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Effects of perceived quality of container on water and snack intake and dyadic communication

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ABSTRACT

The present study investigated whether the perceived quality of a container affects water and snack intake and the subjective qualities of dyadic conversation between undergraduate students. In the experiment, thirty pairs of participants were randomly assigned to two conditions: the high-quality container (HQ) condition, in which participants were provided with high quality glasses from which to drink water, and the low-quality container (LQ) condition, in which participants used ordinary plastic cups. In each condition, pairs of participants were seated at a table and asked to engage in spontaneous and unstructured conversation about certain topics of their choice while consuming water and snacks. The results demonstrate that a greater amount of water was consumed in the LQ condition than in the HQ condition, while the halo effect of container quality increased the perceived quality of the snacks. Furthermore, the results of the self-evaluation for dyadic conversation revealed that the participants in the LQ condition more often reported their conversations to be cooperative, animated and less clumsy than did those in the HQ condition. These results suggest that the accessibility of a container as derived from its perceived quality affects participants' water and snack consumption and the qualities of dyadic communication.

1. Introduction

Several studies on food-container interaction have indicated that the container affects the consumption and evaluation of the food (e.g., Becker, van Rompay, Schifferstein, & Galetzka, 2011; Dunne, Neargarder, Cipolloni, & Cronin-Golomb, 2004; Hartwell, Edwards, & Beavis, 2007; Hsee, 1998; Kimura et al., 2012; Schifferstein, 2009; Spence & Wan, 2015; Tu, Yang, & Ma, 2015; Wansink, 2004; Wansink, 2006; Wansink & Cheney, 2005). For instance, Schifferstein (2009) explored the influence of the material of a cup (e.g., glass, glazed ceramics, low-density polyethylene) on the experience of drinking various liquid food products and found that different cup materials evoked different experiences. Tu et al. (2015) also examined the influence of the haptic perception of the packaging materials of a beverage on its taste characteristics. Their participants reported an icier perception of cold tea drinks in a glass container than in paper or plastic containers. Furthermore, Becker et al. (2011) found that the shape, curvature and color saturation of lemon yogurt packages affected consumers' evaluations and price expectations of the product. These previous studies mainly focused on what aspects of a container affect perceived tastes of a beverage. On the other hand, relatively little is known about the effects of the appearance of a container on food/beverage evaluation and intake.

One possible approach to exploring the relationship between the appearance of a container and food/beverage intake may be the halo effect. The halo effect occurs when an individual's evaluation of one attribute of an entity strongly influences or biases his or her perceptions of its other attributes (Lee, Shimizu, Kniffin, & Wansink, 2013). For instance, Wansink, Payne, and North (2007) explored the halo effect of brand labels on food intake. In their study, participants who ordered a prix-fixe restaurant meal were given a complimentary glass of wine that had been relabeled to induce either favorable ("new from California") or unfavorable ("new from North Dakota") taste expectations. Participants in the California label condition ate 12% more of their meal and remained at their tables 17% longer than did those in the North Dakota label condition. These results suggest that the halo effect of a brand label on wine impacts participants' intake of accompanying foods as well as their enjoyment of the meal, resulting in longer meal times. It is also apparent that the nature of the location where food and drink are being consumed modulates food acceptance and intake (e.g., Edwards, Meiselman, Edwards, & Lesher, 2003; Garcia-Segovia, Harrington, & Seo, 2015; Meiselman, Johnson, Reeve, & Crouch, 2000). For instance, Edwards et al. (2003) reported that the acceptability of a dish prepared with identical ingredients, following the same recipe and served in a similar manner but at different locations

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varied considerably. Results revealed a hierarchy of locations with 4-star restaurants receiving higher scores than institutional settings. These findings led us to postulate that the perceived quality of a container's design could influence an individual's food intake as do brand labeling and location.

Furthermore, there is a possibility that the perceived quality of a container's design also influences the quality of mealtime communication. Wansink et al. (2007) argued that the halo effect of wine brand had an impact on participants' enjoyment of the mealtime. Previous studies on food-related emotion suggest that pleasant moods during mealtime elicit and modify emotion and social processes, and help people feel comfortable (Köster & Mojet, 2015; Nakata & Kawai, 2017; Sommer, Stürmer, Shmuilovich, Martin-Loeches, & Schacht, 2013). Bova and Arcidiacono (2014) also revealed that people often talk about the quality of prepared foods at mealtime. These findings led us to postulate that the halo effect of container quality could influence the quality of mealtime conversation among participants. It would be worthwhile to explore whether food cognition effects, such as the halo effect, affect not only food consumption, but also social interactions while eating because people often use topics such as their food selection, food consumption and food in general to maintain social relationships with their co-eaters (e.g., Amiraian & Sobal, 2009; Hermans, Larsen, Herman, & Engels, 2008; Mondada, 2009).

Here, we explored whether the perceived quality of a container affects food and beverage intake during dyadic conversation among Japanese young adults. We examined participants' food and beverage intake and their face-to-face communication during conversations in two different situations: the high-quality (HQ) container condition, in which participants used a glass perceived as high quality for drinking water, and the low-quality (LQ) container condition, in which participants used a cup perceived as low quality.

2. Methods

2.1. Design

The experiment was based on a two-independent-groups design (perceived container quality: HQ vs. LQ) with the amount of participant water and snack consumption, behavior related to consumption (number of times water and snacks were consumed and time holding vessel, see Table 2), and subjective evaluation of experimental materials and dyadic communication with their partner (see Table 1) as the dependent variables.

2.2. Participants

Participants were 30 pairs of undergraduate students in Japan (15 females and 45 males, mean age = 20.4 years, SD = 1.2) who were randomly assigned to one of two conditions. All pairs consisted of friends. Gender combinations within pairs were not controlled during recruitment, thus both same-gender and male-female pairs were included in each condition. Despite this variety, we did not find any significant differences in participants' subjective evaluations of closeness to, ease to talk with and kindness for their partner between conditions (closeness: t (58) = 1.19, p = 0.241, ease to talk with: t (58) = 1.45, p = 0.151, kindness: t (58) = 0.23, p = 0.821; Table 1). Furthermore, there were no differences between conditions in demographic variables including age (t (58) = 0.53, p = 0.600), gender (ratio of female: χ^2 (1) = 0.08, p = 0.766) and degree of appetite (t (58) = 0.92, p = 0.362: Table 1).

Participants received a partial course credit or a modest cash payment in exchange for their participation. The study was approved by the institutional ethics committee of Tokyo Denki University.

Table 1
Mean scores (SD) of participant's subjective ratings.

Item	Container quality		Unpaired t-test		
	HQ	LQ	t	p	d
Demographics					
Number of participants	30	30			
Number of females	7 (23.3%)	8 (26.7%)	0.08[1]	0.766	
Age	20.3 (1.3)	20.5 (1.2)	0.53	0.600	
Degree of appetite	3.2 (1.4)	2.9 (1.1)	0.92	0.362	
Drinking vessel					
Quality	2.9 (0.8)	1.8 (0.8)	5.15	< 0.001	1.35
Attractiveness	3.3 (0.9)	2.5 (0.9)	3.05	0.003	0.80
Pitcher					
Quality	3.7 (0.9)	2.2 (0.8)	6.76	< 0.001	1.78
Attractiveness	4.1 (0.7)	2.9 (1.0)	5.26	< 0.001	1.38
Water					
Quality	2.8 (0.9)	2.5 (1.0)	1.10	0.276	
Liking	3.6 (0.6)	3.8 (0.9)	0.97	0.336	
Snack					
Quality	2.9 (0.9)	2.3 (0.9)	2.35	0.022	0.62
Liking	4.0 (1.1)	4.2 (0.9)	0.74	0.461	
Conversation partner					
Closeness	4.7 (0.5)	4.8 (0.4)	1.19	0.241	
Ease to talk with	4.7 (0.5)	4.9 (0.3)	1.45	0.151	
Kindness	4.7 (0.5)	4.7 (0.5)	0.23	0.821	
Impressions of conversation					
Cooperative	4.4 (0.6)	4.8 (0.4)	2.62	0.011	0.69
Favorable	4.7 (0.5)	4.8 (0.6)	0.69	0.492	
Interesting	4.6 (0.6)	4.7 (0.5)	0.72	0.476	
Tense	2.2 (1.1)	1.8 (1.0)	1.46	0.151	
Clumsy	2.1 (0.9)	1.6 (0.8)	2.39	0.020	0.63
Animated	4.2 (0.7)	4.6 (0.6)	2.64	0.011	0.69
Satisfied	4.3 (0.8)	4.6 (0.6)	1.74	0.088	0.46

[1] Results of 2 (gender) × 2 (container quality condition) chi-square test (χ^2 value).

Table 2
Mean scores (SD) of participant's behaviors related to water and snack intake.

Behavior	Container quality		Unpaired t-test		
	HQ (N = 30)	LQ (N = 30)	t	p	d
Water consumption behavior					
Total amount (oz)	3.7 (2.7)	8.3 (5.8)	2.74	p = 0.008	0.70
Number of times consumed	4.5 (4.3)	8.2 (9.3)	1.97	p = 0.053	0.38
Time holding vessel (s)	64.3 (83.7)	144.9 (220.6)	1.84	p = 0.071	0.35
Snack consumption behavior					
Total amount (g)	12.6 (14.3)	23.6 (17.4)	1.83	p = 0.079	0.69
Number of times consumed	13.5 (16.8)	20.8 (21.6)	1.54	p = 0.154	

2.3. Materials and apparatus

The perceived high-quality (HQ) and low-quality (LQ) containers used in this study were selected based on a preliminary survey. In the survey, 30 undergraduate and graduate students (9 females and 21 males, mean age = 20.9 years, SD = 1.2) were asked to rate a list of 6 drinking vessels (color: water-clear, size: from 7.1 to 7.8 oz) on their perceived quality and attractiveness, respectively (5-point scale: 1 = low to 5 = high). The two vessels evaluated as the highest and the lowest quality were selected as stimuli for the main experiment (Fig. 1). The selected HQ vessel (Duralex Picardie glass, capacity: 7.4 oz, weight: 171 g) and LQ vessel (Top-value plastic cup, capacity: 7.3 oz, weight: 5 g) differed significantly in their scores of perceived quality, t (29) = 10.37, p < 0.001, d = 2.30 (M_{HQ} = 3.7 (SD = 1.1); M_{LQ} = 1.7

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