

# Differences in Self-Assessment Regarding Eating Behaviors among Female University Students Living in Japan, Korea, and Austria

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Received September 20<sup>th</sup>, 2012; revised October 18<sup>th</sup>, 2012; accepted October 26<sup>th</sup>, 2012

## ABSTRACT

**Objective:** To investigate cross-cultural differences in self-assessments of eating behaviors of female university students who bear responsibility for their own eating behaviors and who will, in the future, likely determine a family's eating style. **Design:** A cross-cultural comparison. **Setting:** Japan, South Korea, and Austria. **Subjects:** Female university students from Japan (n = 276), Korea (n = 103), and Austria (n = 127). The survey comprised a questionnaire containing ten sections about eating behaviors (eating habits, regular meal times, and frequency of food intake) and eating attitudes. **Results:** Eating behaviors and attitudes differed significantly among the three cultures. Japanese students practiced healthier eating behaviors than did Korean and Austrian students, on the basis of their variety of food intake and regular consumption of three meals, but rated themselves lower on healthy eating behaviors. Austrian students tended to have more independent attitudes toward eating and food preparation (e.g., "I want to eat only my favorite dishes") than Japanese or Korean students. **Conclusions:** Effects of cultural differences in psychological processes, such as self-cognition, emotion, motivation, and values, on self-assessment of eating behaviors is suggested.

**Keywords:** Eating Behavior; Self-Assessment; University Students; Cross-Cultural Differences; Cultural View of the Self

## 1. Introduction

Several attempts to teach children and adults the importance of eating proper meals and adherence to "Food Education (Shokuiku) Basic Law" [1,2] in order to improve dietary behavior have been conducted at educational institutions in Japan. Similar nutritional programs have also been instituted in South Korea (Korea) [3], America [4], and European Union (EU) countries [5,6]. The establishment of healthy dietary behaviors to curb increased levels of lifestyle-related illness is an important issue in industrialized nations.

For a young adult, university matriculation is a time of leaving home and assuming responsibility for one's own behaviors, including those involving eating habits and cooking skills. During this period, attitudes toward eating play an important role in the maintenance of a student's health [7], and eating behaviors learned during this time

may affect future generations when the students raise their own children.

Eating behavior is strongly influenced by the cultural sphere. It is well known that Western and Japanese meals differ in style and content. The structural systems of attitudes and behaviors toward eating differ considerably across cultures, as well. Although, individuals are generally not conscious of these cultural influences.

Cultural differences exist in terms of self-perception, and these differences can influence the nature of cognition, emotion, and motivation. Controlling such psychological factors in accordance with one's cultural surroundings is thought to play a large role in the formation of the individual self-system. The importance of the cultural view of the self has been established in several studies [8-12]. Many Asian cultures, including Japanese and Korean ones, have a concept of an interdependent self that emphasizes the fundamental relatedness among individuals. Psychological predispositions associated with

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interdependence include attention to others, an emphasis on engaging emotions and social or interpersonal happiness, a balanced symbolic self, and a tendency to downplay dispositional attributions in favor of situational constraints. In contrast, Western cultures have a concept of an independent self that stresses independence from others [11]. In other words, self-uniqueness, pursuit of personal goals, and maintenance of high self-esteem often require individuals to distinguish themselves from their social surroundings, focus attention on objects that are relevant to their personal goals, and make decontextualized decisions and judgments. Psychological predispositions include self-focused attention, a tendency to experience disengaging rather than engaging emotions, an emphasis on personal rather than social happiness, an inflated symbolic self, and a tendency to draw dispositional attributions [10].

In the culture of the independent self, making decisions according to one's own preferences and values constitutes expression of oneself. Therefore, people who have lived in the Western cultural sphere see their eating behavior as reflecting their own preferences. However, in these times of abundant food when we can select our foods freely, such selection tendencies may bring about the lifestyle-related illnesses of obesity and diabetes, as evidenced by the fact that the prevalence of obesity in Western countries is overwhelmingly higher than in East Asia [13].

Various factors, including the social and physical environment, influence personal eating behaviors [14], and no single theory can fully explain decision-making in such behaviors [15]. For example, although lifestyle-related illnesses are prevalent in Western countries, many individuals in those countries have become interested in the nutritional values and functions of foods [16] and have adopted healthy-minded tendencies [17]. In addition, new ways of helping individuals think about food have been proposed [18]. When discussing improved methods of health promotion, it is necessary to understand the varied cultural influences on eating behavior.

To our knowledge, no studies have examined eating behavior and attitudes with an emphasis on cultural influences. Furthermore, previous research has not investigated the relationship between eating behavior and the cultural view of the self. Numerous reviews and reports document the fact that culture and eating disorders are associated with body image [19-27]. However, only a few sociological reports describe differences in eating behaviors from a cultural viewpoint [28,29].

We conducted a comparative study involving Japanese and Korean university students (who have similar cultural views). Previous reports have found that Japanese students practice more healthful eating habits than do

Koreans, but their self-assessments of the healthfulness of their eating behaviors are lower than those of Korean students [30]. Thus, in this study, we investigated the eating behavior of female university students on the bases of self-assessment. Austrian students (who generally have a Western view of an independent self) were included in the study for comparison with the Japanese and Korean students (who have an Eastern view of an interdependent self).

## 2. Methods

### 2.1. Participants

A total of 766 university students participated in the study (403 Japanese students from four universities, and 178 Korean students and 185 Austrian students from one university in each country). All students were humanities majors; none were studying the natural sciences. Data from male respondents and incomplete data were removed, leaving 276 Japanese, 103 Korean, and 127 Austrian female students in the final data set for the study. The average age of participants was 19.9 (SD = 1.2) years in Japan, 21.5 (SD = 1.8) years in Korea, and 22.3 (SD = 5.2) years in Austria.

### 2.2. Questionnaire

The survey consisted of ten sections assessing eating behaviors. Present appetite (1), interest in eating (2), food preferences and dislikes (3), and the existence of an unbalanced diet (4) were assessed with questions using a five-point scale ranging from 1 ("never") to 5 ("very much"). Frequency of using kitchen knives (5), frequency of using pots and frying pans (6), and intake of different food groups (meat, eggs, vegetables, etc.; 7) were assessed with questions using a four-point scale ranging from 1 ("hardly ever") to 4 ("almost every day"). Meal intake frequency (breakfast, lunch, and dinner; 8) was assessed on a scale from 1 ("never") to 4 ("almost every day") and whether a meal was eaten alone or with family, friends, or others. Methods of food preparation (simmering, frying, roasting, etc.; 9) were assessed with multiple-choice items. The final section, on eating attitudes (10) [30], contained 36 items such as "I try to eat a well-balanced diet" and "I want to eat only my favorite dishes" (all items are shown in **Table 1**), which were assessed on a four-point scale ranging from 1 ("hardly") to 4 ("applies very much"). The survey was originally written in Japanese. Japanese-Korean bilingual and Japanese-German-English multilingual individuals translated the questionnaire into Korean or German and back-translated it to verify accuracy (the survey had previously been translated into English and used in another study). The survey was conducted from December 2005 to December 2006.

**Table 1. Item means for eating attitudes in three cultures (n = 506).**

Item	Japan	Korea	Austria
	(n = 276)	(n = 103)	(n = 127)
1. I try to eat a well-balanced diet.	2.52 <sup>a</sup>	2.35 <sup>a</sup>	3.16 <sup>b</sup>
2. I would very much like to lean to cook.	3.12 <sup>a</sup>	2.74 <sup>b</sup>	2.82 <sup>b</sup>
3. I check for food additives, food coloring, etc. in my food.	2.14 <sup>a</sup>	1.93 <sup>a</sup>	2.46 <sup>b</sup>
4. I eat precooked food, instant and frozen products, and delivery foods (e.g., pizza).	2.38 <sup>a</sup>	2.69 <sup>b</sup>	3.04 <sup>c</sup>
5. I take nutritional supplements like vitamin tables or similar products.	1.72 <sup>a</sup>	2.10 <sup>b</sup>	3.44 <sup>c</sup>
6. The amount of my food intake varies depending on my mood.	2.69 <sup>a</sup>	3.07 <sup>b</sup>	3.22 <sup>b</sup>
7. Practicing healthy eating behaviour is important to me.	2.58	2.68	2.64
8. I would like people to commend my cooking.	3.30 <sup>a</sup>	2.84 <sup>b</sup>	2.97 <sup>b</sup>
9. I buy natural foods and organic vegetables even if they cost more.	1.84 <sup>a</sup>	2.45 <sup>b</sup>	2.54 <sup>b</sup>
10. I try not to eat too much.	2.34 <sup>a</sup>	2.64 <sup>b</sup>	2.55 <sup>ab</sup>
11. Fast food is delicious and convenient.	2.36	2.59	2.31
12. I highly value precooked dishes in the supermarket.	1.73 <sup>a</sup>	1.67 <sup>a</sup>	2.75 <sup>b</sup>
13. I try to eat slowly and chew well.	2.25 <sup>a</sup>	2.76 <sup>b</sup>	2.52 <sup>b</sup>
14. I like to change the dishes (plates, bowls, etc.) I use depending on my mood.	2.04 <sup>a</sup>	2.07 <sup>a</sup>	3.34 <sup>b</sup>
15. I feel uneasy about trusting imported foods.	2.72 <sup>a</sup>	2.66 <sup>a</sup>	1.93 <sup>b</sup>
16. I want to save money on food and spend it on other things instead.	2.50 <sup>a</sup>	2.59 <sup>a</sup>	1.95 <sup>b</sup>
17. I try to eat a variety of foods.	2.25	2.16	2.34
18. I try to eat at the same time every day.	2.20 <sup>ab</sup>	2.52 <sup>a</sup>	2.01 <sup>b</sup>
19. I try to enjoy eating my meals.	2.87 <sup>a</sup>	3.21 <sup>b</sup>	3.34 <sup>b</sup>
20. I think there are many tasty instant noodle soups.	1.91 <sup>a</sup>	2.36 <sup>b</sup>	2.10 <sup>ab</sup>
21. I would like to know more about food nutrients and what functions they have.	2.76 <sup>a</sup>	2.52 <sup>a</sup>	3.03 <sup>b</sup>
22. I don't care what I eat as long as it fills my stomach.	1.67 <sup>a</sup>	1.85 <sup>a</sup>	1.44 <sup>b</sup>
23. I want to buy and try out new food products as soon as they are released.	2.30 <sup>a</sup>	1.95 <sup>b</sup>	2.07 <sup>ab</sup>
24. I want to lose weight just by changing what I eat, without exercising.	2.25	2.46	2.13
25. I always drink vitamin drinks.	1.14 <sup>a</sup>	1.38 <sup>b</sup>	1.41 <sup>b</sup>
26. I don't mind eating the same things every day.	2.16	2.29	2.07
27. I want to eat only my favorite dishes.	2.08 <sup>a</sup>	2.64 <sup>b</sup>	3.39 <sup>c</sup>
28. I dislike cooking and cleaning up afterwards.	2.47 <sup>a</sup>	2.74 <sup>a</sup>	1.83 <sup>b</sup>
29. When food tastes good, I eat more than usual.	3.29 <sup>a</sup>	3.25 <sup>ab</sup>	3.00 <sup>b</sup>
30. I worry about calories when eating.	2.66 <sup>a</sup>	2.42 <sup>ab</sup>	2.21 <sup>b</sup>
31. My eating habits are normal.	2.29 <sup>a</sup>	2.54 <sup>b</sup>	2.83 <sup>b</sup>
32. It's OK to leave food on my plate.	1.79 <sup>a</sup>	2.81 <sup>b</sup>	2.87 <sup>b</sup>
33. I like to eat.	3.51	3.40	3.60
34. I feel like eating when I am in a bad mood.	2.48	2.77	2.53
35. When I see a person eating, I want to eat as well.	2.79 <sup>a</sup>	2.91 <sup>a</sup>	2.22 <sup>b</sup>
36. I like to strengthen relationships with other people by eating together.	2.43 <sup>a</sup>	2.73 <sup>b</sup>	2.90 <sup>b</sup>

The items were rated on a four-point scale and one-factor ANOVAs were conducted. Multiple comparisons of items for which significant differences ( $P < 0.01$ ) were found were conducted via Scheffe's test. Mean values in the same row with different superscripts differ significantly with each other.

Questionnaires were distributed to students during lecture time at each investigative university, and the survey objective was explained to the participants by the survey administrator. Questionnaires were collected at the end of the lecture time. Though an ethics committee did not exist at the Japanese study site during the study period, the survey was conducted in accordance with the ethical standards outlined in the Declaration of Helsinki. Very similar survey content obtained approval from the Human Research Ethics Committee and the Human Genome Research Ethics Committee of the University of Nagasaki after 2007 as for a related study by the same lead author [31].

### 2.3. Data Analysis

Data analyses were performed using the STATISTICA 06J software package (StatSoft Japan Co., Tokyo, Japan). Cross-tabulations (sections 5 through 9) and one-factor ANOVAs (sections 1 through 4 and section 10) were performed to compare the responses of the students by cultures. The responses to section 9 were aggregated into two groups of “more than three or four times per week” and “less than one or two times per week.” Chi-square tests were used to assess the statistical significance of the cross-tabulation comparisons. Multiple comparisons of significant differences revealed by ANOVAs were conducted via Scheffe’s test. A  $P$  value of less than 0.01 was set to determine statistical significance. Results relevant to eating behaviors of female students among the three cultures are reported here; other findings are reported elsewhere [30,32].

## 3. Results

### 3.1. Eating Behaviors among the Three Cultures

The rates of participants who ate breakfast, lunch, and dinner almost every day and the rates of those who ate each meal alone are shown in **Table 2**. The rate of Austrian students who ate breakfast tended to be higher than that of Japanese or Korean students ( $P = 0.016$ ), even though more than 40% of Austrian students skipped breakfast. About 80% of Japanese students ate lunch and dinner regularly, and these rates were considerably higher than rates for Korean and Austrian students ( $P < 0.001$ ). The rates of Korean students who ate lunch and dinner every day were low (about 50% for each meal).

Japanese students ate breakfast or dinner alone more often than did Korean or Austrian students ( $P < 0.001$ ), but the rate of Austrian students eating lunch alone was higher than that of Japanese and Korean students ( $P < 0.001$ ).

Comparisons of food groups consumed more than three to four times per week are shown in **Table 3**. Cross-cultural differences were observed in the consumption frequencies of all food groups except for potatoes and soft drinks. The intake frequencies of sweets and animal food products, such as eggs, meats, and seafood, were higher among Japanese students than among Korean and Austrian students. Intake frequencies of soybeans, seaweed, and mushrooms were higher in Japanese and Korean students than in Austrian students. Austrian students consumed dairy products more frequently but had a very low intake of eggs and seafood compared with Japanese and Korean students. The frequency of alcohol consumption was higher among Korean than among Japanese and Austrian students.

Cross-cultural differences were observed in all methods of food preparation except for preparation of uncooked fish (**Table 4**). Japanese students mainly used pan-frying, roasting, and simmering, while Korean students mostly used pan-frying. Austrian students mostly used simmering and pan-frying methods, but they also used steaming method, and “parboiling and pressing methods” more than Japanese or Korean students did. Korean students ate raw salads less frequently than did Japanese and Austrian students.

We also collected data on whether students cooked for themselves by surveying the frequency with which they used kitchen utensils. The percentages of students who used specific utensils (knives and pans) almost every day were 30.8% and 30.4% for Japanese students, 10.7% and 19.4% for Korean students, and 71.7% and 55.1% for Austrian students, respectively ( $P < 0.001$ ).

### 3.2. Eating Attitudes

The 36 items surveying eating attitudes were evaluated and the means compared among the three cultures. The results of these analyses are shown in **Table 1**.

Cross-cultural differences were found for 29 items. On three items (4, 5, and 27), all three cultures differed from each other, with Austrian students having the highest scores on all three items. On five additional items (1, 3, 12, 14, and 21), Austrian students scored the highest, but there were no significant differences between the Japanese and Korean students. The highest means for Japanese students were found on items 2 and 8. On nine items (4, 5, 6, 9, 13, 27, 31, 32, and 36), Japanese students had the lowest means, and these means were significantly different compared to means for Korean and Austrian students (whose means did not differ from each other except for items 4, 5, and 27). Significant differences were noted among both samples of East Asian (Japanese and Korean) students compared to Austrian students on ten items (1, 3, 12, 14, 15, 16, 21, 22, 28, and 35), while Japanese students differed from the other two cultures on ten items (2, 6, 8, 9, 13, 19, 25, 31, 32, and 36). Con-

**Table 2. Percentage (%) of students eating each meal almost every day and alone (n = 506).**

	Breakfast		Lunch		Dinner	
	Every day	Alone	Every day	Alone	Every day	Alone
Japan (n = 276)	50.36	76.81	85.51	13.77	83.33	44.57
Korea (n = 103)	45.63	45.63	48.54	13.59	54.37	13.59
Austria (n = 127)	58.27	59.84	70.87	33.86	52.76	34.65
Chi-square (df = 2)	15.7	52.9	58.9	150.4	87.0	54.4
P value	0.016	<0.001	<0.001	<0.001	<0.001	<0.001

Frequency of eating each meal was rated on a four-point scale: (1) never, (2) occasionally, (3) sometimes, and (4) almost every day. Four options were available to indicate with whom the meal was eaten: (1) alone, (2) family, (3) friend(s), and (4) other(s). Chi-square tests were conducted between the percentages among three cultures.

**Table 3. Percentage (%) of students who ate each food group more than three to four times per week (n = 506).**

Food group	Japan	Korea	Austria	Chi-square	P value
	(n = 276)	(n = 103)	(n = 127)	(df = 2)	
Eggs	67.75	45.63	5.51	135.3	<0.001
Meats	73.91	36.89	25.20	98.7	<0.001
Seafood	39.86	15.53	5.51	60.7	<0.001
Milk and dairy products	68.48	67.96	84.25	12.1	0.002
Soybeans	50.72	51.46	6.30	79.1	<0.001
Vegetables	90.58	83.50	75.59	16.0	<0.001
Fruits	33.33	68.93	73.23	45.8	<0.001
Seaweed	27.17	39.81	0.00	57.2	<0.001
Mushrooms	29.99	21.36	2.36	37.5	<0.001
Potatoes	33.30	25.24	30.71	2.3	0.316
Alcoholic beverages	3.62	21.36	11.02	29.3	<0.001
Soft drinks	30.07	26.21	26.77	0.8	0.675
Sweets	76.09	49.51	57.48	29.1	<0.001

The items were rated on a four-point scale: (1) hardly, (2) 2 - 3 times per week, (3) 3 - 4 times per week, and (4) almost every day. The results are shown as the percentage who responded "(3)" and "(4)". Chi-square tests were conducted between the percentages in the three cultures. Data regarding fruit intake were available only from 114 Japanese participants.

**Table 4. Percentage (%) of food preparation methods used by students (n = 506).**

Cooking method	Japan	Korea	Austria	Chi-square	P value
	(n = 276)	(n = 103)	(n = 127)	(df = 2)	
Simmering	52.17	22.33	90.55	110.4	<0.001
Roasting	55.80	37.86	20.47	45.8	<0.001
Frying	31.52	23.30	9.45	23.1	<0.001
Pan-frying	83.70	58.25	66.14	30.9	<0.001
Dressing (with sauce)	22.46	31.07	8.66	18.5	<0.001
Parboiling and pressing	13.04	15.53	34.65	27.4	<0.001
Steaming	4.35	9.71	42.52	102.2	<0.001
Uncooked fish (Sashimi)	8.70	2.91	2.36	8.4	0.015
Raw salad	61.59	24.27	79.53	73.9	<0.001

Chi-square tests were conducted for comparisons among the three cultures.

versely, only four items did not show significant differences between Japanese and Austrian students (10, 18, 20, and 23).

#### 4. Discussion

To the best of our knowledge, no previous research has performed detailed cross-cultural comparisons regarding eating behaviors such as eating habits and attitudes. Eating habits, including meal times, consumption of various food groups, cooking frequency, and cooking methods, differed greatly among the three cultures. Several comparable tendencies regarding eating attitudes and similar correlations between eating habits and eating attitudes were observed in Japanese and Korean students. Conversely, opposing tendencies were observed in Austrian students. Assessment of their own eating attitudes as healthy was lower among Japanese students than among Austrian students, even though a higher variety of food intake and more regular consumption of three meals each day were observed in the Japanese students. The rates of Korean and Austrian students who ate lunch or dinner almost every day were lower than the rate for Japanese students. These results are particularly interesting since the problem of irregular meal intake was one of the reasons for establishing the “Food Education Basic Law” in Japan [1].

Eating breakfast or dinner with friends occurred more often for Korean and Austrian students than for Japanese students, and this habit might be related to the attitude that eating meals together fosters relationships. Mean scores for questions such as “I like to strengthen relationships with other people by eating together” were higher for Korean and Austrian students than for Japanese students (**Table 1**). A decreased tendency of spending time on relationships has recently been recognized in Japan [33]. In Korea and Austria, meals might serve not only to satisfy appetites but also to enhance social relationships. Among Korean students, a higher rate of eating with friends were found for students living both with their families and in student housing.

Although the rate of students who always ate dinner was relatively high among Japanese students (**Table 2**), the rate of those who ate dinner with a friend was relatively low (data not shown). Female Japanese students usually spend time each day attending to their friends and maintaining their relationships. Although this does not feel disagreeable when friends do the same for them, the tendency to act for others is increasing in Japan [34]. Therefore, Japanese students might prefer to eat dinner alone in a more carefree atmosphere.

In comparison with Korean and Austrian students, the Japanese students consumed a wider variety of food

groups. Notably, the frequency of consuming animal products was higher. Only milk and dairy products, vegetables, fruits, and sweets were eaten more than three to four times per week by more than 50% of Austrian students. Though it makes sense that consumption of seaweed, soybeans, and mushrooms were low among Austrian students because these foods are not common in Austrian cooking, Austrians also reported low levels of meat consumption. Studies of meal patterns of Austrian women reveal that 30% consume a mixed diet containing a large amount of fruits and vegetables, and 50% consume a mixed diet containing less meat than average and a normal volume of other foods [35]. Therefore, our findings of limited intake of animal products among our Austrian sample are reasonable. While many assume that Koreans prefer dishes made using meats and meat products, meat consumption more than three to four times per week was reported by Korean students only about half as frequently as by the Japanese students in our sample.

Of the 36 questionnaire items related to eating attitudes, significant cultural differences were found on 29 items (**Table 1**). The means of eight items (1, 3, 4, 5, 12, 14, 21, and 27) were higher for Austrian students than for Japanese and Korean students. These items included statements related to healthy eating (1, 3, and 21) and dining attitudes and personal policies about convenience foods (4, 5, 12, 14, and 27). This may show that Austrians have an independent view of self that carries through into their eating behaviors [11]. Further, Austrian students may assume that their eating behaviors, selected according to their own judgment, are correct, that their eating habits are normal, and that they eat a well-balanced diet. However, eating only favorite dishes may lead to an unbalanced diet, and the calorie content of delivery food and precooked dishes from the supermarket is generally high. Because of their independent views and emphasis on self-esteem, it may be that Western people fail to recognize inconsistencies in their self-assessment.

The means of 11 items were lower for Japanese students than for Korean and Austrian students. When Japanese students were compared to Austrian students (or to the combination of Austrian and Korean students), differences greater than one point were observed on items 5, 27, and 32: Japanese students took fewer nutritional supplements, did not solely eat their favorite foods, and tended not to leave food uneaten. The reasons for these habits might be that the food volume of a Japanese meal is typically small, and Japanese individuals might pay more attention to “mottainai” (treating things with due respect). Thus, Japanese individuals rarely leave food uneaten. In addition, Japanese individuals are thought to believe that necessary nutrition comes from the foods themselves, and that eating only one’s favorite foods

does not provide sufficient nutrition. Furthermore, self-criticism among Japanese individuals is common, and they tend to downplay their skills and habits [36,37]. For this reason, Japanese individuals might self-rate their eating attitudes less favorably than Austrian individuals.

Limitations of this study include the use of only one study site in both Korea and Austria, as opposed to four in Japan, and differences in average age and major field of study among the comparison cultures. However, although various types of university (national and private, urban and rural) and plural major fields were included in the Japanese portion of the study, the differences among universities were very small as compared with the differences among cultures.

Physical measurements of the participants, such as height, weight, and quantitative food or nutrient intake, were not collected in the present study. Previously, no significant differences in intake of fish, meat, or eggs have been observed for Japanese and Korean people between the ages of 20 and 29 years [38]. However, there is a possibility that participants did not accurately estimate what and how much they consumed [39]. In addition, the rate of overweight individuals in Western populations is overwhelmingly higher than in Southeast Asian populations [13]. Westerners might make inaccurate judgments about their eating behavior, as evidenced by the finding that 71% of subjects from the EU agree with the statement, "I do not need to make changes to the food I eat, as it is already healthy enough" [40]. Agreement with this statement is thought to stem from the Western cultural view of self-promotion and the maintenance of high self-esteem. In addition, there are some reports and discussions that perceived self-efficacy is strongly related to healthy eating behaviors [7,40,41]. It is possible that unhealthy dietary habits are influenced by cultural self-views, whereby individuals misinterpret appropriate eating behavior on the basis of their social surroundings.

In conclusion, behaviors that reflect Western cultural views of independence might influence various problematic eating habits. Such habits can lead to obesity and lifestyle-related illness. Conversely, in Asian countries (especially in Japan), self-criticism originating from interdependent self-views might be reflected in negative self-assessments of relatively healthy eating behaviors. In order to reduce the prevalence of obesity and other lifestyle-related diseases, individuals should be provided with tools and guidance to accurately assess their own eating behaviors and to heighten objective judgment capability. Future studies should collect physical measurements of the subjects as well as quantitative data on nutrient intake, so that self-assessments can be compared to objective measures.

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