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*Chapter 8*

# EFFECTS OF GENDER-RELATED IMAGES ON BEVERAGES INTAKE FOR YOUNG JAPANESE MEN AND WOMEN

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## ABSTRACT

Advertisements of foods and beverages, particularly packaging and labeling, play an important role in consumption and taste preferences. Commercials in Japan continue to use stereotypical gender roles. In this chapter, we focused on gender associations with regard to beverages. Those associations with individuals' gender identity, including masculinity, femininity, and gender stereotyping, and beverage intake were examined. We conducted a survey on gendered images and beverage intake, and an experiment using the Implicit Association Test, to examine effects of gendered images on the perception of whether a beverage was suitable for oneself. Three hundred and sixty Japanese undergraduate university students (135 men and 225 women) participated in the survey. A questionnaire was used to obtain information about their frequency of beverage consumption, gender personality variables, and lifestyle. Gendered images for commercial messages, and beverage packaging were also collected. The results showed that coffee and isotonic beverages were seen as having masculine images. They also showed that men with high masculinity scores and low femininity scores tended to drink coffee without sugar, while women with high masculinity scores showed increased frequency of isotonic beverage consumption. On the other hand, women with high scores for femininity tended to drink less feminine-imaged beverages (i.e., tea and Japanese tea). The experiments included 20 male and 28 female Japanese undergraduate students. Priming stimuli showed no significant effect on response time. However, participants' response time was shorter when beverages were presented with feminine images than when presented with masculine images, suggesting that feminine images tended to

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influence the assessment of whether a beverage was suitable for oneself. Participants with high femininity scores took time to judge whether beverages with masculine images were appropriate for themselves. It appears that gender personality may influence an individual's intake and choices for specific beverages when they are tied to gendered images.

**Keywords**: masculinity and femininity, gender schema, beverage intake, gendered image, Japanese students

## INTRODUCTION

Gender differences affect choices for food and beverage consumption. According to Japanese cohort studies, women consume more confectionary snacks than do men (Hirokawa, Nagata, Takatsuka, Shimizu, & Shimizu, 2008; Tsugane, Sasaki, Kobayashi, Tsubono, & Sobue, 2001). However, men consume more sugar than women because they drink more sweetened beverages, such as canned coffee, and carbonated and isotonic drinks, whereas women drink more non-sweetened beverages, such as Japanese tea (Owaki, Kurisu, Wada, & Kikuchi, 2001).

Gender differences regarding preferences for sweets were also observed (Laeng, Berridge, & Butter, 1993), and men gave higher pleasantness ratings to sweet tastes than women did (Enns, Van Itallie, & Grinker, 1979) or expressed preferences for more highly sweetened drinks (Conner & Booth, 1988). Accordingly, the study by Yamazawa, Hirokawa, and Shimizu (2007) showed that female preferences for sweet coffee decreased as the density of sucrose increased, whereas the most common choice for men was coffee with 15% sucrose. Men may be less sensitive to sweetness, while women, because of their greater concern for weight gain (Wooley & Wooley, 1983), tend to assign a negative value to sweet cravings (Weingarten & Elstomn, 1991).

Gender differences in taste preferences may be related not only to biological differences but also to other factors, such as variables in gender roles. According to Hyde and Feller (1981), taste thresholds may provide a more physiologic measure of taste sensitivity than intensity judgments; gender differences in supra-threshold responses may be associated with the effects of masculine/feminine traits rather than physiologic causes. The recognition threshold for caffeine was positively associated with scores for masculinity, which was also associated with smoking habits and affinity with bitter tastes (Hirokawa, Yamazawa, & Shimizu, 2006). On the other hand, femininity was associated with preference for sweets (Hirokawa et al., 2006), as well as with restrictive dieting tendencies (Hawkins, Turell, & Jackson, 1983).

Marketing of foods and beverages plays an important role for consumption and taste preferences, particularly packaging and labeling, which provide nutritional information (Engell, Bordi, Borja, Lambert, & Rolls, 1998; Pelchat & Pliner, 1995; Wardle & Huon, 2000). In Japan, the markets for bottled and canned beverages are large, and coffee beverages rank second in volume among beverages, and about 80% of them are sold as canned drinks. The marketing strategies of almost all drink products feature target populations, with target-specific commercial messages. For example, most consumers of coffee are men, and many

commercials for coffee products use masculine images. Suzuki (1995) and Sengupta (1995) have reported that commercials in Japan continue to use stereotypical gender roles.

According to Bem's gender-schema theory, which is a theoretical cognitive structure of sex typing, gender-schematic people apply the category of gender to everything (Bem, 1981). If persons with strong gender schema see a product with a gendered message, they may be attracted to it and become frequent consumers. The study by Morrison and Shaffer (2003) revealed that individuals with traditional gender-stereotypes (i.e., masculine men and feminine women) evaluated products more favorably and had more favorable purchase intentions when the products were endorsed by traditional (i.e., gender-stereotyped) rather than by nontraditional advertisements. Gendered information affected sensory and hedonic ratings; specifically, feminine information intensified sensory and hedonic ratings compared to masculine information (Hirokawa & Yamazawa, 2008). These perceptions may affect taste preferences and food choices.

The objective of this chapter was to examine associations between gender role variables and beverage consumption. We conducted both a survey and an experiment.

In the survey, we examined whether the consumption of beverages with masculine images was associated with individuals of higher masculinity and gender schema, and whether consumption of beverages with a feminine image was associated with individuals of higher femininity and gender schema, after controlling for lifestyle factors.

In the experiment, we examined whether priming gendered images affected participants' perceptions of whether beverages were suitable or unsuitable for themselves, using the implicit association test (IAT) (Banaji, & Greenwald, 1995; Greenwald, & McGhee, & Schwartz, 1998). In the IAT, participants classify stimuli representing gender stereotypes (i.e., masculine and feminine priming images) and evaluative attributes (i.e., suitable and unsuitable) as quickly as they can. The IAT uses response latency to assess the relative strength of the attitude toward which objects are held. The IAT responses are considered automatic because they are expressed without intention or control. Therefore, congruently gendered priming images matched with beverages may facilitate participants' judgment. Stronger masculinity and femininity in individuals may also affect judgment after receiving gendered information.

## Survey on Beverage Intake

### *Methods*

#### Participants

Participants were 360 (135 men and 225 women) Japanese undergraduate university students, who completed all relevant questionnaires. Their average age was 20.3 years (standard deviation [SD] = 3.0). In the questionnaire, questions were posed concerning lifestyle variables, including height, weight, and smoking status, and gender-role inventories, including, the Masculinity-Humanity-Femininity (MHF) scale (Ito, 1978) and the gender-stereotyping score (Dohi, 1999).

The MHF scale consisted of 20 items, including masculinity (10 items, $\alpha$= 0.86) and femininity (10 items, $\alpha$= 0.75). Participants answered each item in terms of how well the item

described their personality, using a 1–5 scale, with 1 being "never true," and 5 being "always true." For the gender-stereotyping score, participants responded to the same items that were on the MHF scale, according to how desirable they were for men or women. The ranking was from 1 to 5, with 1 being "very undesirable," and 5 being "very desirable." The score for the gender-stereotyping was calculated as a summation of the absolute values of differences between each item's rating for men and for women (gender-stereotyping = Σ|rating for men – rating for women|). Height and weight were obtained; body mass index was calculated as weight (kg)/height $(m)^2$. The smoking status (current smoker, past smoker, or never- smoker) was also obtained. Frequency of alcohol consumption and dining out was obtained using the following scale: 1 = "very rarely"; 2 = "1×/month"; 3 = "2–3×/month"; 4 = "1×/week"; 5 = "2–3×/week"; 6 = "4–6×/week"; 7 ="1×/day"; 8 = "2–3×/ day"; 9 = "4×/day or more." Sleep was calculated by recording the times for getting up and going to bed. Frequency of participation in sports activities was assessed by inquiring about the number of times per week. Responses ranged from 0 to 7 and higher. Present physical condition was ranked as "fine" or "below par." Intake of sweet refreshments was assessed by asking whether they ate sweet snacks with coffee or tea. The mean scores for masculinity and femininity, body mass index, and lifestyle factors are detailed in Table 1. The gender differences for those variables are also shown in Table 1.

**Table 1**

Participants' gender role scores and lifestyle variables

| | | Men | Women | |
|---|---|---|---|---|
| | | Mean (SD) | Mean (SD) | |
| N | | 135 | 225 | |
| Masculinity | | 31.0 (6.8) | 28.8 (6.6) | ** |
| Femininity | | 28.9 (5.8) | 27.5 (5.0) | * |
| Gender schema | | 17.0 (10.3) | 14.9 (7.8) | * |
| Body mass index | | 21.3 (3.2) | 20.3 (2.3) | *** |
| Frequency of sports (/week) | | 1.8 (1.6) | 0.9 (1.3) | *** |
| Hours of sleep | | 6.3 (1.1) | 6.4 (0.9) | |
| | | % | % | |
| Smoking status | | | | *** |
| | Current smoker | 29.6 | 6.7 | |
| | Past smoker | 5.2 | 5.3 | |
| | Non-smoker | 65.2 | 88.0 | |
| Frequency of drinking | | | | ** |
| | Very few | 34.1 | 41.3 | |
| | 1-3 / month | 40.7 | 46.7 | |
| | >= 1 / week | 25.2 | 12.0 | |
| Frequency of dinning out | | | | |
| | <= 3 / month | 40.7 | 49.3 | |
| | 1-6 / week | 48.9 | 44.0 | |
| | >= 1 / day | 10.4 | 6.7 | |
| Physical condition | | | | |
| | Fine | 74.8 | 72.9 | |
| | Below par | 25.2 | 27.1 | |
| Sweet refreshments | | | | |

| | | | |
|---|---|---|---|
| | Yes | 29.6 | 37.8 |
| | No | 70.4 | 62.2 |

* $p < 0.05$
*** $p < 0.001$

**Table 2 Frequency of Bevarage Intake By Gender**

| | Men % | Women % | |
|---|---|---|---|
| Coffee (with sugar) | | | *** |
| Very few | 31.1 | 52.0 | |
| 1-3 / month | 22.2 | 17.8 | |
| >= 1 / week | 46.5 | 30.2 | |
| Coffee (without sugar) | | | |
| Very few | 54.1 | 59.1 | |
| 1-3 / month | 11.9 | 14.2 | |
| >= 1 / week | 34.1 | 26.7 | |
| Tea (with sugar) | | | |
| Very few | 37.8 | 45.3 | |
| 1-3 / month | 24.4 | 26.2 | |
| >= 1 / week | 37.8 | 28.4 | |
| Tea (without sugar) | | | *** |
| Very few | 68.9 | 46.7 | |
| 1-3 / month | 14.1 | 26.2 | |
| >= 1 / week | 17.0 | 27.1 | |
| Japanese tea | | | |
| <= 3 / month | 23.0 | 23.1 | |
| 1-6 / week | 39.3 | 36.0 | |
| >= 1 / day | 37.8 | 40.9 | |
| Isotonic drink | | | *** |
| <= 1 / month | 21.5 | 55.6 | |
| >= 2 / month and <= 3 / week | 60.7 | 39.1 | |
| >= 4 week | 17.8 | 5.3 | |

** $p < 0.01$
*** $p < 0.001$

**Beverage Consumption (Table 2)**

The frequency of consumption of coffee with sugar, coffee without sugar, tea with sugar, tea without sugar, Japanese tea, and isotonic drinks was determined by selecting 1 for "very rarely"; 2 for "1×/month"; 3 for "2–3×/month"; 4 for "1×/week"; 5 for "2–3×/week"; 6 for "4–6×/week"; 7 for "1×/day"; 8 for "2–3×/day"; 9 for "4×/day or more." Based on the distribution of beverage consumption, for men, the consumption of coffee with sugar more than 1×/week was categorized as high, and others were low (high = 63; low = 72). For

women, the consumption of coffee with sugar "very rarely" was categorized as low, and other frequencies were high (high = 68; low = 157). For both men and women, "very rarely" for the consumption of coffee without sugar was categorized as low; other frequencies were high for men (high = 46; low = 89) and women (high = 60; low = 165). The consumption of tea with sugar more than 1×/week was categorized as high; other frequencies were low for both men (high = 51; low = 84) and women (high = 64; low = 161). For women, the consumption of tea without sugar more than 1×/week was categorized as high, and other frequencies were low (high = 23; low = 112). For men, the consumption of tea without sugar "very rarely" was categorized as low, and other frequencies were high (high = 61; low = 164). The consumption of Japanese tea 1×/day or more was categorized as high for both men and women; other frequencies were low for men (high = 44; low = 91) and women (high = 84; low = 141). The consumption of isotonic drinks more than 2×/week for men (high = 81, low = 54), and more than 1×/week for women (high = 61, low = 164) were categorized as high.

**Gendered Images for Beverages**

Gendered images for beverages (coffee, tea, Japanese tea, and isotonic drinks) were measured by using the semantic differential technique. The scale was developed by using 21 items selected from masculinity-femininity questionnaires (i.e., Adjective Check List, Heilbrun, 1976; Bem Sex Role Inventory, Bem, 1974; MHF, masculinity-femininity scales by Yamaguchi, 1985). A pilot study was conducted before the current study. From the results, 10 descriptions were taken, which included the following phrases: "powerful-fragile," "hardy-delicate," "not attractive-attractive," "hard-soft," "unique-common," "rough-gentle," "angular-round," "bold-prudent," "coarse-elegant," and "masculine-feminine." Participants were asked to indicate which descriptions used in the commercials and packaging appealed to them. Masculine adjectives were scored 1, and feminine adjectives were scored 5. Higher scores indicated a more feminine image. Internal consistencies were as follows: coffee $\alpha$ = 0.70, tea $\alpha$ = 0.80, Japanese tea $\alpha$ = 0.74 and isotonic drinks $\alpha$ = 0.71.

**Statistical Analyses**

Gender differences in scores of masculinity, femininity, body mass index, frequency of participation in sports, and hours of sleep were examined by using t-tests. Gender differences in smoking status, frequency of alcohol consumption, frequency of dining out, physical condition, consumption of sweet snacks with coffee or tea, and beverage consumption were examined by using chi-square tests.

A 2×4 repeated variance analysis (ANOVA) was performed to examine gender differences in reactions to gendered images on coffee, tea, Japanese tea, and isotonic drinks. Masculinity, femininity, and gender-stereotyping scores for both men and women were categorized based on their tertile scores as high, middle, and low. Men who scored $\geq 34$; $> 34$ to $> 29$; and $\leq 29$ for masculinity, and women who scored $\geq 32$; $> 32$ to $> 26$; and $\leq 26$ for masculinity were classified as high, medium and low, respectively. Men who scored $\geq 32$; $> 32$ to $> 27$; and $\leq 27$ for femininity, and women who scored $\geq 29$; $> 29$ to $> 26$; and $\leq 26$ for femininity were classified as high, medium and low, respectively. Men who scored $\geq 21$; $> 21$ to $> 12$; and $\leq 12$ for gender-stereotyping, and women who scored $\geq 17$; $>17$ to $> 12$; and $\leq 12$ for gender-stereotyping were classified as high, medium and low, respectively. The odds ratios (OR) and 95% confidential intervals (95% CI) for beverage consumption frequency

with regard to to masculinity, femininity, and gender-stereotyping were estimated by using logistic regression analyses, controlling for each variable among the gender-role variables and lifestyle factors.

**Table 3. Participants Gendered Image# for Beverages**

| | Men | | Women | |
|---|---|---|---|---|
| | Mean (SD) | | Mean (SD) | |
| Coffee | 26.1 (5.2) | c | 26.0 (4.8) | c |
| Tea | 34.5 (6.2) | b | 36.5 (5.2) | a |
| Japanese tea | 34.8 (6.7) | b | 36.2 (5.6) | a |
| Isotonic drink | 26.3 (5.4) | c | 25.8 (5.0) | c |

a, b, c indicate a significant difference between different alphabets ($p<0.05$)
# Higher score implies higher feminine image

***Results***

The means and SDs for gendered images on beverages are detailed in Table 3. There were differences among beverages ($F(3, 350) = 238.9$; $P < 0.001$), and there was an interaction effect of gender and beverages ($F(1, 352) = 3.4$; $P = 0.07$). Tea and Japanese tea were scored higher (i.e., more feminine) than coffee and isotonic drinks, and women scored them significantly higher than did men ($P < 0.05$). Although there were statistically significant differences between males and females, the differences were very small and of little practical value.

The odds ratios and 95% CI for associations between gender-role variables and consumption of coffee are shown in Table 4. For men, a high level of gender stereotyping was associated with reduced frequency of drinking coffee with sugar ($P = 0.004$). Men who scored higher in gender stereotyping drank coffee with sugar less frequently ($P$ for trend = 0.01). On the other hand, a middle level of gender stereotyping was associated with increased frequency of drinking coffee with sugar for women ($P = 0.03$). In the consumption of coffee without sugar, men who scored high in masculinity drank coffee without sugar more frequently than those who scored lower in masculinity ($P = 0.01$); $P$ for trend indicated that higher masculinity was associated with more frequent consumption of coffee without sugar ($P$ for trend = 0.04). A middle level of femininity was associated with reduced frequency of drinking coffee without sugar for men ($P = 0.03$); $P$ for trend indicated that higher scores for femininity were associated with less frequent consumption of coffee without sugar ($P$ for trend = 0.04).

The results of tea consumption are shown in Table 5. Women who scored higher in femininity drank less tea with sugar ($P$ for trend = 0.04); a high level of femininity for women was associated with reduced frequent consumption of tea without sugar ($P = 0.02$). A middle level of femininity for women was associated with reduced consumption of tea without sugar ($P = 0.05$). No association between gender variables and tea consumption was observed for men.

The results of the consumption of Japanese tea and isotonic drinks are shown in Table 6. A middle level of femininity for women showed a reduced level of consumption ($P = 0.01$); $P$ for trend also showed that a higher level of femininity was associated with reduced frequency of consumption of green tea ($P$ for trend = 0.01). Women who scored higher in masculinity showed increased consumption of isotonic drinks ($P$ for trend = 0.04), and both high and middle levels of masculinity in women were associated with increased frequency of consumption of isotonic drinks ($P = 0.03$ and $P = 0.01$ for high and middle). No association between gender variables and consumption of isotonic drinks was observed for men.

## Experiment

### *Methods*

#### Participants

Participants were 26 (9 men and 17 women) Japanese undergraduate university students. Their average age was 19.3 years (SD = 1.2). They were recruited as volunteers at the psychological classes. Two or three participants came at a time to the laboratory to participate in this experiment. When they arrived at the laboratory, they were asked to complete a questionnaire. In the questionnaire, questions were posed concerning lifestyle variables, including smoking status and alcohol consumption, and Communion-Agency-Scale (Dohi & Hirokawa, 2004) as a gender-role inventory.

#### Questionnaire

*a) Communion-Agency Scale (CAS)* The CAS was designed by Dohi and Hirokawa (2004) to measure both the positive and negative aspects of agency and communion. In their study, its validity and reliability were examined. A masculinity and femininity scale in the Japanese version (Ito, 1978), which is in almost the same style as the Bem Sex Roles Inventory (Bem, 1974), showed high correlation with the subscales of the CAS. The CAS consists of 24 items, covering agency (6 items, $\alpha = 0.78$), communion (6 items, $\alpha = 0.36$), unmitigated agency (6 items, $\alpha = 0.61$), and unmitigated communion (6 items, $\alpha=0.43$). Chronbach's alpha coefficients of internal consistencies were rather low; however, this may be because of the small sample. Previous studies gave approximately 0.70 for Chronbach's alpha coefficients (e.g., Hirokawa & Dohi, 2007). Participants responded to each item by indicating how well it described their personal situation, choosing from 1 ("not at all") to 4 ("very true"). A higher score indicated a higher tendency for a particular trait.

*b) Beverage image* The 12 major prepared cold beverages were selected by the pre-survey (Table 7). Those beverages were selected from six categories: Japanese tea (green and barley), coffee (coffee and café au lait), English tea (lemon and milk), carbonated drinks (cola and soda), isotonic drinks (marketed as "Pocari-Sweat" and "Aquarius"), and fruit juices (orange and apple). The question was posed to whether the image of beverage was masculine or feminine, by choosing from 1 "very masculine," 2 "somewhat masculine," 3 "somewhat feminine," and 4 "very feminine." Participants were also asked whether the beverage was suitable for themselves, on a scale of 1–4, with 1 being "very suitable"; 2 "somewhat suitable"; 3 "somewhat unsuitable"; and 4 "very unsuitable."

## Table 4. Odds Ratios (95% CI) For Intake of Coffee

| | Coffee (with sugar) | | | | | | Coffee (without sugar) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | | | Women | | | Men | | | Women | | P for |
| | OR | 95% CI | P for trend | OR | 95% CI | P for trend | OR | 95% CI | P for trend | OR | 95% CI | trend |
| Masculinity | | | 0.17 | | | 0.15 | | | 0.04 | | | 0.55 |
| Middle | 0.4 | 0.1-1.1 | | 2.0 | 0.9-4.4 | | 1.7 | 0.5-5.1 | | 1.0 | 0.5-2.4 | |
| High | 0.8 | 0.3-1.9 | | 1.0 | 0.4-2.4 | | 3.9 | 1.4-11.5 | | 1.5 | 0.7-3.4 | |
| Femininity | | | 0.98 | | | 0.16 | | | 0.04 | | | 0.47 |
| Middle | 1.0 | 0.4-2.5 | | 0.6 | 0.2-1.6 | | 0.3 | 0.1-0.9 | | 1.8 | 0.7-4.7 | |
| High | 1.0 | 0.4-3.1 | | 0.5 | 0.2-1.0 | | 1.3 | 0.4-3.9 | | 1.3 | 0.6-2.8 | |
| Gender schema | | | 0.01 | | | 0.07 | | | 0.70 | | | 0.26 |
| Middle | 0.7 | 0.3-1.8 | | 2.5 | 1.1-5.4 | | 1.5 | 0.5-4.6 | | 1.9 | 0.9-4.2 | |
| High | 0.2 | 0.1-0.6 | | 2.0 | 0.9-4.3 | | 1.5 | 0.5-4.5 | | 1.6 | 0.7-3.5 | |

OR was adjusted for BMI, smoking status, drinking, dinning out, refleshments, sports, condition, hours of sleep

Intake of coffee with sugar for men more than 1 / week was categorized as high and others were low. Intake of coffee with sugar for women and coffee with sugar for men and women more than 1 / month was categorized as high and others were low.

**Table 5. Odds Ratios (95 CI) for Intake of Tea**

| | Tea (with sugar) | | | | | | Tea (without sugar) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | | | Women | | | Men | | | Women | | |
| | OR | 95% CI | P for trend | OR | 95% CI | P for trend | OR | 95% CI | P for trend | OR | 95% CI | P for trend |
| Masculinity | | | 0.87 | | | 0.26 | | | 0.32 | | | 0.86 |
| Middle | 0.9 | 0.4-2.4 | | 1.8 | 0.8-4.0 | | 2.8 | 0.7-10.8 | | 1.2 | 0.6-2.8 | |
| High | 0.8 | 0.3-1.9 | | 1.0 | 0.5-2.4 | | 1.8 | 0.5-6.3 | | 1.1 | 0.5-2.4 | |
| Femininity | | | 0.21 | | | 0.04 | | | 0.38 | | | 0.14 |
| Middle | 2.1 | 0.8-5.4 | | 0.4 | 0.2-1.1 | | 0.4 | 0.1-1.6 | | 0.3 | 0.1-1.0 | |
| High | 1.0 | 0.4-2.9 | | 0.4 | 0.2-0.9 | | 0.5 | 0.1-2.1 | | 0.8 | 0.4-1.6 | |
| Gender schema | | | 0.78 | | | 0.27 | | | 0.56 | | | 0.62 |
| Middle | 1.3 | 0.5-3.3 | | 1.9 | 0.9-4.0 | | 1.0 | 0.3-4.0 | | 0.9 | 0.4-1.9 | |
| High | 1.4 | 0.5-3.4 | | 1.2 | 0.5-2.5 | | 1.9 | 0.5-6.8 | | 1.3 | 0.6-2.6 | |

OR was adjusted for BMI, smoking status, drinking, dinning out, refleshments, sports, condition, hours of sleep

Intake of tea with sugar and without sugar for men and women more than 1 / week was categorized as high and others were low.

**Table 6. Odds Ratios (95% CI) for Intake of Japanese Tea and Isotonic Drink**

| | Japanese tea | | | | | | Isotonic drink | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Men | | P for | Women | | | Men | | P for | Women | | |
| | OR | 95% CI | trend | OR | 95% CI | P for trend | OR | 95% CI | trend | OR | 95% CI | P for trend |
| Masculinity | | | 0.17 | | | 0.21 | | | 0.93 | | | 0.04 |
| Middle | 1.3 | 0.5-3.9 | | 1.8 | 0.9-3.9 | | 1.1 | 0.4-2.9 | | 2.9 | 1.2-6.8 | |
| High | 2.6 | 0.9-7.3 | | 1.1 | 0.5-2.3 | | 1.2 | 0.5-3.0 | | 2.7 | 1.1-6.7 | |
| Femininity | | | 0.40 | | | 0.01 | | | 0.29 | | | 0.37 |
| Middle | 0.5 | 0.2-1.6 | | 0.3 | 0.1-0.7 | | 2.2 | 0.8-5.9 | | 1.1 | 0.4-2.9 | |
| High | 1.1 | 0.4-3.2 | | 1.1 | 0.6-2.3 | | 1.4 | 0.5-3.8 | | 0.6 | 0.3-1.4 | |
| Gender schema | | | 0.43 | | | 0.16 | | | 0.46 | | | 0.65 |
| Middle | 1.6 | 0.6-4.6 | | 0.7 | 0.3-1.4 | | 1.8 | 0.7-4.7 | | 1.4 | 0.6-3.2 | |
| High | 0.9 | 0.3-2.4 | | 0.5 | 0.2-1.0 | | 1.4 | 0.5-3.5 | | 1.3 | 0.6-2.9 | |

OR was adjusted for BMI, smoking status, drinking, dinning out, refleshments, sports, condition, hours of sleep

Intake of Japanese tea for men more than 1 / week was categorized as high and others were low. Intake of coffee with sugar for women and coffee with sugar for men and women more than 1 / month was categorized as high and others were low.

**Table 7. Participanys Beverage Images on Beverages**

| | Men | | Women | |
|---|---|---|---|---|
| | Masculine (%) | Feminine (%) | Masculine (%) | Feminine (%) |
| Green tea | 33.3 | 66.7 | 5.9 | 94.1 |
| Barley tea | 66.7 | 33.3 | 76.5 | 23.5 |
| Coffee | 100.0 | 0.0 | 88.2 | 11.8 |
| Café au lait | 11.1 | 88.9 | 17.6 | 82.4 |
| Tea with lemon | 0.0 | 100.0 | 5.9 | 94.1 |
| Tea with milk | 11.1 | 88.9 | 0.0 | 100.0 |
| Cola | 100.0 | 0.0 | 94.1 | 5.9 |
| Soda | 100.0 | 0.0 | 94.1 | 5.9 |
| Pocari Sweat (Ohtsuka Pharmaceutical Co.) | 55.6 | 44.4 | 94.1 | 5.9 |
| Aquarius (Coca-cola, Ltd) | 77.8 | 22.2 | 100.0 | 0.0 |
| Orange juice | 22.2 | 77.8 | 11.8 | 88.2 |
| Apple juice | 0.0 | 100.0 | 11.8 | 88.2 |
| | Suitable (%) | Unsuitable (%) | Suitable (%) | Unsuitable (%) |
| Green tea | 66.7 | 33.3 | 88.2 | 11.8 |
| Barley tea | 88.9 | 11.1 | 76.5 | 23.5 |
| Coffee | 66.7 | 33.3 | 29.4 | 70.6 |
| Café au lait | 77.8 | 22.2 | 58.8 | 41.2 |
| Tea with lemon | 55.6 | 44.4 | 88.2 | 11.8 |
| Tea with milk | 66.7 | 33.3 | 70.6 | 29.4 |
| Cola | 44.4 | 55.6 | 11.8 | 88.2 |
| Soda | 66.7 | 33.3 | 17.6 | 82.4 |
| Pocari Sweat (Ohtsuka Pharmaceutical Co.) | 66.7 | 33.3 | 52.9 | 47.1 |
| Aquarius (Coca-cola, Ltd) | 77.8 | 22.2 | 52.9 | 47.1 |
| Orange juice | 44.4 | 55.6 | 76.5 | 23.5 |
| Apple juice | 44.4 | 55.6 | 94.1 | 5.9 |

## Procedure

The experimenter instructed the participants that they judged whether a beverage on the monitor was suitable for themselves, by pushing the button 1 for "suitable" or 5 for "unsuitable."

The experiment was conducted using a tachistoscope (Iwatsu Co. IS-720). The tachistoscope was programmed to present the words "From now, the experiment starts" for 2500 ms; an attention mark "+" for 1000 ms; blank for 500 ms; a priming stimulus of the words "Bijo (beautiful woman)," "Otokomae (good-looking man)," "Otona (adult)" or "Kodomo (child)" for 500 ms; blank for 500 ms; the word "drinks" for 500 ms; and blank for 500 ms. After this sequence, the name of beverage was presented until the participant pushed the button. The trial was repeated 48 times. The priming stimulus and the names of beverage were presented in random order by the participants.

To examine relationships between matches and mismatches of the priming stimuli and gender-biased assessments of beverages, the averages of response time were calculated for masculine and feminine beverages based on each participant's judgment on the questionnaire. The responses of "very masculine" and "somewhat masculine" were categorized as masculine beverages, and those of "very feminine" and "somewhat feminine" were as feminine beverages. The average response time for a matched image was calculated for the priming stimulus of "good-looking man" and masculine beverages, and for the priming stimulus of "beautiful woman" and feminine beverages. The average response time for a mismatched image was calculated for the priming stimulus of "good-looking man" and feminine beverages, and for the priming stimuli of "beautiful woman" and masculine beverages. If the judgments of "suitable" or "unsuitable" for a beverage were inconsistent between the responses based on the questionnaire and those based on the pushed button, those response times were omitted from the results, as they were presumed to be errors.

The average response times for suitable and unsuitable beverages were also calculated based on the questionnaire. The responses of "very suitable" and "somewhat suitable" were categorized as suitable beverages, and those of "very unsuitable" and "somewhat suitable" were as unsuitable beverages. If the judgments of "suitable" and "unsuitable" for a beverage were inconsistent between the responses based on the questionnaire and those based on the pushed button, those response times were omitted from the results as they were presumed to be errors.

***Results***

To examine effects of matched images between priming stimuli (woman vs. man vs. adult vs. child) and beverages (masculine vs. feminine), a 4×2 ANOVA was conducted. No significant effect was found (Table 8).

Differences of response times between gendered priming stimuli (woman or man) and non-gendered stimuli (adult or child) were calculated. No significant effect was found in those differences of response times (Table 9).

Pearson's correlation coefficients were calculated between participants' agency, communion, unmitigated agency, and unmitigated communion scores, and differences of response time. For difference of response time between gendered priming and the priming stimuli of "child," communion was positively correlated with response time for masculine beverages after the priming of "beautiful woman" ($r = 0.41$, $P < 0.05$). Unmitigated communion was negatively correlated with response times for feminine beverages after the priming of "beautiful woman" ($r = -0.41$, $P < 0.05$) and after the priming of "good-looking man" ($r = -0.39$, $P < 0.05$). There was no significant correlation between gender scores and difference of response time between gendered priming and the priming stimuli of "adult."

To examine effects of priming stimuli (woman vs. man vs. adult vs. child) on judgment (suitable vs. unsuitable), a 4×2 ANOVA was conducted. No significant effect was found (Table 10).

The response time for suitable/unsuitable beverages, the differences of response time between gendered priming and non-gendered priming stimuli were calculated (Table 11). A 2×2 (gendered priming stimuli × suitable/unsuitable beverage) ANOVA was conducted. The main effects of priming stimuli were significant ($F [1, 25] = 5.27$, $P = 0.03$ for differences with "adult"; $F [1, 25] = 5.27$, $P = 0.03$ for differences with "child"). The response time was

**Table 8. Response Time (SD) for Masculine and Feminine Beverage by Priming Stimulus**

| Priming stimulus | Beautiful woman | | Good-looking man | | Adult | | Child | |
|---|---|---|---|---|---|---|---|---|
| Beverages | Feminine | Masculine | Feminine | Masculine | Feminine | Masculine | Feminine | Masculine |
| Men | 731.0 (225.7) | 745.6 (286.5) | 759.3 (311.1) | 742.1 (323.3) | 659.5 (186.6) | 753.1 (300.5) | 662.1 (234.6) | 713.9 (259.2) |
| Women | 734.1 (373.6) | 802.3 (363.7) | 803.3 (381.6) | 795.3 (353.0) | 791.1 (417.3) | 824.6 (417.3) | 814.3 (352.0) | 789.9 (443.1) |

**Table 9. Difference of Response Time (SD) Between Gendered and Non-Gendered Priming Stimulus for Masculine and Feminine Beverages**

| Priming stimulus | Beautiful woman - Adult | | Good-looking man - Adult | | Beauty - Child | | Studmuffin - Child | |
|---|---|---|---|---|---|---|---|---|
| Beverages | Feminine | Masculine | Feminine | Masculine | Feminine | Masculine | Feminine | Masculine |
| Men | 35.5 (98.6) | -7.6 (112.0) | 63.8 (198.8) | -11.0 (67.2) | 68.9 (129.9) | 31.7 (187.8) | 97.2 (227.8) | 28.2 (199.8) |
| Women | -57.0 (116.3) | -22.3 (194.0) | 12.2 (100.0) | -29.2 (167.0) | -80.2 (165.7) | 12.3 (261.9) | -11.0 (157.8) | 5.4 (234.5) |

**Table 10. Response Time (SD) for Suitable and Unsuitable Beverages by Priming Stimulus**

| Priming stimulus | Beautiful woman | | Good-looking man | | Adult | | Child | |
|---|---|---|---|---|---|---|---|---|
| Beverages | Suitable | Unsuitable | Suitable | Unsuitable | Suitable | Unsuitable | Suitable | Unsuitable |
| Men | 810.3 (340.4) | 844.1 (457.0) | 855.9 (425.3) | 820.6 (412.7) | 944.7 (717.6) | 780.1 (297.2) | 802.8 (306.8) | 914.9 (653.8) |
| Women | 721.3 (282.6) | 688.1 (207.2) | 743.5 (303.7) | 788.2 (360.5) | 735.3 (255.0) | 765.7 (299.8) | 721.7 (246.2) | 683.6 (203.4) |

**Table 11. Difference of Response Time (SD) between Gendered and Non-Gendered Priming Stimulus for Suitable and Unsuitable Beverages**

| Priming stimulus | Beautiful woman - Adult | | Good-looking man - Adult | | Beauty - Child | | Studmuffin - Child | |
|---|---|---|---|---|---|---|---|---|
| Beverages | Suitable | Unsuitable | Suitable | Unsuitable | Suitable | Unsuitable | Suitable | Unsuitable |
| Men | 64.0 (210.5) | -134.4 (397.6) | 40.5 (181.1) | -88.8 (327.6) | -70.8 (717.6) | 7.4 (297.2) | -94.3 (306.8) | 53.1 (653.8) |
| Women | -77.6 (273.2) | -14.0 (109.3) | 22.5 (312.6) | 8.2 (120.5) | 4.5 (144.3) | -0.5 (134.6) | 104.6 (219.4) | 21.8 (205.3) |

shorter when beverages were presented after "beautiful woman" (M = –42.1, SE = 26.3 for differences with "adult"; and M = –9.7, SE = 21.4 for differences with "child") than after "good-looking man" (M = 1.7, SE = 30.3, and M = 34.2, SE = 29.2, respectively). When the associations were adjusted for gender, there was no significant effect; however, tendencies toward significant effects of priming stimuli were shown (F (1, 24) = 3.32, $P = 0.08$ and F (1, 24) = 3.32, $P = 0.08$, respectively). The response time was shorter when beverages were presented after "beautiful woman" (M = –40.5, SE = 28.2 for differences with "adult"; and M = –14.8, SE = 22.7 for differences with "child") than after "good-looking man" (M = –4.4, SE = 32.2, and M = 21.3, SE = 30.1, respectively).

Pearson's correlation coefficients showed that unmitigated communion was negatively correlated with difference of response time between "beautiful woman" and "child" for suitable beverages (r = –0.41, $P < 0.05$) and for unsuitable beverages (r = –0.50, $P < 0.05$).

## CONCLUSION

Beverage consumption is affected by gender differences, and the present study revealed that gender-role variables may be related to these differences. Men drink more coffee with sugar than women do; however, men who scored higher in masculinity and those who scored lower in femininity consumed coffee without sugar more frequently. Women who scored higher in the gender-stereotyping showed a tendency to drink more coffee with sugar than those who scored lower. On the other hand, men who scored higher in gender stereotyping consumed coffee with sugar less frequently. Men also consumed more isotonic drinks than women. Women who scored higher in masculinity often consumed isotonic drinks. Coffee and isotonic drinks were evaluated as to having masculine images compared to English and Japanese teas. Women drink more tea without sugar than men. However, women who scored higher in femininity drank English and Japanese teas less frequently than those who scored lower in femininity.

In the described survey, consumption of masculine imaged beverages such as coffee and isotonic drinks was related to masculinity. Persons with a high score in masculinity were less sensitive for caffeine (bitterness) (Hirokawa et al., 2006). Because persons with a high score in masculinity were attracted by masculine images, they may consume bitter tastes with masculine images and accustom to bitter tastes. Gender stereotyping scores were also related to coffee consumption. The gender stereotyping score was designed to evaluate individuals' tendencies toward gender-biased judgment (Dohi, 1999). As Hirokawa & Yamazawa (2008) suggested, it is possible that different types of information influence these decisions in coordination with individual differences such as psychological traits and, with affinity to the given information, gender-biased judgments may affect beverage consumption.

Our experiment was conducted to investigate effects of gendered images on perception of beverages. Participants judged beverages as suitable or unsuitable for themselves more quickly when associated with feminine images than with masculine images. Femininity levels, especially unmitigated communion, were associated with speed of judgment; specifically, those participants showing a higher level of femininity (unmitigated communion) judged beverages quickly.

Gender differences in preferences may be mediated by gendered information, individual beliefs, and attitude toward gender roles. Hirokawa & Yamazawa (2008) examined the effects of gendered information on sensory, pleasantness, and familiarity ratings for teas in Japanese female students. Their results indicated that feminine information increased ratings compared to masculine information. In their results, gender-related traits may also influence sensory and hedonic ratings. Furthermore, this experiment revealed that feminine images facilitated the perceptual process as to whether beverages were suitable or unsuitable. Additionally, gender-related personality traits, specifically femininity, may also be influential on the information process. How speed of perception of beverage images affects individuals' food choices should be clarified in future studies.

The marketing of beverages is frequently oriented to target populations (gender, age); therefore, their marketing sometimes includes strongly gendered images. Gender-role factors may have a psychological influence on the selection of beverages. Information may play an important role in food choices and taste preferences (Engell et al., 1998; Pelchat & Pliner, 1995; Wardle & Huon, 2000). Renn and Calvert (1993) examined the relationships between gender schemas and the recall of gendered television messages. They suggested that individuals who retained stereotypes tended to remember information that confirmed their schemas and dismiss information that might disconfirm them. Accordingly, individuals with traditional gender stereotypes had more favorable purchase intentions for the products endorsed by gender-stereotyped advertisements (Morrison & Shaffer, 2003).

The work examined in this chapter has several limitations. The associations between gender-related personalities and beverage consumption did not indicate consistent and hypothesized direction between men and women. One reason may be that the criteria to determine high and low consumption were not clearly defined. Other lifestyle factors, which are potential confounders, may not have been measured. The participants were young students, and most of them were under 20 years of age. Their use of tobacco products and alcohol consumption were very low. If participants had been adults over the age of 21, the results might have been different. For experiment, the word messages were used as the priming gendered-images. To operate the priming gendered-images, visualized images such as pictures may be more influential. Gender-related personality was measured by questionnaires. The validity and reliability were examined for the questionnaires. However, biological indices for masculinity and femininity, including testosterone and estrogen levels, may be influential on taste sensitivity, and may be associated with food preferences. An appropriate index of gender-related factors should be used to examine relationships to beverage consumption.

This survey and experiment were conducted in Japan. The gender schema is a product of culture and, in this case, was inevitably affected by the Japanese culture, which is considered to have strong stereotypical gender roles (Hirokawa, Dohi, Vannieuwenhyse, & Miyata, 2001; Hofstede, 2001). If this work had been conducted among individuals from other cultures, the results might have been different, depending on the acceptance of stereotypical gender roles. For future studies, cultural differences in beverage consumption related to gender role variables should be conducted by considering the limitations listed above.

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