**H1b.** The meanings elicited by an image of fire depicted on food packaging will have a literal and/or a metaphorical meaning.

Once the possible meanings have been limited after this categorisation process, different interpretations for the same image may still exist. Following the previous example, when depicted on a food package fire can still convey meanings like barbecue and/or spiciness. In the fields of semantics and language, some lines of analysis have been developed that seek to understand the factors by which an indeterminate stimulus evokes a particular meaning. Discussing the existing literature on this subject, Smith et al. (2015) distinguish between two approaches: the slot/filler approach and the analogy approach. The slot/filler approach assumes that if one of the possible meanings of the sign (filler) fits well with any of the possible attributes of the object (slot), the probabilities of opting for that meaning will be greater (Fillmore & Baker, 2010; Lynott & Connell, 2010; Smith, Osherson, Rips, & Keane, 1988). On the other hand, the analogy approach states that the interpretation that has proved valid in similar past combinations will be preferred (Estes & Jones, 2006; Gagné & Spalding, 2006; van Jaarsveld, Coolen, & Schreuder, 1994; see also Gregan-Paxton & John, 1997). According to these approaches, consumers look for congruent associations already existing in their memory when assigning a meaning to a propositionally indeterminate image. Consequently, continuing with the example of fire, the determining factor that would cause the consumer's brain to opt for a specific meaning (literal or metaphorical) would be the congruence of the product with some of these meanings (for an elaboration on congruence/incongruence see Heckler & Childers, 1992). For example, consider a jar of pickles: these can be spicy (i.e. it would be congruent with the metaphorical meaning of fire) but they are not directly related to fire, as they are eaten raw and cold (i.e. it is incongruent with the literal meaning of fire). In that case, we would expect that showing a fire image on a jar of pickles would evoke a metaphorical meaning in the consumer's brain and not literal, as it is the meaning most consistent with that category of product. Thus, we propose:

**H2.** The meaning assigned by the consumer to an image of fire depicted on food packaging will tend to be that which is more congruent with the product attributes.

According to this reasoning, displaying a fire image next to a product opens up two possibilities. If the product category is congruent with any of the possible meanings of fire (e.g. a steak), the consumer will have a previous congruent association accessible in their memory (barbecue) and processing the pairing will require low cognitive effort. However, if the product category is not consistent with any of the possible meanings of fire (e.g. yoghurt), the consumer will not have any prior congruent association accessible in his memory and processing the

<sup>1</sup> It is worth noting that, strictly speaking, for the fire image meaning to be considered purely 'literal', it should refer to nothing but fire itself. However, in the present paper the term 'literal meaning' will be used to intuitively refer to meanings that are directly related to fire (such as *barbecue* or *roast*). Additionally, although both literal and metaphorical meanings may still contain different possible meanings in their interior (e.g. the literal meaning includes concepts such as *barbecue* or *roast*), for the sake of clarity from now on we will refer to the possible meanings for an image of fire depicted on food packaging as being simply 'literal' or 'metaphorical'.

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