



Does the shape of a cup influence coffee taste expectations? A cross-cultural, online study



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ABSTRACT

We report a study designed to investigate whether shape-taste crossmodal correspondences would influence consumers' expectations concerning coffee. To that end, we conducted a cross-cultural online survey with respondents ($N = 309$) from China, Colombia, and the United Kingdom (UK). The participants had to rate eight coffee mugs on eight scales by arranging the mugs within a 1000×250 pixel box, placing each mug so that its horizontal position matched how strongly they thought the mug matched the scale presented. Amongst other findings, the results revealed that (1) the coffee was expected to be more aromatic from narrower diameter mugs, (2) the coffee associated with shorter mugs was expected to be both more bitter and more intense, and (3) the coffee was expected to be sweeter from wider diameter mugs. An interesting cross-cultural finding was that participants from the UK expected the mugs to be hotter than participants from either China or Colombia. These results add to a large and growing body of research highlighting the associations between visual information and a product's likely (or expected) sensory qualities. These findings may be useful to those preparing coffee as they suggest that coffee should be presented in certain mugs in order to convey a message that is congruent with the consumer's expectations.

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1. Introduction

Even before tasting, we have access to, and interpret, various pieces of sensory information concerning foods and beverages (e.g., colour, orthonasal aroma, shape, and sometimes even sound and weight; Prescott, 2015; Spence, 2015a; Spence & Wang, 2015). The role of this information in priming people and setting their sensory and hedonic expectations¹ has been well-established (Yeomans, Chambers, Blumenthal, & Blake, 2008; see also Piqueras-Fiszman & Spence, 2015, for a recent review). Shankar, Levitan, and Spence (2010), for example, demonstrated that the same colour (e.g., blue) elicits different expectations in different groups of people. Specifically, when a group of Taiwanese partici-

pants were shown a clear plastic cup containing a blue liquid, the majority of them expected the liquid to be mint-flavoured – Spence (2015b) suggests that this may be a consequence of an association with mouthwash. However, when the same stimulus was shown to a group of British participants, the majority expected raspberry-flavour instead. Similarly, Shermer and Levitan (2014) found that changing the colour (e.g., from red to blue) of pictures of salsa influenced participants' expectations regarding the salsa's spiciness. However, little is known about expectations when it comes to coffee or, and similar to Shankar et al.'s (2010) work, how expectations in relation to coffee might differ from one culture to the next.

The paucity of research exploring the influence of sensory cues on people's expectations concerning the taste/flavour of coffee is somewhat surprising, especially given Brits, for example, who are

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¹ Consistent with Olson and Dover (1976), an expectation is defined here as “the perceived likelihood that a product possesses a certain characteristic or attribute” (p. 169).

famous for their fondness for tea, consume an estimated 70 million cups of coffee in cafés, restaurants, and other outlets each and every day (Howie, 2012).² Such figures hint at the ubiquity of coffee in many countries (see P. J. W. & D. H., 2013) and, given the economic incentive to keep consumers drinking coffee, café owners, restaurateurs, crockery designers and manufacturers ought, presumably, to be interested in anything that helps enhance the perception of the taste qualities, the enjoyment, or the overall coffee drinking experience for their clientele (cf. Van Doorn, Wullemijn, & Spence, 2014).

1.1. Shape-taste associations

Shape undoubtedly influences consumer behaviour (see Spence, 2012, for a review), and any shapes that are present on, or near, a food or beverage can be used by consumers to assess the likely qualities of that foodstuff. In general, people prefer rounded shapes (e.g., circles) to more angular shapes (e.g., triangles or stars; Bar & Neta, 2006; Gómez-Puerto, Munar, & Nadal, 2015; Silvia & Barona, 2009). Cheskin's (1957) oft-cited research drew attention to the impact of shapes on people's perception of different products. Cheskin placed identical products (e.g., crackers) in two different packages, one adorned with triangles, the other with circles. The participants' task was to state which product they preferred. Eighty-percent of participants reported a preference for the product from the package adorned with circles; often suggesting, when quizzed, that this was of better quality. Westerman et al. (2012) obtained similar results in relation to people's preference for rounded shapes on, and rounded contours of, product packages.

Shape also seems to have a role in the experience when drinking a beverage (see Hanson-Vaux, Crisinel, & Spence, 2013). Demonstrating a tangible impact of shape on drinking, Wansink and Van Ittersum (2003, 2005) found that both children and adults pour around 20–30% more of a drink (e.g., juice) into short/wide glasses relative to tall/thin glasses. However, participants believed the opposite to be true. These authors related this finding to Piaget's conservation task. Specifically, adults fail the task because it appears as though they believe that tall/thin containers hold more fluid than short/wide containers, and thus they pour less fluid into tall/thin containers.

Although associations between shape and taste have been explored in a range of food and beverage products, the correspondence between shape and expectations related to the taste of coffee remain unknown. Coffee is an interesting candidate for research because of its consistent, bitter character and the different bitter/sweet combinations that arise through bean selection, type of roasting of the beans, type of milk used (e.g., full fat), and whether or not sugar is added. According to Spence (2012), coffee is likely to be another product where shape-taste associations exist. The suggestion being that many coffee company logos are rounded in shape (e.g., New York Coffee Company, Costa Coffee, Starbucks Coffee), and that this might be used to suggest to customers that their coffee is not overly bitter (see also Batra, Seifert, & Brei, 2015; Zhang, Feick, & Price, 2006). However, it is important to note that this claim has yet to be substantiated, and Cheskin's (1957) early ideas (i.e., the ability of the shapes used on product packaging to affect people's product expectations) have yet to be applied to the coffee category. This research project addresses this salient gap in the literature. Specifically, and given that, in a restaurant setting, a coffee's package is often the mug or cup in which it is served, we sought to investigate shape-flavour associations in relation to coffee expectations.

² This figure includes the cups of coffee drunk at home and in other locations (e.g., staff tea rooms); approximately 70% of which are instant coffee.

1.2. Cross-cultural research

Interestingly, Bremner et al. (2013) reported that the Himba tribe of Kaokoland in rural Namibia did not show the 'usual' (i.e., Western) associations between angular and rounded shapes and the tastes and oral-somatosensory properties of beverages. It was assumed that the Himba have been unable to accumulate the 'usual' associations through experience because they have not been exposed to written language, supermarkets, or advertising. Bremner et al. found that the Himba did not match still water with an organic, amoeba-like shape, nor did they pair sparkling (i.e., carbonated) water with an angular, star-like shape. Additionally, they also matched chocolates varying in cocoa content in a manner opposite to that of their Western counterparts (i.e., Westerners match chocolate high in cocoa to angular, star-like shapes due to the increased bitterness). That said, Ngo et al. (2013) have observed consistent crossmodal correspondences across cultures. Specifically, they demonstrated that British and Colombian participants associated sweet fruit juices with round shapes and sour fruit juices with angular shapes (see also Salgado-Montejo et al., 2015; Wan et al., 2014). Bremner et al.'s (2013) findings, and the work of others (e.g., Williams & Bargh, 2008), show that at least some of the associations between shapes and the tastes, flavours, aromas, and oral-somatosensory attributes of food and beverages are likely learned. That said, it is possible that participants matched stimuli as a function of stimulus valence, which might differ across cultures (see Velasco, Woods, Petit, Cheok, & Spence, 2016). For example, the Himba might find both chocolate high in cocoa and rounded forms appealing, and thus match them.

1.3. Aims and hypotheses

In the study reported here, we explored the impact of the shape of coffee mugs on people's expectations of the coffee. Most studies on taste/shape associations have focused on the curvilinearity of shapes. However, other shape features (in particular those that affect visual preference) may influence taste/shape associations (as shown by Salgado-Montejo et al., 2015, for symmetry; Derooy & Valentin, 2011, for thinness). Further, and similar to Piqueras-Fiszman, Alcaide, Roura, and Spence (2012), we wanted to explore the influence of the shape of the container the beverage is served in. For those reasons we explored some of the attributes that are typically varied in coffee cups, namely the 'height' of the mug (tall, short), the 'diameter' of the mug (wide, narrow), and the 'thickness' of the rim (thick, thin). It should be noted that factors other than shape can influence expectations as well. For example, the cup in which the coffee is served may affect us as a function of our perception of the general properties of the cup (i.e., cheap vs. expensive (Piqueras-Fiszman, Harrar, Alcaide, & Spence, 2011), flimsy vs. strong (Krishna & Morrin, 2008)). Here, we explore these issues too.

In the remainder of this section, the hypotheses will be discussed according to the type of expectation measured. Specifically, 'bitterness' and 'sweetness' measure expectations relating to the taste of coffee, whilst 'aroma', 'energy', 'temperature', and 'intensity' measure expectations concerning the properties/qualities of coffee. Finally, 'liking' and 'willingness-to-pay' measure people's expectations concerning themselves.

1.3.1. Taste expectations

It was thought that if expectations are affected by a mug's attributes (e.g., height), a coffee's properties (e.g., bitterness) should be rated more favourably when associated with a particular change in that dimension. For example, it is common in several countries to serve more concentrated coffees (e.g., espresso, macchiato) in

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