Development of the Five Factor Drinking Motive Questionnaire for Japanese (DMQ-J)

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Abstract

In the present study, we developed a Drinking Motive Questionnaire (DMQ-J) composed of 19 items to clarify the drinking motives of Japanese adults. Exploratory factor analysis revealed the following five reliable factors or subscales of drinking motives: "Coping" (drinking to regulate or reduce internally generated negative emotions), "Enhancement" (drinking to enhance internal positive mood), "Social" (drinking to obtain positive social, and thus external, rewards), "Meal" (drinking to enjoy one's meal), and "Restraint" (reasons to restrain one's drinking). Based on analysis of DMQ-J data from 1000 light-to-moderate drinkers, males scored higher than females on the "Coping" and lower on the "Restraint" subscales, which suggests that males have a relatively unhealthy drinking style. Moreover, females scored marginally higher than males on the "Meal" subscale, which suggests that females enjoy alcohol with their meal, but not to an unhealthy degree. In terms of generational differences, "Social" motive scores decreased but "Meal" motive scores increased with increases in age, suggesting that older people drink to enhance their internal pleasure and enjoy their meals, but not to obtain social rewards.

Key Words: Alcohol, Drinking motives, General population, Gender difference, Generational difference

Why do people drink alcohol? Numerous studies have tried to answer this question. For example, Cox and Linger (1988, 1990) proposed a categorical model of drinking motives that consisted of two dimensions: valence (positive vs. negative) and source (internal vs. external) of the outcomes induced by drinking. By combining these two dimensions, drinking motives can be divided into the following four different subcategories: (a) to enhance internal positive mood; (b) to obtain positive social, and thus external, rewards; (c) to regulate or reduce internally generated negative emotions; and (d) to avoid social rejection. Based on Cox and Linger's model, Cooper (1994) named each subcategory as follows, respectively: Enhancement (EM); Social (SM); Coping (CM); and Conformity (CFM).

Although researchers have investigated drinking motives for their own research purposes (e.g., Adams, Kaiser, Lynam, Charnigo, & Milich, 2012; Anderson, Grunwald, Bekman, Brown, & Grant, 2011; Fernandes-Jesus, Beccaria, Demant, Fleig, Menezes, Scholz, de Visser, & Cooke, 2016; Hasking, Lyvers, & Carlopio, 2011; Kong & Bergman, 2010; Kuntsche & Cooper, 2010), it seems that two important motives have been ignored: one is to enhance the pleasure derived from a meal and the other is to suppress unhealthy drinking behavior.

The ties between alcohol and meals are strong in many cultures. In France, it is commonly said that "a meal without wine is like a day without sunshine." In Japan, the word "*ban-shaku*" refers to drinking alcohol with the evening meal. During *ban-shaku*, many Japanese drink with small dishes before eating steamed rice with a main dish to finish the meal. *Ban-shaku*, as the first half of the meal, plays an important role in enriching, enhancing, and perfecting one's dinner.

The motive to suppress unhealthy drinking behavior should also be considered. Social drinking in Japan, as well as in other countries, plays an important role in promoting interpersonal relationships; however, personal impressions are exacerbated when drinking leads to disgraceful behavior. Therefore, it is socially important to avoid excessive drinking, especially for most Japanese because of their reported genetic difficulties in breaking down alcohol (e.g., Stamatoyannopoulos, Chen, & Fukui, 1975). Accordingly, drinking behavior is also controlled by the motive to suppress this type of unhealthy behavior.

Imada and Suzuki (2000) developed a scale to clarify the drinking motives of Japanese. First, they asked 144 Japanese undergraduates, both male and female, to freely describe their reasons for drinking and/or not drinking alcohol. Their responses generated 217 descriptions, which were sorted and grouped by the researchers based on the similarity of their content. Finally, 66 items were retained, and a drinking motive scale was constructed in such a way that respondents could rate each question item on a 4-point Likert scale. Imada and Suzuki (2000) administered their scale to 96 adult males (age range, 20–49 years) and, using factor analysis, identified the following five drinking-related factors: 1) Meals (Drinking to enrich one's meal); 2) Coping (Drinking to cope with stressors); 3) Avoiding-Sickness-Restraint (Restraining one's drinking to avoid getting sick); 4) Social (Drinking to enhance interpersonal relationships); and 5) Avoiding-Obesity-Restraint (Restraining one's drinking to avoid obesity); the factor of Conformity suggested

by Cooper (1994) was not identified.

However, their drinking motive scale had several problems. First, it was standardized only for males. Second, the 66 items comprising the scale seemed too numerous to be used effectively in combination with other scales or experimental procedures for the further study of drinking behavior. Third, the scale had two inhibitory factors involving drinking restraint: Avoiding-Sickness-Restraint and Avoiding-Obesity-Restraint. This was problematic because the latter should be considered in the context of eating rather than drinking behavior.

Therefore, in the present study, based on Imada and Suzuki's (2000) original scale, we developed a short form of the drinking motive questionnaire for Japanese (DMQ-J) by extracting four items with high factor loadings from five factors, excluding the factor of Avoiding-Obesity-Restraint to resolve these problems. We then conducted an online survey using the DMQ-J and other demographic and alcohol-related questions to assess the validity of the DMQ-J with a particular focus on gender-specific differences.

Methods

Respondents. Responses were received from 1000 Japanese adults (500 males, 500 females; age range, 20–69 years) recruited by a private research agency (Cross Marketing Co., Tokyo, Japan) from a pool of 1.8 million respondents. Consent was obtained from all respondents to participate in an online survey and provide demographic data and attitudes concerning alcohol drinking. Upon completion of the survey, respondents obtained reward points that they could redeem for selected items on the Internet or elsewhere. We were not informed about the quantity of points to be rewarded.

Procedure. The survey was conducted in August 2012 on a custom website designed by the research agency. All respondents completed the DMQ-J and a number of items regarding demographic characteristics and alcohol-related behavior. The DMQ-J was composed of 20 items related to drinking motives for which respondents provided their answers on a 4-point Likert scale (strongly agree, moderately agree, moderately disagree, and strongly disagree). The following demographic characteristics were measured: age, sex, residential area in Japan, marital status, number of people living together, household income, and occupation. Items regarding alcohol-related behavior included the number of drinking opportunities per week, quantity of drinking per opportunity, and favorite type

of alcoholic drink, such as beer, sake, or wine.   The details of additional characteristics are not reported here because they had no relevance to the present study.

Results

Respondents' characteristics related to alcohol drinking.   Health Japan 21, a health promotion plan implemented by the Japanese Ministry of Health, Labour and Welfare (2000), recommended consuming less than 20 g/day of alcohol for both males and females. Based on the responses regarding alcohol-related behavior, 297 male (59.4%) and 410 female (82.0%) respondents reported drinking below that value; therefore, our respondents were characterized primarily as light-to-moderate drinkers.

Scale development.   All 20 DMQ-J items in the survey were originally included in the analysis of the scale structure of the DMQ-J.   Because this was an exploratory factor analysis aiming to develop a scale that intended to examine various differences among the sample, a factor loading of 0.40 was set as the inclusion level to retain a single item as part of a factor.   The first factor analysis with Varimax rotation revealed that one item ("I am concerned about gaining weight if I drink alcohol") did not load well with the other items, so that item was excluded from the next analysis.   A second factor analysis was then conducted with the remaining 19 items, revealing five factors that fit well with the total sample and had adequate internal consistency (see Table 1).   These five factors were then named based on the items that loaded more strongly on each factor.   The "Coping" motive was utilized for the four items that dealt with behaviors associated with drinking as a coping mechanism to mitigate stressful situations.   The factor loadings for these four items ranged from 0.823–0.626.   The "Enhancement" motive was utilized for the four items that dealt with feelings after drinking, such as pleasure and excitement.   The factor loadings for these four items ranged from 0.764–0.596.   The "Social" motive was utilized for the four items that dealt with social drinking for pleasure and fostering human relations.   The factor loadings for these four items ranged from 0.829–0.557.   The "Meal" motive was utilized for the four items that dealt with drinking for enjoyment and enrichment of meals.   The factor loadings for these four items ranged from 0.752–0.660.   Finally, the "Restraint" motive was utilized for the three items that dealt with behaviors and/or reasons to restrain one's drinking.   The factor loadings for these four items ranged from 0.748–0.514.

Table 1.

Exploratory factor analysis of the Drinking Motive Questionnaire for Japanese (DMQ-J) with Varimax rotation.

Item #	Items	Factor 1 Coping	Factor 2 Enhancement	Factor 3 Social	Factor 4 Meal	Factor 5 Restraint	Communality	α
18	I usually drink when I feel irritated or upset.	**0.823**	0.095	0.081	0.051	-0.029	0.697	
16	I drink to forget something awful.	**0.763**	0.170	0.096	0.028	-0.043	0.622	
9	I sometimes drink to calm my mind.	**0.720**	0.166	0.083	0.139	0.060	0.575	
3	I sometimes drink to ease tension.	**0.626**	0.234	0.103	0.134	0.059	0.479	0.878
17	I like how drinking makes me feel.	0.190	**0.764**	0.199	0.023	-0.101	0.670	
1	I like comfort I feel after drinking.	0.151	**0.743**	0.177	0.117	0.069	0.625	
19	I like the uplifted feeling I get after drinking.	0.201	**0.660**	0.315	0.064	-0.039	0.581	
8	I drink to get moderately drunk.	0.208	**0.596**	0.147	0.167	-0.043	0.450	0.837
2	I like drinking with my friends and/or colleagues.	0.042	0.144	**0.829**	0.067	0.003	0.715	
6	When a project is successfully completed, I like to go out with my colleagues to have a few drinks and celebrate.	0.100	0.207	**0.746**	0.090	0.042	0.619	
12	I like drinking in a group.	0.027	0.195	**0.685**	0.067	-0.025	0.514	
15	I sometimes drink with others to develop good personal relationships with them.	0.192	0.129	**0.557**	0.127	0.032	0.381	0.823
20	At mealtime, I decide what kind of liquor to drink based on its pairing (agreeableness) with the dish.	0.124	-0.002	0.091	**0.752**	0.080	0.596	
14	I choose the kind of liquor to drink according to the meal of the day.	0.169	-0.050	0.117	**0.748**	0.109	0.617	
10	I drink to better enjoy a delicious meal.	0.048	0.226	0.100	**0.714**	0.126	0.590	
5	I think liquor is something to drink with a good meal.	0.004	0.195	0.050	**0.660**	0.147	0.498	0.828
4	When I drink, I am careful not to drink too much.	-0.048	0.059	0.013	0.098	**0.748**	0.575	
13	When I drink, I take precautions so that I do not get a hangover.	-0.014	0.029	0.027	0.124	**0.714**	0.527	
11	I am careful not to appear drunk in front of others.	0.087	-0.163	-0.007	0.130	**0.514**	0.315	0.695
	Eigenvalue	5.14	2.58	2.07	1.55	1.44		
	Contribution rate	27.08%	13.59%	10.91%	8.14%	7.58%		
	Cumulative contribution rate	27.08%	40.67%	51.59%	59.73%	67.30%		

The 7th item ("I am concerned about gaining weight if I drink alcohol") was excluded from the second factor analysis because of its low loading in the first factor analysis.
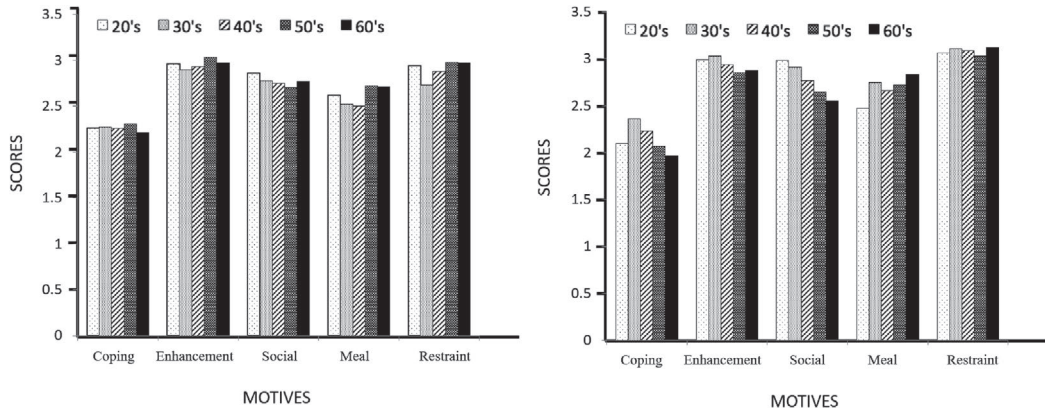
Figure 1
Means scores for each drinking motive across age groups as measured using the
DMQ-J (left: males, right: females).
CM = Coping Motive; EM = Enhancement Motive; SM = Social Motive; MM = Meal
Motive; and RM = Restraint Motive.

**Mean differences of scores for each drinking motive in the DMQ-J across gender
and age groups**.　Figure 1 shows the mean scores for each motive measured by the
DMQ-J across gender and age groups.　A two-way analysis of variance (Gender ×
Generations) was conducted on each score of five different motives to probe significant
effects.　A significant gender difference was found for both the "Coping" and "Restraint"
motives　$(F_{(1, 990)} = 5.32,$　$p < 0.05,$　$\eta^2 = 0.01;$　$F_{(1, 990)} = 8.22,$　$p < 0.01,$　$\eta^2 = 0.02,$
respectively).　Males showed higher scores than females on the "Coping" motive, but
lower scores on the "Restraint" motive.　A marginally significant gender difference, with
females showing higher scores than males, was also observed for the "Meal" motive
$(F_{(1, 990)} = 2.92, p < 0.10, \eta^2 = 0.00)$.　No significant gender differences were observed for
the other motives, namely the "Enhancement" and "Social" motives.　A significant
generational difference was observed for the "Social" and "Meal" motives $(F_{(1, 990)} = 5.32,$
$p < 0.01, \eta^2 = 0.02; F_{(1, 990)} = 3.45, p < 0.01, \eta^2 = 0.01,$ respectively).　As shown in Figure 1,
"Social" motive scores appeared to decrease with increases in age for both males and
females, but "Meal" motive scores, especially those for females, gradually increased with
increases in age.　A marginally significant generational difference, with females showing
a gradual decrease with increases in age, was also observed for the "Coping" motive
$(F_{(1, 990)} = 2.34, p < 0.10, \eta^2 = 0.00)$.　No significant generational differences were observed
for the other motives, namely the "Enhancement" and "Restraint" motives.　Marginal

significance was observed in the interaction between gender and generation, but only for the "Social" and "Meal" motives ($F_{(4, 990)} = 2.15$, $p < 0.10$, $\eta^2 = 0.01$; $F_{(4, 990)} = 1.99$, $p < 0.10$, $\eta^2 = 0.01$, respectively).

To further explore those gender and generational differences, the effect of generation on both genders was analyzed using one-way analysis of variance. For males, only the "Restraint" motive revealed a significant difference ($F_{(4, 495)} = 2.55$, $p < 0.05$, $\eta^2 = 0.02$). Furthermore, a Tukey-Kramer multiple comparison procedure revealed a significant generational difference between the 30s and 50s ($p < 0.05$), with those aged in their 50s having higher scores than those aged in their 30s. For females, significant generation differences were observed for the "Coping", "Social", and "Meal" motives ($F_{(4, 495)} = 3.78$, $p < 0.01$, $\eta^2 = 0.03$; $F_{(4, 495)} = 2.55$, $p < 0.01$, $\eta^2 = 0.05$; $F_{(4, 495)} = 3.55$, $p < 0.01$, $\eta^2 = 0.03$, respectively). For the "Coping" motive, a significant difference was observed between those in their 30s and those in their 60s ($p < 0.01$), with those in their 30s having higher scores than those in their 60s. For the "Social" motive, a gradual decrease in scores was observed with increases in age; this effect was confirmed by significant differences in the Tukey-Kramer test between those in their 20s and 50s, 20s and 60s, and 30s and 60s (all $p < 0.01$). Finally, for the "Meal" motive, a significant difference was observed between those in their 20s and those in their 60s ($p < 0.01$), with those in their 60s having higher scores than those in their 20s.

Discussion

In the present study, we developed the DMQ-J to measure drinking motives among Japanese adults based on the original scale of Imada and Suzuki (2000). The final DMQ-J was composed of 19 items. An exploratory factor analysis revealed the following five reliable factors or subscales of drinking motives: "Coping"; "Enhancement"; "Social"; "Meal"; and "Restraint". An analysis of data from 1000 light-to-moderate drinkers showed that males scored higher on the "Coping" and lower on "Restraint" subscales than females, suggesting that males more frequently engaged in unhealthy drinking behavior. Moreover, females scored marginally higher than males on the "Meal" subscale, which suggests that females enjoy alcohol with meals, but not to an unhealthy degree. Regarding generational differences, "Social" motive scores decreased and "Meal" motive scores increased with increases in age, suggesting that older people drink to enhance their internal pleasure and

enjoy their meals, but not to obtain social rewards.

One of the strengths of the present study was that our sample examined gender and generational differences regarding drinking motives for a wide range of ages (20s to 60s). Many conventional studies on drinking motives have been carried out using university students, who are only in the initial stages of their drinking experiences. Developing drinking motive scales using such young samples seems inadequate because motives for drinking alcohol differ across generations. Moreover, there seems to be a certain limit as to what can be generalized from student data.

The other strength of our sample is that most of the respondents were light-to-moderate drinkers; few heavy and problematic drinkers (alcohol consumption of more than 60 g/day) were included. Although conventional studies on alcohol drinking have primarily focused on clinical problems, several studies have suggested that light-to-moderate drinkers have low levels of psychological distress and a high reported quality of life (e.g., Mathiesen, Nome, Eisemann, & Richter, 2012; Riise, Moen, & Nortvedt, 2003). When considering the relationship between health and drinking behavior, the concept of healthy drinking behavior should be also considered.

This study did have some limitations. First, our newly developed DMQ-J does not contain a subscale for the "Conformity" motive (CFM) included in Cox and Linger's original model (1988, 1990) and the ensuing several drinking motive scales. The CFM represents the motive to avoid social rejection and/or to maintain group cohesiveness by grudgingly joining a drinking party. This limitation was likely the result of the procedure used to collect preparatory question items at the very first stage of scale development by Imada and Suzuki (2000). They simply asked undergraduates the reasons they drank and/or did not drink alcohol. If they had added a question such as "Has there ever been an occasion at which you drank alcohol against your will?", they would have obtained a different type of negative drinking motive. Another possible explanation for the omission of the CFM in Imada and Suzuki's original work is that alcohol-related harassment problems were noted among university students around the year 2000, and since that time, many universities have been carrying out awareness campaigns to prevent such behavior. If these campaigns have been successful, the CFM would not be a behavioral norm for most undergraduates. However, the CFM should be included in the next version of the DMQ-J in order to conduct a longitudinal study that compares the valence of the CFM across generations.

Another limitation of the present study is that the effect sizes obtained from the analysis of gender and generational differences were all negligibly small. This might have been due to the fact that most of the respondents were light-to-moderate drinkers. If more light-to-heavy drinkers are included in a future survey, results with greater reliability could be expected.

Taken together, our newly developed DMQ-J revealed a number of interesting aspects regarding Japanese drinkers; however, further studies are needed to allow a better understanding of universal drinking motives because these are largely dependent on time and place.

Acknowledgments

Author Contributions

SI and HI designed the study, collected the data, and conducted the first data analysis; IF conducted the secondary data analysis and wrote the first draft; all authors contributed to and approved the final version of the manuscript for submission.

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