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Can, cup, or bottle? The influence of beverage vessel on taste and willingness to pay

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ABSTRACT

This study examines the influence of beverage service vessel on taste evaluations and willingness to pay through two experiments, each with four conditions: an aluminum can, a glass cup, a plastic cup, and a glass bottle. Study 1, a virtual scenario-based design with 141 participants, showed that taste expectations and willingness to pay were lowest for the beverage served in the aluminum can and that taste expectations mediated the effect of beverage vessel on willingness to pay. Study 2, a lab-based experiment with 82 participants, assessed taste perceptions and willingness to pay. Study 2 replicated the results of Study 1 in a live context with real consumption, extending the findings from expectations to actual perceptions. Theoretical and practical implications of these results are discussed.

1. Introduction

A consumer's perceptions of product quality, price, and value are generally thought to be fundamental elements in their purchasing behavior and selections (Zeithaml, 1988). Packaging is important to the formation of these perceptions, as the package can be considered a part of the product to the extent that package and product are often indistinguishable until the moment of consumption (Rundh, 2009). Further, consumers rely on symbolic meanings drawn from visual cues derived from packaging, such as size, shape, and color, in order to form opinions about product attributes, even when an attribute (e.g. taste) is unrelated to the visual cue (van Rompay et al., 2017). In the case of foodservice and the restaurant industry, specifically the on-premise sector where food and/or beverages are consumed in the same location they are purchased, "packaging" translates to food presentation and the restaurant's choices of food containers and serviceware, which provide critical tangible cues for the formation of consumer perceptions (Namkung and Jang, 2008; Raajpoot, 2002).

Food quality in restaurants has been researched extensively (Ha and Jang, 2010; Kivela et al., 1999; Kim et al., 2009; Namkung and Jang, 2007; Peri, 2006; Raajpoot, 2002; Sulek and Hensley, 2004), yet remains difficult to study, since the construct of quality is multidimensional and is altered by factors such as consumer experience, consumption context, and characteristics such as the product features, durability, and serviceability (Krishna and Morrin, 2008; Lawless, 1995). Food presentation has also been studied, albeit to a lesser degree, with a focus on visual appeal and the effects of service vessel choices (Kuo and Barber, 2014; Sobal and Wansink, 2007). But, alcoholic and non-alcoholic beverages also serve to enhance the dining experience for the consumer through both their flavors and their presentation (Society of Wine Educators, 2012). Beverages also offer restaurant operators vast potential for profit, as they contribute to an increase in check average and return a higher profit margin than food, thus contributing to both top-line sales and bottom-line profits (Bujisic, 2014; Walker, 2014)

Just as restaurant operators have a myriad of choices for food containers and dishware, they also have a wide variety of container and glassware options for alcoholic and non-alcoholic beverages. For instance, water and carbonated soft drinks, which are the top two liquid refreshment beverage sub-categories in the United States (Beverage Industry, 2017) and standard non-alcoholic restaurant beverage offerings, both require restauranteurs to make decisions regarding presentation. Leading brands like Coca-Cola and Pepsi can be dispensed from a post-mix soda fountain into a glass or plastic cup, or be presented in "ready to drink" bottles and cans (Drysdale, 2015). Water can be served bottled or directly from a filtered tap in a cup or glass. Bottled water, once sold primarily in plastic or glass bottles, is now available in cans due to the introduction of brands like La Croix, which experienced sales of $226 million in 2016 (Peterson, 2016). Further, the rise of premium coffees and teas has extended the presentation options for these beverages beyond the traditional ceramic mug or foam cup to include cans and bottles of different shapes and sizes as well as high-

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quality serviceware (Berry, 2016).

This paper builds on and extends prior research on food and beverage taste perceptions, packaging, and product cues, which suggests the vessel a beverage is served in could alter the consumer's sensory perceptions of the beverage and impact the consumer's attitude towards the product and the brand (Attwood et al., 2012; Barnett et al., 2016; Cavazzana et al., 2017; Piqueras-Fiszman and Spence, 2012; Schifferstein, 2009; Spence and Wan, 2015; Van Doorn et al., 2017; Wan et al., 2015a; Wilcox et al., 2013). Research also indicates that taste is a significant attribute of food quality (Namkung and Jang, 2007) but, as noted by Spence and Van Doorn (2017) in their recent review, few studies have addressed the sensory aspect of taste in regard to beverages and the formation of beverage evaluations. Thus, the central question underlying this research is to what extent visual perceptions of beverage presentation can influence taste perceptions and behaviors. More specifically, to what extent do variations in beverage presentation impact subsequent taste impressions and willingness to pay (WTP) for that beverage?

Two studies were conducted to investigate the effects of beverage service vessel on consumers' evaluation of taste and WTP. In Study 1, we used a scenario-based experiment with four beverage vessels to examine differences in consumers' taste expectations and WTP. In Study 2, we sought to replicate the results of Study 1 in a lab-based experiment through the use of real vessels and beverage product, which allowed us to test taste perceptions, rather than expectations, and WTP.

2. Literature review

2.1. Beverage vessels and taste

Product attributes such as taste, smell and appearance make up the sensory experience during food consumption and therefore are also strongly related to the hedonic dimension of food product quality (Grunert et al., 2000). These attributes are affected through cue diagnosticity, where consumers base decisions on information that is both accessible and analytic. For instance, consumers have been found to use information made accessible through product labels (e.g., "organic") and interpret this information to form perceptions about the taste of the product (Ellison et al., 2016). Relevant to this paper are extrinsic product cues: the characteristics of a product that, when changed, do not alter the physical nature of the product itself (Piqueras-Fiszman and Spence, 2015). Extrinsic cues such as price, which often serves as a signal of product quality, and labels, which provide pertinent information, are fairly obvious, but more subtle cues related to product packaging include color, size, shape, and service container/vessel, all of which also convey information to consumers and allow them to make evaluations and form expectations about the product (Kuo and Barber, 2014; Machiels and Karnal, 2016; Piqueras-Fiszman and Spence, 2012; Zhou et al., 2015).

Formed expectations about a food or beverage based on packaging (made during the purchase decision) are important prior to consumption and contribute to consumer perceptions of sensory characteristics during consumption (Deliza and MacFie, 1996). The process of forming expectations relates to judgmental heuristics, the decision-making shortcuts used by consumers when performing cognitive tasks that influence downstream behaviors including product evaluation, purchasing, and consumption (Provencher and Jacob, 2016). Taste has been found to be one of the most significant factors when evaluating and making purchase decisions of consumable goods (Arvola et al., 1999; Kourouniotis et al., 2016) and is considered a hedonic quality dimension (Grunert et al., 2000). Research on chemosensory systems has identified five dimensions that formulate our evaluation of what most consumers refer to as "taste": sweet, salty, sour, bitter and umami (Chandrashekar et al., 2006). Often used interchangeably with taste is the term flavor. At the scientific level, flavor is made up of both taste and aroma components, along with their interaction (Keast et al., 2004). Within this research, we use the term taste as the overall evaluation of both the taste and flavor components of the consumption experience.

As our sensory perceptions are not limited to a single sense, one could argue that effects of judgmental heuristics on taste may be explained by multiple external cues that influence a variety of senses. For instance, Krishna and Morrin (2008) examined the hardness attribute of a beverage vessel, finding that flimsy cups led to lower taste perceptions. Schifferstein's (2009) results demonstrated that when participants were presented with cups made from different materials, including glass, translucent plastic, and ceramic, ratings of sweetness changed. Responding to Spence and Wan's (2015) call for more research on the effects of surface texture, van Rompay et al. (2017) 3D-printed two different cup exteriors in order to vary surface texture between angular and rounded, and found this change in texture influenced ratings of both bitterness and sweetness.

However, previous research has shown that when there is incongruence between a visual cue and another sensory cue, the visual cue will dominate the formation of taste perceptions (Elder and Krishna, 2010; Hoegg and Alba, 2007). For instance, Zhou et al. (2015) found the color of Asian noodles, a visual cue, influenced taste perceptions such that red noodles were perceived as spicier and yellow noodles as more savory. In the context of beverages, when provided with the same juice that had been darkened with a flavorless food coloring, the color was found to create a significant difference in taste perceptions despite the juices being the same (Hoegg and Alba, 2007). Notably, the monochromatic appearance of most beverages and corresponding lack of textures and details suggest that visual cues are critical to the formation of product perceptions and evaluations (Spence, 2015; Zhou et al., 2015).

As noted by Spence and Wan (2015), the beverage vessel which has received the most attention in this regard is the wine glass [see Spence, 2011 for a review], and much attention is paid in some segments of the restaurant and beverage industries to matching wine varietals to specific glassware. However, results across this body of research indicate the effect of a wine glass on taste only holds when study participants can see and/or interact with the glass, thus suggesting this effect is due to cross-modal associations rather than physio-chemical factors.

More recently, extant research has investigated the relationship between the shape properties of other beverage service vessels, such as cappuccino cups, coffee mugs, and beer glasses, and ratings of taste, aroma, and flavor. The studies that have explored this relationship have largely shown that bitter and sour tastes are more strongly associated with angular shapes, while sweeter flavors are more strongly associated with rounded shapes (Velasco et al., 2016; Spence and Van Doorn, 2017). Further, challenging physio-chemical explanations are the most current findings, which reveal that beverages served in rounded/curved vessels are rated as tasting sweeter and/or fruiter than the same beverage served in a straight-sided glass (Mirabito et al., 2017; van Rompay et al., 2017). Van Doorn et al. (2017) also demonstrated the relevance of vessel height and diameter using coffee mugs, with results revealing short mugs associated with bitterness, narrow mugs associated with stronger aromas, and wide mugs associated with sweetness.

While each of these studies provides valuable insights about shape-taste cross-modal correspondence, they focused on very specific contexts, such as comparing two styles of beer glasses (Mirabito et al., 2017), canned versus bottled beer (Barnett et al., 2016), or a standard cola glass versus a water glass (Cavazzana et al., 2017). For several of the product offerings available to restaurant operators, including soda, water, beer, and tea, there are more packaging and presentation options available. Additionally, as noted by Spence and Van Doorn (2017), the absence of appropriate controls makes it difficult to determine whether it is expectations based solely on visual cues or a combination of visual cues and haptic-tactile properties that are influencing taste perceptions. For example, in Cavazzana et al.'s (2017) study, the differences in weight of the two glasses used as compared to the flimsiness of the