Food Quality and Preference 28 (2013) 222–225

Contents lists available at SciVerse ScienceDirect

Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Short Communication

Testing a Spanish-version of the Food Neophobia Scale

V. Fernández-Ruiz [a], A. Claret [b], C. Chaya [c,*]

[a] Departamento de Nutrición y Bromatología II, Facultad de Farmacia, Universidad Complutense de Madrid, Avenida Complutense s/n, 28040 Madrid, Spain
[b] IRTA Food Technology, XaRTA, Finca Camps i Armet, E-17121 Monells, Spain
[c] Department of Statistics and Management Science in Agriculture, ETSI Agrónomos, Technical University of Madrid, Avenida Complutense s/n, 28040 Madrid, Spain

ARTICLE INFO

Article history:
Received 26 July 2012
Received in revised form 21 September 2012
Accepted 25 September 2012
Available online 4 October 2012

Keywords:
Food Neophobia Scale
Spanish version
Spanish consumers

ABSTRACT

Food neophobia has been the subject of many studies over the last two decades in several countries, as it affects both the quality and variety of foods in the diet. Pliner and Hobden (1992) developed and tested a 10-item verbal instrument, the Food Neophobia Scale (FNS) to quantify this individual trait. FNS has been widely applied to predict willingness to try new foods. There has been concern about the meaning and interpretation of individual FNS statements in different populations and cultures. Although it is tempting to compare FNS scores across these studies, appropriate psychometric analyses are required to test the scale and allow cross-cultural comparisons. In Spain, there are few studies based on testing the FNS in the Spanish language, as well as its application among the Spanish people. Therefore, the aim of this study is to propose and test a Spanish version of the FNS using different psychometric measures and to study food neophobia among Spanish consumers ($N = 309$).

The results showed that the Spanish food neophobia mean value was 31.74 (S.D. 10.98). Gender effect was close to significance ($p < 0.062$) and age effect was significant ($p < 0.003$). Reliability of FNS was assessed, FNS Cronbach's alpha was 0.82 and item-total correlations for items 9, 3 and 2 ranged from 0.52 to 0.57, showing lower associations of these items to food neophobia scores. PCA results also showed that the Second Principal Component clearly separates reversed (negative correlation) from unreversed items (positive correlation). In fact, the relationship between FNS and willingness to try two unfamiliar foods (aloe vera drink and rice sesame sweet) was confirmed ($p < 0.05$). In conclusion, the proposed Spanish version of the FNS performs properly with Spanish consumers.

1. Introduction

The availability of new foods is growing very rapidly and has stimulated interest in the response of consumers to novel foods. There is a current trend towards cultural diversity and globalization with an increased demand for different kinds of food products with respect to what has traditionally been available. In the past it was assumed that consumers would accept new foods if there was a specific and tangible benefit associated with their consumption (Frewer, Scholderer, & Lambert, 2003). Nowadays, research on this topic has shown that the acceptance of new foods and food obtained from new technologies regardless of their benefits on human health varies considerably. Food neophobia research studies quantify and categorize peoples' level of neophobia by their tendency to approach or avoid novel foods (Pliner, 1994). Arvola, Lähteenmäki, and Tuorila (1999) showed that neophobic people have a tendency to avoid new foods, and also lowers the acceptance and/or liking of these foods. In a more recent study, Tuorila et al. (2008) showed that neophobia in consumers negatively affects liking score expectations of different foods. In other studies about neophobia and functional foods, it was found that a high degree of neophobia negatively affects the disposition to consume functional foods (Labrecque, Doyon, Bellavance, & Kolodinsky, 2006; Urala & Lähteenmäki, 2004).

Moreover, food neophobia has been the subject of many studies over the last two decades in several countries, as it affects both the quality and variety of foods in the diet and may also be considered as an important factor in dietary studies (Falciglia, Couch, Gribble, Pabst, & Frank, 2000; Dovey, Staples, Gibson, & Halford, 2008).

The psychometric tool, Food Neophobia Scale (FNS), developed by Pliner and Hobden (1992) provided a significant development in food neophobia research. This scale consists of a questionnaire of five positive and five negative statements about food or situations related to food consumption. People complete the questionnaire indicating the level at which they agree or disagree with 10 statements in a seven point Likert scale from "strongly disagree" to "strongly agree". The internal consistency of the FNS has been verified by different laboratories by using the responses of different groups of people (Pliner & Hobden, 1992; Tuorila, Meiselman,

* Corresponding author. Address: Escuela Técnica Superior de Ingenieros Agrónomos, Avenida Complutense s/n, 28040 Madrid, Spain. Tel.: +34 91 3365844; fax: +34 91 3365870.
E-mail address: carolina.chaya@upm.es (C. Chaya).

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http://dx.doi.org/10.1016/j.foodqual.2012.09.007

Bell, Cardello, & Johnson, 1994). Studies have shown that this scale has been used to predict with high precision, the consumers response to new foods (Pliner & Hobden, 1992; Raudenbush & Frank, 1999). There has been concern about the meaning and interpretation of individual FNS statements in different populations and cultures. Ritchey, Frank, Hursti, and Tuorila (2003) validated and compared different countries and showed that FNS is not unidimensional (not all the items showed the same phenomenon). They recommended discarding two of the ten items in the scale (items 5 and 9). An acceptable fit was achieved for six items with data from the USA, Sweden and Finland (items 5 and 9 were discarded), but FNS with the original 10 items, provided an excellent fit to the data from the USA and Swedish samples.

Although the acceptance of a new product would be affected by the degree of consumers' neophobia, few researchers have taken this into account when carrying out their investigations on product development, and have also ignored the potential impact that this personality trait may have on consumer test results conducted on new foods product. In general, studies which evaluate food acceptance of new products focus on demographic factors when recruiting and selecting consumers, and it is possible that this information does not explain the variability in test results (Henriques, King, & Meiselman, 2009). There is little information about food neophobia in Mediterranean countries, and in Spain, there are few studies based on testing the FNS in the Spanish language, as well as its application among Spanish people (Barrios & Costell, 2004; Villegas, Carbonell, & Costell, 2008). Therefore, more data on food neophobia among the Spanish population is needed. The aim of this study is firstly to propose and test a Spanish version of the FNS using different psychometric measurements and secondly to provide information about food neophobia among the Spanish population.

2. Materials and methods

2.1. Consumer sample

A total of 309 participants of various age and education in Madrid, Barcelona and Valencia were recruited. Demographic variables and their breakdown among respondents are shown in Table 1.

2.2. Procedure

Participants completed the FNS, which was translated into Spanish (Table 2) according to the parallel back-translation procedure (Brislin, 1986). FNS statements were rated by each individual on a 7-point scale from "strongly agree" to "strongly disagree". Fifty respondents then repeated the test again 20 days later.

The individual FNS scores were computed as the sum of ratings giving 10 statements, after the five negative items (1,4,6,9,10) had been reversed (theoretical range 10–70). The FNS scores were split into tertiles based on approximately 33% membership in each group, the lowest tertile was defined as the "low neophobia" group and the highest tertile as the "high neophobia" group.

Table 1
Demographic variables and their breakdown among respondents (n = 309).

Characteristic	Breakdown	Total sample	Madrid	Barcelona	Valencia
Gender	Male	136 (44%)	64 (48%)	37 (39%)	35 (43%)
	Female	173 (55%)	69 (52%)	58 (61%)	46 (57%)
Age	1: <25	50	41	2	7
Groups	2: 25–36	70	24	16	30
	3: 37–48	82	22	38	22
	4: 49–60	64	30	19	15
	5: >60	43	16	20	7
Total of participants		309	133	95	81

Table 2
Food Neophobia Scale original version and Spanish proposed version.

Spanish items	English items
1. (R) Estoy constantemente probando alimentos nuevos y diferentes	1. (R) I am constantly sampling new and different foods
2. No confío en los alimentos nuevos	2. I don't trust new foods
3. Si no conozco qué hay en un alimento, no lo pruebo	3. If I don't know what a food is, I won't try it
4. (R) Me gustan las comidas de países diferentes	4. (R) I like foods from different cultures
5. La comida étnica me parece demasiado rara para comer	5. Ethnic food looks weird to eat
6. (R) En fiestas con comida, pruebo nuevos alimentos	6. (R) At dinner parties, I will try new foods
7. Me da miedo probar alimentos que nunca he probado antes	7. I am afraid to eat things I have never had before
8. Soy muy especial con los alimentos que como	8. I am very particular about the foods I eat
9. (R) Comería casi de todo	9. (R) I will eat almost anything
10. (R) Me gusta probar nuevos restaurantes étnicos	10. (R) I like to try ethnic restaurants

(R) Reversed items.

2.3. Methodology

In order to test the Spanish version of the FNS used in this study, several psychometric measurements were computed. Reliability of the FNS was assessed by calculating internal consistency (Cronbach Alpha); (Cronbach, 1951) and temporal stability by test–retest (Intraclass correlation). Test–retest stability was assessed by asking a portion of the consumers (11.7%) to complete the FNS twice, with a 20 days interval between the test and retest. Item-total correlation was measured with Pearson correlation coefficient while data obtained were evaluated by examining the factor structure of the FNS scores by means of Principal Component Analysis (PCA).

The effect of age and gender on the level of food neophobia was assessed by mixed model ANOVA, and the HSD Tukey test was applied when significant results were found.

One month later, food neophobia behavior was tested on a reduced group of consumers from Madrid (n = 50) by means of a questionnaire of expected liking and willingness to try two unfamiliar foods in the Spanish market (aloe vera drink and rice-sesame sweet). The relationship between FNS scores and willingness to try unfamiliar foods was analyzed by mixed model ANOVA and HSD Tukey test. The correlation coefficients were also computed between neophobia total scores and willingness to try, and also neophobia total scores and expected liking for both products.

3. Results and discussion

3.1. Descriptive results

Results of each questionnaire item and on the total FNS score in test and retest are shown in Table 3. FNS scores ranged from 10 to 66. Spanish food neophobia mean value was 31.74 (S.D. 10.98). Higher values were found in the mean FNS scores of Korean respondents 33.5 (SD = 9.0) (Choe & Cho, 2011) and in Lebanese students, the scores were 36.4 (SD = 9.8) (Olabi, Najm, Baghdadi, & Morton, 2009). Pliner and Hobden also reported a slightly higher average score, compared to those obtained from the Spanish con-