

Development of the scale for attitude toward new foods

Leyla Ozgen¹, Mehlika Benli², Fatih Turkmen³

¹Gazi University, Faculty of Health Sciences, Department of Social Services, Ankara, Turkey - E-mail: lozgen@gazi.edu.tr; ²Ankara University, Faculty of Science, Department of Biology, Besevler, Ankara, Turkey. ³Akhmet Yassawi International Kazakh, Turkish University, Faculty of Social Sciences, Department of Tourism Management, Turkistan/Kazakhstan, Karabuk University, Safranbolu Faculty of Tourism, Department of Tourism Management, Karabuk, Turkey

Summary. *Aim:* This study aimed to develop an instrument to assess consumer attitude toward new foods. *Methods:* This was a descriptive study. The five-point Likert-type scale comprised three subscales and 25 items. In the study, the “Demographic Information Form,” the “Scale for Attitude toward New Foods” (SATNF) and the “Innovativeness Scale” (IS) were used as data collection instruments. *Study group:* The study sample comprised 300 respondents selected with convenience sampling. The results of the factor analysis performed to test construct validity yielded item factor loadings varying between 0.32 and 0.70 while Cronbach’s alpha values for the *skepticism*, *innovativeness* and *traditionalism* subscales were computed as 0.74, 0.80 and 0.72, respectively. The applicability of factor analysis to the data structure was tested with a Kaiser-Meyer-Olkin test (0.76) and a Bartlett’s test of sphericity ($X^2 = 1855.123$; $p < 0.000$). *Results and Discussion:* The findings indicated that the scale was a valid and reliable construct. The study results revealed significant differences in the *skepticism* subscale by gender, marital status and attention to brand, food label and nutrition content. *Innovativeness* scores of the respondents who were attentive to nutrition content when tasting new foods were found to be higher than those who were not attentive. In addition, married respondents had a higher mean score in the *traditionalism* subscale compared to unmarried respondents. Conducting further validity and reliability studies for the Scale for Attitude toward New Foods at different times would help the scale become a more valid and reliable instrument. The researchers *recommend* investigating attitude toward new foods among individuals living at coastal and inland areas and examining the differences between the subscales in future studies on the subject. This study has some limitations. The greater number of female respondents in comparison to male respondents and the fact that most of the respondents did not complete and return the questionnaire forms while some respondents even submitted incomplete forms are among these limitations.

Key words: Neophobia, new foods, scale, attitude, skepticism, innovativeness, traditionalism

Introduction

When encountering new foods, people can be enthusiastic to try some foods while being reluctant to taste others. This suspicion and fear of tasting new and unfamiliar foods is referred to as food neophobia (1-3). In the study by (4), food neophobia is characterized as refraining from tasting new foods, mistrust of contents of foods, suspicion of foods with unknown contents, and avoiding ethnic restaurants as well as not eating during travels abroad due to the unfamiliar taste of

foods from different countries or cultures. In addition, the studies by (5-7) reported that various factors (e.g. high number of visits to different countries and cities, age, gender and media and visual communication tools) acted positively on the attitude toward tasting new foods. (8, 3) found that better visuality in food packaging, use of colored glass jars or non-harmful packaging materials, food brand, food label and nutrition content also positively influenced attitude toward tasting new foods. Furthermore, individuals with food allergies were reported to have a greater tendency for

food neophobia (9). Another study reported that foods and beverages available in the destination were particularly perceived as a part of the touristic experience and emphasized the importance of tasting and experiencing new foods (10). Tasting new foods is a travel motivation for some tourists who travel with the purpose of trying new foods and beverages (10, 11). The researchers found no existing instrument for assessing attitude toward new foods in Turkey. The significance of this study is based on the ease of access to previously untasted products due to the ease of commerce between cities and countries with the introduction of the fusion cuisine to gastronomic tourism. This study, which aimed to design and develop a scale for investigating attitude toward new foods, also contributes to other studies in the literature.

Materials and Methods

This study adopted a descriptive survey design based on respondent opinions. The subscales were analyzed with respect to gender, marital status, education and attention to brand, label and nutrition content when buying new food.

Study Group

The population of this study is 922,536 consumers residing in the Cankaya district of Ankara. In this study group, the model $n = NPq / (N-1) B^2 + Pq / Z^2$ developed by (12) with convenience sampling method is applied. According to the form; $q = 1-P$, $B =$ Foldable error rate, $Z =$ The desired confidence interval, where n is the number of samples, N is the population subject to the study, P is the community ratio or estimate. According to this; $N = 1820$ students, $P = 0. (0.5) / (1820-1) (0.05)^2 + (0.5) (0.5) / (1.96)^2$ If the calculation result is $n = 364$ students. For the students, 300 questionnaires were taken after being handed out from 500 duplicated and applied questionnaires. The study sample comprised 300 respondents (166 female and 134 male) selected with convenience sampling, a non-probability sampling method. 55.3% of the consumers were female and 44.7% were male. The percentages of the respondents aged 18-22, 23-27, 28-32, 33-37, 38-42, 43-47 and 48 and over were 35.3%, 20%, 8.7%,

9.3%, 11.3%, 3.7% and 11.7%, respectively. 67.0% of the respondents were single and 33.0% were married, while the percentages of those who had middle school, high school, undergraduate, master's and doctoral degrees were 8.7%, 41.7%, 33.3%, 9% and 5.3%, respectively. 86.7% of the respondents were attentive to food brand while 13.3% were not.

Development of the Scale

In the study, the "Demographic Information Form," the "Scale for Attitude toward New Foods" (SATNF) and the "Innovativeness Scale" (IS) were used as data collection instruments.

Demographic Information Form

This form involves questions on gender, marital status, education and attention to brand, label and nutrition content when buying new food items.

Development of the Scale for Attitude toward New Foods

For the validity-reliability study of the Scale for Attitude toward New Foods, previously developed scales for assessing attitude toward new foods (7, 9, 13,14,) compiled after a survey of literature were reviewed and a pool of 36 items was generated. The draft form was submitted to a group of three specialists consisting of a field specialist, an assessment and evaluation specialist and an English language specialist to be reviewed for content validity as well as for language and expression. After amendment in accordance with specialist suggestions, the scale was submitted to three specialists in the field for peer debriefing to be evaluated for characteristics such as comprehensibility and ease of answering. In line with their recommendations, the subscales of the assessment instrument were designated as *skepticism*, *innovativeness* and *traditionalism*. In the second stage, a statistician was consulted for content validity.

At the beginning, the scale was designed as a 36-item construct with 12 items each in the *skepticism*, *innovativeness* and *traditionalism* subscales. After pilot administration on various respondents, unclear items were amended, and the scale was finalized for administration. Each item was rated as a five-point Likert-type system (i.e. 1=Strongly disagree, 2=Slightly agree, 3=Moderately agree, 4=Agree, 5=Strongly agree). Negative items were reverse scored. Cronbach's alpha internal consistency co-

efficient and item total correlations were computed for scale reliability. In the evaluation of item total correlations, items below 0.30 and items with negative values were removed from the scale. Cronbach's alpha values for the *skepticism*, *innovativeness* and *traditionalism* subscales of the Scale for Attitude toward New Foods were computed as 0.74, 0.80 and 0.72, respectively. The applicability of factor analysis to the data structure was tested with a Kaiser-Meyer-Olkin test (0.76) and a Bartlett's test of sphericity ($X^2 = 1855.123; p < 0.000$). A KMO value greater than 0.70 and a significant Bartlett's test of sphericity result demonstrated the applicability of factor analysis in the study (15, 16).

Data Collection

Data were gathered by the researchers through face-to-face questionnaires. The scale took approximately 10 minutes for the respondents to complete. Participation was conducted on a voluntary basis. The scale was administered to the customers of various restaurants in Cankaya, Ankara with permission from the proprietors.

Statistical Analyses

Data gathered with the Scale for Attitude toward New Foods in accordance with the study objective were analyzed with the SPSS-21 software package and the validity and reliability analyses for the scale were conducted. A t-test and a one-way ANOVA were performed to identify the differences in the subscales of the Scale for Attitude toward New Foods with respect to the demographic variables.

Results

An exploratory factor analysis (EFA) was used to test the construct validity of the Scale for Attitude toward New Foods and a principal component analysis (PCA), followed by a varimax rotation, was performed to identify independent subscales. Items with a factor loading and an eigen value of 0.32 and 1.00, respectively, were included in the scale. Exploratory factor analysis supported the three-factor structure and the scale initially designed as a 36-item construct comprised three subscales and 25 items after pilot administration.

Table 1 shows that factor loadings for the *skepticism*, *innovativeness* and *traditionalism* subscales of the Scale for Attitude toward New Foods varied between 0.496-0.702, 0.447-0.663 and 0.328-0.437, respectively. These three factors explained 75.172% of the total variance while the variances explained after rotation by *skepticism*, *innovativeness* and *traditionalism* were 32.34%, 22.72% and 20.11%, respectively. Internal consistency of the subscales was tested with the Cronbach's alpha which was computed as 0.74, 0.80 and 0.72 for *skepticism*, *innovativeness* and *traditionalism*, respectively, while the Cronbach's alpha for the overall scale was found to be 0.746. The assessment criteria for the Cronbach's alpha indicate that the scale has an acceptable reliability coefficient (17).

Examination of the t-test results for the *skepticism* subscale of the Scale for Attitude toward New Foods with respect to gender given in Table 2 revealed a higher arithmetic mean score for men ($\bar{X}=2.23$) in comparison to women ($\bar{X}=2.31$). In the *skepticism* subscale of the Scale for Attitude toward New Foods with respect to marital status, married respondents ($\bar{X}=2.32$) had a higher arithmetic mean score than unmarried respondents ($\bar{X}=2.06$). The results indicated statistically significant differences in the *skepticism* subscale by gender and marital status ($p < 0.05$). The respondents who reported paying attention to brand when buying food ($\bar{X}=2.18$) scored higher in the *skepticism* subscale of the Scale for Attitude toward New Foods than those who did not ($\bar{X}=1.91$). The respondents who reported paying attention to food label when buying food had a higher arithmetic mean score ($\bar{X}=2.19$) in the *skepticism* subscale of the Scale for Attitude toward New Foods while those who did not a lower arithmetic mean score ($\bar{X}=1.87$). The respondents who replied "Yes" ($\bar{X}=2.27$) to the statement "I pay attention to nutrition content," were found to have a higher arithmetic mean score than those who replied "No," ($\bar{X}=1.94$). There was a statistically significant difference in the *skepticism* subscale of the Scale for Attitude toward New Foods with respect to attention to brand and food label when buying food ($p < 0.05$). According to the t-tests result for the *innovativeness* subscale of the Scale for Attitude toward New Foods, the respondents who reported paying attention to nutrition content ($\bar{X}=2.33$) had a higher arithmetic mean score than those who did not ($\bar{X}=2.21$). The results yielded a statistically significant difference in the

Table 1. Validity and Reliability Values for the Scale for Attitude toward New Foods

Component number Statements	Factor loading	Eigen values	of variance (%)	Cumulative	Cronbach's Alpha
<i>Skepticism subscale</i>		4.043	32.342	32.342	0.744
1- I do not taste new foods at unhygienic places.	0.496				
2- I taste foods at places with an open kitchen.	0.518				
3- I do not eat foods whose appearance I do not find appealing.	0.527				
4- I do not taste foods whose ingredients I do not know.	0.536				
5- I do not taste foods from street vendors.	0.550				
6- I do not taste meat without halal certification.	0.557				
7- I learn whether the chefs who prepare the food follow the innovations in the world cuisine.	0.568				
8- I would taste a food if it was prepared in accordance with religious principles.	0.613				
9- I know whether the chefs who prepare the food have biannual medical examinations.	0.702				
<i>Innovativeness subscale</i>		2.839	22.716	55.058	0.801
10- I would want a new food to be a product I have never tasted before.	0.447				
11- If I encounter a food I have not tasted, I try it.	0.494				
12- I taste foods with contrasting flavors.	0.495				
13- The ambiance of the environment influences whether I taste a new food.	0.578				
14- I taste foods with different appearances.	0.584				
15- I taste foods from different regions.	0.635				
16- I try foods with unfamiliar tastes.	0.647				
17- I try tropical foods.	0.652				
18- I taste local food when I am in a foreign country.	0.663				
<i>Traditionalism subscale</i>		2.514	20.114	75.172	0.716
19- I would taste ice cream made with kefir instead of milk.	0.328				
20- I always season my food with the same spices.	0.333				
21- I would not want to use different flavors in foods.	0.336				
22- I never taste food from abroad.	0.346				
23- I would not cook my food with a recipe I have not used before.	0.360				
24- I would go to a Turkish restaurant to eat when I am in a foreign country.	0.400				
25- I eat food I am familiar with.	0.437				
Overall reliability (Cronbach's Alpha)	0.746				
<i>Kaiser-Meyer-Olkin (KMO)=0.762 Bartlett's test: ($\chi^2=1855.123$; $p<0.000$)</i>					

innovativeness subscale of the Scale for Attitude toward New Foods with respect to attention to nutrition content ($p<0.05$). However, albeit the higher arithmetic means scores for gender, marital status, attention to food label and attention to nutrition content, the differences were found to be statistically insignificant ($p>0.05$).

Examination of the t-test results for the *traditional-*

ism subscale of the Scale for Attitude toward New Foods with respect to marital status revealed a higher arithmetic mean score for married respondents ($\bar{X}=2.02$) in comparison to unmarried respondents ($\bar{X}=1.83$) and there was a statistically significant difference in the *traditionalism* subscale by marital status ($p<0.05$). However, although arithmetic mean scores for gender, attention to brand, food

Table 2. Differences in subscales by demographic variables (t-test) n=300

Subscale	Variable	Group	n	\bar{X}	Standard deviation	t	p
Skepticism	Gender	Female	166	2.23	0.391	4.074	0.000*
		Male	134	2.31	0.417		
	Marital status	Married	99	2.32	0.41	5.304	0.000*
		Single	201	2.06	0.38		
	Attention to food brand	Yes	260	2.18	0.39	4.027	0.000*
		No	40	1.91	0.44		
	Attention to food label	Yes	257	2.19	0.40	4.874	0.000*
		No	43	1.87	0.37		
	Attention to nutrition content	Yes	186	2.27	0.39	7.317	0.000*
		No	114	1.94	0.36		
Innovativeness	Gender	Female	166	2.31	0.43	1.112	0.267
		Male	134	2.25	0.48		
	Marital status	Married	99	2.22	0.50	-1.597	0.111
		Single	201	2.31	0.42		
	Attention to food brand	Yes	260	2.29	0.44	0.288	0.773
		No	40	2.26	0.51		
	Attention to food label	Yes	57	2.30	0.46	1.638	0.103
		No	43	2.18	0.41		
	Attention to nutrition content	Yes	186	2.33	0.47	2.163	0.031*
		No	114	2.21	0.42		
Traditionalism	Gender	Female	166	1.88	0.42	-0.537	0.592
		Male	134	1.91	0.45		
	Marital status	Married	99	2.02	0.48	3.491	0.001*
		Single	201	1.83	0.40		
	Attention to food brand	Yes	260	1.89	0.42	-0.522	0.602
		No	40	1.93	0.48		
	Attention to food label	Yes	257	1.89	0.43	0.079	0.937
		No	43	1.89	0.46		
	Attention to nutrition content	Yes	186	1.88	0.45	-0.854	0.394
		No	114	1.92	0.41		

*p<0.05, p>0.05

label and nutrition content were found to be high in the *traditionalism* subscale, the differences were statistically insignificant ($p>0.05$).

According to the one-way analysis of variance results given in Table 3, there was a statistically significant difference in the *skepticism* subscale of the Scale for Attitude toward New Foods by age [$F= 3.983$], ($p<0.05$). A Tukey HSD Post-Hoc test was performed

to determine the difference between groups. The arithmetic mean scores of 33-37 ($\bar{X}=2.33$) and 43 and older ($\bar{X}=2.28$) age groups were higher while those of 18-22 ($\bar{X}=2.06$) and 23-27 ($\bar{X}=2.05$) age groups were lower.

The results revealed a statistically significant difference in the *innovativeness* subscale of the Scale for Attitude toward New Foods by age [$F= 2.257$], ($p<0.05$). The arithmetic mean score of 23-27 age

Table 3. Differences in subscales by demographic variables (ANOVA) n=300

Subscale	Variable	Group	\bar{X}	Standard deviation	F	p	Tukey
Skepticism	Age	1	2.06	0.36	3.983	0.002*	1-4.6 2-4.6
		2	2.05	0.39			
		3	2.16	0.47			
		4	2.33	0.44			
		5	2.21	0.43			
		6	2.28	0.39			
Innovativeness	Age	1	2.30	0.40	2.257	0.049*	2-6
		2	2.41	0.40			
		3	2.28	0.48			
		4	2.25	0.51			
		5	2.28	0.51			
		6	2.12	0.50			
Traditionalism	Age	1	1.82	0.38	3.433	0.005*	1-4 2-4
		2	1.80	0.39			
		3	1.90	0.45			
		4	2.09	0.49			
		5	1.92	0.41			
		6	2.04	0.50			

* $p < 0.05$, $p > 0.05$ (1= 18-22, 2= 23-27, 3= 28-32, 4= 33-37, 5= 38-42, 6= 43 and older)

group ($\bar{X}=2.41$) was found to be higher while that of 43 and older age group ($\bar{X}=2.12$) was lower.

There also was a statistically significant difference in the *traditionalism* subscale of the Scale for Attitude toward New Foods by age [$F= 23.433$], ($p < 0.05$). The arithmetic mean score of 33-37 ($\bar{X}=2.09$) age group was higher while the arithmetic mean score of 18-22 ($\bar{X}=1.82$) and 23-27 ($\bar{X}=1.80$) age groups were lower.

Discussion

This study was aimed at developing an instrument to assess consumer attitude toward new foods. In the study, the five-point Likert-type scale comprised three subscales (i.e. *skepticism*, *innovativeness* and *traditionalism*) and 25 items according to exploratory factor analysis and Cronbach's Alpha coefficient results. A principal component analysis and a varimax rotation were performed to determine independent subscales. Items with a factor loading and an eigen value of 0.32 and 1.00, respectively, were included in the scale. Ex-

ploratory factor analysis supported the three-factor structure. The scale is a valid and reliable instrument for investigating consumer attitude toward new foods. The researchers believe that the scale will fulfill the need in the literature for a reliable assessment instrument for future studies.

According to gender, male respondents had a higher mean score than female respondents in the *skepticism* subscale of the Scale for Attitude toward New Foods. The skeptical attitude of men due to their aloofness from food preparation in comparison to women and their unwillingness to taste new foods are supported by past studies. Some studies indicated greater skepticism toward new foods among men than women while others argued that gender did not act on attitude toward new food and yet another study reported low levels of neophobia for both men and women (13,14,18). Past studies indicate that women's greater responsibility in food preparation contributes to more familiarity with foods and a positive attitude toward new foods (19). Another study determined that women bought more non-necessary food items during

food shopping than men in order to taste new foods due to curiosity and interest (20).

Another finding was greater attention to brand, food label and nutrition content among skeptical consumers. Skepticism toward an unknown food or a new food that the consumer has heard the name of, is familiar with or has seen the image of is supported with similar studies. (21) reported some degree of skepticism toward food brand, information visually presented on food label and nutrition content information on food packaging, when buying new products. Another study conducted by (22) reported that consumers expressed paying attention to brand when buying food but still felt skeptical toward tasting the new food.

The study results showed that the number of respondents who replied "Yes" to the statement "I pay attention to nutrition content when I taste new food," was higher than the number of respondents who replied "No." Past studies support the notion that attention to nutrition content stems from an interest and innovative attitude toward new foods. (22, 23) reported that consumers were willing to purchase and taste a vegetal and organic food produced with nanotechnology. Similar studies indicate nutrient information on food label as an effective tool that facilitates making nutritional choices and that is conducive to a healthy diet and freedom of nutritional choice (24, 25).

The results also revealed that married respondents were more traditional, which can be attributed to various cultural, social, personal and psychological factors. The study by (26) found that married individuals generally preferred foods they were accustomed to and placed emphasis on flavor. Moreover, another studies argued that having a traditional attitude toward new foods was a result of family dietary habits and environmental conditions or genetic predispositions (27, 28).

Older consumers were found to have a more *traditional* and *skeptical* attitude toward new foods while younger consumers were more *innovative*. Young consumers enjoy tasting tropical and aromatic products and are more open to trying new foods. (26) reported that young participants (18-34 years old) which comprised 62% of the study sample were more inclined to buying and trying previously untasted foods. (29) Determined that innovative consumers were mostly young and had a positive attitude toward product advertisement and new

products. In addition, (30) reported greater traditionalism and skepticism toward trying new foods among the older age group (66-80 years old).

Conclusion

This study was planned with the aim of developing a scale for investigating attitude toward new foods. The scale comprised three subscales (i.e. *skepticism*, *innovativeness* and *traditionalism*) and 25 items. The scale is a valid and reliable assessment instrument for determining consumer attitude toward new foods. The study results indicated greater *skepticism* among women in comparison to men. The respondents were found to be mostly *skeptical* with respect to attention to brand, food label and nutrition content. Another study result was higher *traditionalism* among married respondents than unmarried respondents. Furthermore, older respondents were found to be more *traditional* and *skeptical* toward new foods while younger respondents were more *innovative*. Conducting further validity and reliability studies for the Scale for Attitude toward New Foods at different times would help the scale become a more valid and reliable instrument. The researchers recommend investigating attitude toward new foods among individuals living at coastal and inland areas and examining the differences between the subscales in future studies on the subject. This study has some limitations. The greater number of female respondents in comparison to male respondents and the fact that most of the respondents did not complete and return the questionnaire forms while some respondents even submitted incomplete forms are among these limitations.

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- Correspondence:
Leyla Ozgen
Gazi University, Muammer Yasar Bostancı Cad.
Incitas Sok. No: 15, 06500 Ankara/ Turkey
Phone: +90 312 212 35 06
Fax: +90 312 36 40
E-mail: lozgen@gazi.edu.tr