



Assessing childhood food neophobia: Validation of a scale in Italian primary school children



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ABSTRACT

Most of the studies published on childhood food neophobia rely on parents' reports of their children's degree of neophobia and not on children's reports. Information about children's food behavior obtained from questionnaires provided to the parents may be misleading because relying solely on parent's reports underestimates the role of the child in the process. The aim of the present study was to develop and validate a self-report measure of food neophobia designed for Italian primary school children by adapting the Food Neophobia Scale (FNS) proposed by Pliner and Hobden in 1992. The Italian Child Food Neophobia Scale (ICFNS) consists of 8 items (4 neophobic and 4 neophilic). Simple and age-appropriate vocabulary was used, and items were slightly modified to describe situations likely to be familiar to children. The ICFNS was tested on a sample of 491 6- to 9-year-old Italian children. Internal consistency and test–retest reliability were satisfactory. External validity data showed that the ICFNS predicted both the children's willingness to taste and liking of novel food. The results analyzed by age group indicated that younger children (6 years old) were not repeatable between the first and second administration of the questionnaire. Additionally, the ICFNS scores for the 6- and 7-year-old children were not significantly correlated with either willingness to taste or liking one of the two novel foods tested. Therefore, the ICFNS can be reliably used with Italian primary school children starting from the age of 8 years and most likely as early as 7 years. For 6-year-old children, adapted administration methods are recommended to achieve reliable results. Developing scales to measure food neophobia directly in children has important implications for the study of childhood eating behavior and may be an effective tool for measuring children's willingness to try new food when administering school-based food educational programs.

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Introduction

Food neophobia (FN), defined as a reluctance to eat unfamiliar foods, is a characteristic that all omnivores share (Pliner & Hobden, 1992). FN is associated with the well-known “omnivore's dilemma”. Being an omnivore means having the desire to find new food resources to ensure that nutritional requirements are met; however, this search for variety is potentially dangerous because an unknown food may be poisonous (Fischler, 1990). A literature search focusing on “food neophobia” from 1992 until the present produced 202 articles, 52 of which concerned children. The reason for the systematic attention that FN has received in recent decades, especially among children, is that this personality trait has an effect on both the quality and variety of foods in the diet

(Falciglia, Couch, Gribble, Pabst, & Frank, 2000). High levels of FN among children are problematic with respect to both public health and education. Evidence for a negative relationship between FN and dietary variety in children has been reported (Falciglia et al., 2000; Koivisto & Sjöden, 1996; Skinner, Carruth, Bounds, & Ziegler, 2002) because neophobic children are less inclined to eat certain types of foods (e.g., fruits, vegetables and foods of animal origin) than their more neophilic peers (Cooke, Carnell, & Wardle, 2006; Galloway, Lee, & Birch, 2003; Nicklaus, Boggio, Chabanet, & Issanchou, 2005).

FN is measured through the Food Neophobia Scale (FNS) proposed by Pliner and Hobden (1992). This scale consists of five positive (neophilic) and five negative (neophobic) statements about food or situations related to food consumption. Participants completing the questionnaire are asked to indicate the level to which they agree or disagree with the 10 statements; responses are given on a 7-point agreement scale, ranging from “strongly disagree” to “strongly agree.” After reverse coding the responses for the

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neophilic statements, a total FNS score is then calculated by summing the ratings for each item; the higher the FNS score, the higher the food neophobia level. This scale was validated with adults in 1992 and was later used to develop a tool to measure food neophobia in children (Pliner, 1994). Pliner's work with children consisted of an observational study of neophobic behavior among 5-, 8- and 11-year-old children that measured their willingness to try familiar and unfamiliar foods presented to them; this observational study was paired with the corresponding parent's prediction of their child's willingness to try familiar and unfamiliar foods and overall neophobic behavior. The Child Food Neophobia Scale (CFNS) proposed by Pliner (1994) is completed by parents and consists of the original FNS items couched in terms of children's behavior. In her study, Pliner found a moderate relationship between the level of neophobia observed in children choosing foods to taste (calculated as the ratio of unfamiliar foods tasted to familiar foods tasted), both parents' beliefs about how willing their child was to try unfamiliar food, and the parents' prediction about their child's level of neophobia (Pliner, 1994). Since 1994, the CFNS has been widely used to measure food neophobia among children of different ages (Cooke, Haworth, & Wardle, 2007; Cooke, Wardle, & Gibson, 2003; Cooke et al., 2006; Coulthard & Blissett, 2009; Dovey, Taylor, Stow, Boyland, & Halford, 2011; Galloway et al., 2003; Howard, Mallan, Byrne, Magarey, & Daniels, 2012; Mustonen, Oerlemans, & Tuorila, 2012; Mustonen & Tuorila, 2010; Russell & Worsley, 2008; Wardle, Carnell, & Cooke, 2005). This means that most of the studies published on children's willingness to try novel food include parents' reports of their children's degree of neophobia but not children's self-reports. Information about children's food behavior obtained from questionnaires provided to the parents may be misleading because, although parents play a crucial role in their children's diet, relying solely on parent's reports of their children's food neophobia underestimates the role of the child in the process (Aldridge, Dovey, & Halford, 2009). In addition, child and maternal food neophobia are not always significantly correlated (Tan & Holub, 2012), and parents may sometimes project their own behaviors onto those of their children (Mata, Scheibehenne, & Todd, 2008). There are a few examples in the literature of the use of the FNS (Falciglia et al., 2000; Koivisto Hursti & Sjöden, 1997; Koivisto & Sjöden, 1996) or a slightly modified version of it (Skinner et al., 2002) with children. However, in these studies, children and especially younger children completed the questionnaire with the aid of their parents. Thus, it is not clear whether the resulting scores reflect the children's or their parents' view of their degree of food neophobia.

The obvious problem of asking children to respond to the adult FNS items is that children may not understand the situations described in some of the items (e.g., "ethnic restaurants" and "dinner party"), and the younger children may have difficulty responding on a 7-point agreement scale. Furthermore, some of the FNS vocabulary is inappropriate for children (e.g., "constantly" and "particular") (Loewen & Pliner, 2000).

Only recently researchers have tried to develop self-report questionnaires tailored for children to study the degree of their food neophobia. We are aware of only two examples in the literature of such questionnaires. The first is a modified version of the adult FNS, which was used with 8- to 10-year-old French children (Reverdy, Chesnel, Schlich, Köster, & Lange, 2008); however, this version has not been validated. The second is a validated French version (Rubio, Rigal, Boireau-Ducept, Mallet, & Meyer, 2008) of the Food Situations Questionnaire (FSQ) (Loewen & Pliner, 2000) used with 5- to 8-year old children. Additionally, Hollar, Paxton-Aiken, and Fleming (2013) recently developed the Fruit and Vegetable Neophobia Instrument (FVNI), validated with primary school children (8–10 years old) to specifically study children's attitudes toward new fruits and vegetables. This questionnaire was

developed by modifying aspects of both the FNS and the CFNS, and it consists of two subscales (one for fruits and one for vegetables) that each comprises 9 items in which the word "food" is replaced by "fruit" and "vegetable," respectively.

Developing scales to measure children's food neophobia directly has important implications for the study of childhood eating behaviors, and these scales may be effective tools for measuring children's willingness to try new food when administering school-based food educational programs. However, when developing questionnaires tailored for children, several precautions should be taken; items should be modified so that they describe situations that are likely familiar to children, employ terms that are age-appropriate, and use a response format that can be easily understood (Loewen & Pliner, 2000). Additionally, there has been concern over the meaning and interpretation of individual FNS statements among different populations and cultures (Fernández-Ruiz, Claret, & Chaya, 2013). Thus, care should be taken in adapting the questionnaire to account for children's food cultures.

The present study is part of a larger research program funded by Regione Lombardia aimed at improving healthy food consumption among Italian primary school-aged children. This research project involved the application of a school-based intervention to a large cohort of Italian children (Laureati, Bergamaschi, & Pagliarini, 2014) and the measurement of the impact of the intervention on several variables, such as children's willingness to taste and their liking of fruits and vegetables, food neophobia, nutritional status and food behavior. In view of the importance of studying FN in children and the lack of information about this personality trait among children residing in Mediterranean countries, the specific aim of the present study was to develop and validate a self-report measure of food neophobia designed for Italian primary school children. This was an ecological study performed at school to be as representative as possible of an everyday life situation.

Material and methods

Children

A total of 594 children (303 boys and 291 girls) aged 6–9 years (mean age \pm SD: 7.9 \pm 1.0 years) were recruited from three schools in the metropolitan area of Milan (Italy). The schools shared the same refectory and had the same organization of lessons. The children were recruited based on a consent form completed by their parents. Children met the following criteria: not subjects to reported taste or smell disorders, not on a specific diet, not suffering from food allergies. The study was performed in adherence with the principles established by the Declaration of Helsinki. The protocol was approved by the local Institutional Ethics Committee.

Preliminary experiment: design of the questionnaire

In this first stage of the study, the original version of the adults FNS (Pliner & Hobden, 1992) was carefully examined to establish whether the items, vocabulary and response format would be appropriate for Italian primary school children. After this first examination, we had concerns that children would not properly understand the term "ethnic." Thus, the original scale was reduced to 8 items, 4 related to neophilic and 4 related to neophobic attitudes. More specifically, the items "Ethnic food looks too weird to eat," "I like trying new ethnic restaurants" and "I like foods from different countries," which were present in the original FNS, were removed and replaced by the item "I like trying new

food and tastes from other countries". We also decided to reduce the number of response options of the agreement scale from 7 to 5 because we felt that the youngest children may have difficulty discriminating between 7 response options. Additionally, each response on the 5-point scale was represented by a facial expression, which we believed would help the child better understand the level of agreement or disagreement for each of the 8 items (from left to right, the 5-point scale was "Very false for me," "False for me," "So-so," "True for me," "Very true for me"). To ascertain that children understood all the items and the scale, the questionnaire, after careful translation into Italian, was tested in a pilot study with a group of 30 children (16 girls and 14 boys who ranged in age from 6 to 10 years) recruited from a childhood community center in Milan. Children received the questionnaire in a collective setting (small groups of 5–6 children) and were asked to respond to each item using the 5-point scale. During the completion of the questionnaire, questions and comments raised by the children were recorded by an experimenter. The pilot test revealed that the children had difficulty understanding one item with a double negative (i.e., "If I don't know what a food is, I won't try it") and were not familiar with the situation described by the item "At dinner parties, I will try new food." Thus, these two items were slightly modified to eliminate the double negative and to include situations that are more familiar to children (i.e., "When I am at a friend's party, I like to try new foods"). With these adjustments, children seemed to properly understand the meaning of all of the items. Questionnaire internal consistency evaluated in the pilot study was 0.77. The Italian Children Food Neophobia Scale (ICFNS) that was developed to be used in the main study is included in [Appendix](#).

Main experiment: validation of the questionnaire

The ICFNS was first presented to 594 children (none of whom were involved in the preliminary experiment) in their classrooms immediately prior to their mid-morning break in the presence of their teacher and an experimenter. Children received the ICFNS, and the experimenter explained to them how to complete the questionnaire. For each item, the children were asked to indicate the degree to which they considered the statement to be true for them, using the 5-point facial scale. To evaluate the reliability of the scale, the same children were invited to repeat the test one week later. Only 491 of the initial 594 children were present at this second test administration. The second test was administered using the same conditions as the first test, that is, the questionnaire was self-administered in a collective setting. The administration method was identical for all children.

To assess the predictive validity of the ICFNS, the same 491 children were invited to participate in a third task one week later consisting of an evaluation of the children's willingness to taste and liking of two unfamiliar foods, namely daikon and radish. Only 475 (radish) and 468 (daikon) of the 491 children participated in the food task. The vegetables were served to the children in plastic cups at 10:30 am, immediately prior to the mid-morning break in the classroom in the presence of their teacher and an experimenter. The presentation order of the two items was balanced across the children. The children were presented with each of the items and asked to indicate whether each food item was familiar or not (answer: yes/no), and whether they were willing to taste it (answer: yes/no). Then, they were requested to take a small bite and indicate how much they liked it on a 7-point hedonic facial scale (Pagliarini, Gabbiadini, & Ratti, 2005; Pagliarini, Ratti, Balzaretto, & Dragoni, 2003).

Data analysis

For each child, a neophobia score ranging from 8 to 40 was calculated (neophilic items scores were reversed). High scores indicated higher food neophobia. Reliability of the ICFNS was assessed by calculating internal consistency (Cronbach's alpha) and temporal stability by test–retest evaluation. Mean values for each item in the test–retest evaluation were compared through paired *t*-tests ($p < 0.05$). Correlations between items were measured using Pearson correlation coefficients. The relationship between each item in the test–retest evaluation was further evaluated with Principal Component Analysis (PCA).

The relationship between the ICFNS scores and children's willingness to try and how much they liked unfamiliar foods was analyzed by calculating Pearson correlation coefficients and PCA. In addition, to further interpret the relationship between children's liking and willingness to try unfamiliar foods and neophobia, the frequency distribution of FNS scores was calculated and children were divided into 3 groups: "low neophobia" (children in the lowest quartile, ICFNS scores ≤ 17 , $n = 124$), "medium neophobia" (children in the second and third quartile, ICFNS scores ≥ 18 and ≤ 24 , $n = 208$) and "high neophobia" (children in the highest quartile, ICFNS scores ≥ 25 , $n = 143$). Liking data were examined using a mixed model ANOVA that included subjects (random effect), neophobia level (fixed effect) and their interaction as factors. Willingness data were compared using Chi-Square test. The SAS/STAT statistical software package version 9.3.1 (SAS Institute Inc., Cary, USA) and The Unscrambler X software (CAMO Software AS, Oslo, Norway) were used for the data analysis.

Results

Reliability of the questionnaire

The internal consistency of the ICFNS was satisfactory (Cronbach's alpha = 0.71; $n = 8$). Total mean ICFNS scores and individual item scores for the test–retest evaluation are reported in [Table 1](#). According to paired *t*-test comparisons, responses to the items and the total scores did not differ significantly ($p < 0.05$) between the first and second test administration, which indicates good repeatability over the two sessions. The correlation between the first and second administration of the whole scale was 0.61. The relationship between the items in the test–retest evaluation was further investigated through PCA ([Fig. 1](#)). The total variance explained by the first two PCs was 37%. Items at first and second evaluations were positioned near in the bi-dimensional space, confirming a satisfactory temporal stability of children's food neophobia measured by the ICFNS. All of the items showed a

Table 1

Mean scores and standard deviation (SD) of each item of the ICFNS ($n = 491$). Comparison between mean values by paired *t*-test ($p < 0.05$). (R) indicates the neophilic items for which the score was reversed.

Item	Test		Re-test		<i>p</i> -Value
	Mean	SD	Mean	SD	
1(R)	2.7	1.2	2.8	1.3	n.s.
2	2.8	1.4	2.7	1.4	n.s.
3	2.9	1.4	2.8	1.4	n.s.
4(R)	2.3	1.4	2.3	1.3	n.s.
5(R)	2.3	1.3	2.2	1.3	n.s.
6	2.5	1.3	2.5	1.3	n.s.
7	2.6	1.4	2.6	1.4	n.s.
8(R)	2.9	1.3	2.9	1.3	n.s.
Overall	21.0	5.8	20.8	6.1	n.s.

n.s. – not significant difference.

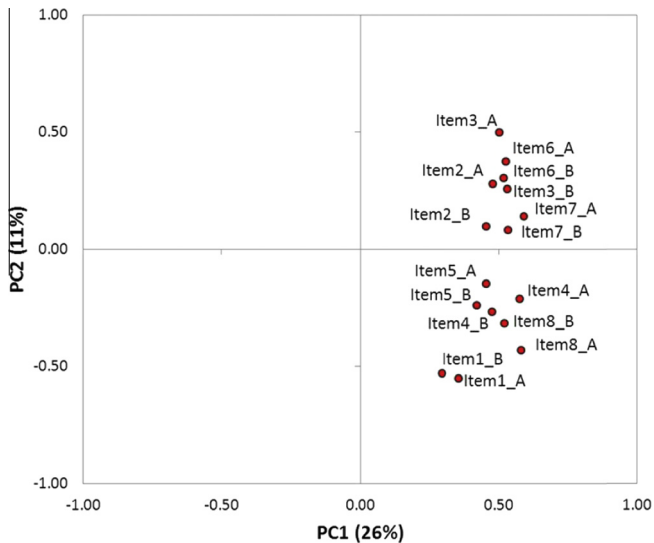


Fig. 1. Principal Component Analysis performed on scores of each item (Items 1–8) at test (A) and re-test (B) evaluation ($n = 491$).

positive correlation with PC1 (26% explained variance), meaning that they are consistent in measuring food neophobia, whereas PC2 (11% explained variance) separated the neophobic items (1, 4, 5 and 8; negative loadings on PC2) from the neophilic items (2, 3, 6 and 7; positive loadings on PC2). In other words, the additional information provided by the PCA plot is that items accomplish the purpose of measuring two opposite “directions” (neophilic vs neophobic) of the same variable.

Predictive validity of the questionnaire

To test the predictive validity of the ICFNS, the children were asked to perform a food task consisting of an evaluation of their willingness to try and how much they liked two unfamiliar foods (i.e., daikon and radish). The results confirmed that daikon and radish were considered unfamiliar to 95% and 70% of the children, respectively. The children's willingness to try and liking of the two food items were calculated according to children's food neophobia level (i.e., low, medium and high neophobia). The results are reported in Fig. 2a–b. Willingness to try the two food items differed according to neophobia level; the children with low levels of food neophobia were significantly more willing than the children with high levels of food neophobia to taste both daikon ($\chi^2 = 9.1$, $df = 2$, $p < 0.05$) and radish ($\chi^2 = 17.4$, $df = 2$, $p < 0.001$). Additionally, the degree to which the children liked unfamiliar foods decreased with increasing levels of neophobia because the children with a high level of food neophobia liked both daikon ($F_{(2,467)} = 8.28$, $p < 0.001$) and radish ($F_{(2,472)} = 2.51$, $p = 0.05$) significantly less than did the children with low food neophobia.

Results from the ICFNS and children's reports of their liking and willingness data were then analyzed using PCA to investigate the relationship among the variables from a multidimensional point of view (Fig. 3). The total variance explained by the first two PCs was 65%. Food neophobia measured through the ICFNS had a positive loading on PC1 (40% of the explained variance) and was negatively correlated with the children's willingness to try and liking of both daikon and radish, which loaded negatively on PC1. The PCA plot provides the additional information that willingness and liking of both food items were positioned very near one another in the multidimensional space,

meaning that children's willingness to taste a novel food reflected the degree to which they reported liking that food. These results indicate that the more neophobic children are (as evaluated by ICFNS), the less willing they are to try a new food and the less they like it.

Questionnaire results according to children's age

Because the children involved in the study were 6–9 years old and large differences from a cognitive point of view are reported in this age range (ASTM E2299, 2003; Guinard, 2001), the ICFNS scores were calculated according to the children's age. Comparisons of the ICFNS scores obtained in the test–retest evaluation by age group are reported in Table 2. Although the overall ICFNS scores between the test and retest were not significantly different ($p < 0.05$) for all age groups, younger children (6 years old) had clear difficulties reliably answering five out of the 8 items: all 4 of the neophilic items and 1 neophobic item. All the other age groups performed the task well and were reliable in answering all of the items, with the exception of item 1 for the oldest children.

We also analyzed the correlations between the ICFNS scores and the food task (i.e., willingness to try and liking of unfamiliar food) by age group (Table 3). The results revealed that the overall ICFNS scores were negatively and significantly correlated with both willingness to try and liking unfamiliar food. However, for younger children (6 and 7 years old) coefficients were correlated to willingness to try and liking radish but not daikon.

Discussion

The aim of this study was to develop and validate a self-administered questionnaire on food neophobia tailored to Italian primary school children by adapting the FNS proposed by Pliner and Hobden (1992). It was shown that simple, age-appropriate vocabulary and items modified to describe situations likely to be familiar to children facilitated the self-administration and understanding of the questionnaire.

The ICFNS internal consistency and reliability over the test and retest sessions were satisfactory, with coefficients comparable to those found in previous research on children food neophobia assessment (Loewen & Pliner, 2000; Reverdy et al., 2008). Predictive validity data showed that the ICFNS scores reflected the children's liking of and willingness to taste unfamiliar food. Although the ICFNS coefficients were low overall, they were significantly and negatively correlated with willingness to taste and liking of unfamiliar food. Our correlation values were comparable to those obtained in previous studies that used a behavioral food task to examine the external validity of questionnaires related to children's willingness to try unfamiliar food (Loewen & Pliner, 2000; Pliner, 1994; Reverdy et al., 2008). The relatively weak relationship between the ICFNS and children's liking of and willingness to try new food may be explained by the fact that these tests measure different things. Indeed, Pliner (1994) differentiated neophobia as an actual behavior and a personality trait. Neophobia as a personality trait is usually evaluated by a questionnaire, in our case the ICFNS, whereas the actual behavioral assessment of children's willingness to try and liking of new food are the expression of this trait and are generally measured with a food task (Rigal et al., 2006).

The predictive validity of the ICFNS was further confirmed when the children were divided according to the degree of neophobia. It was shown that neophobic children were significantly less willing to taste the new food and reported liking the new food significantly less than their neophilic peers. Thus, we can

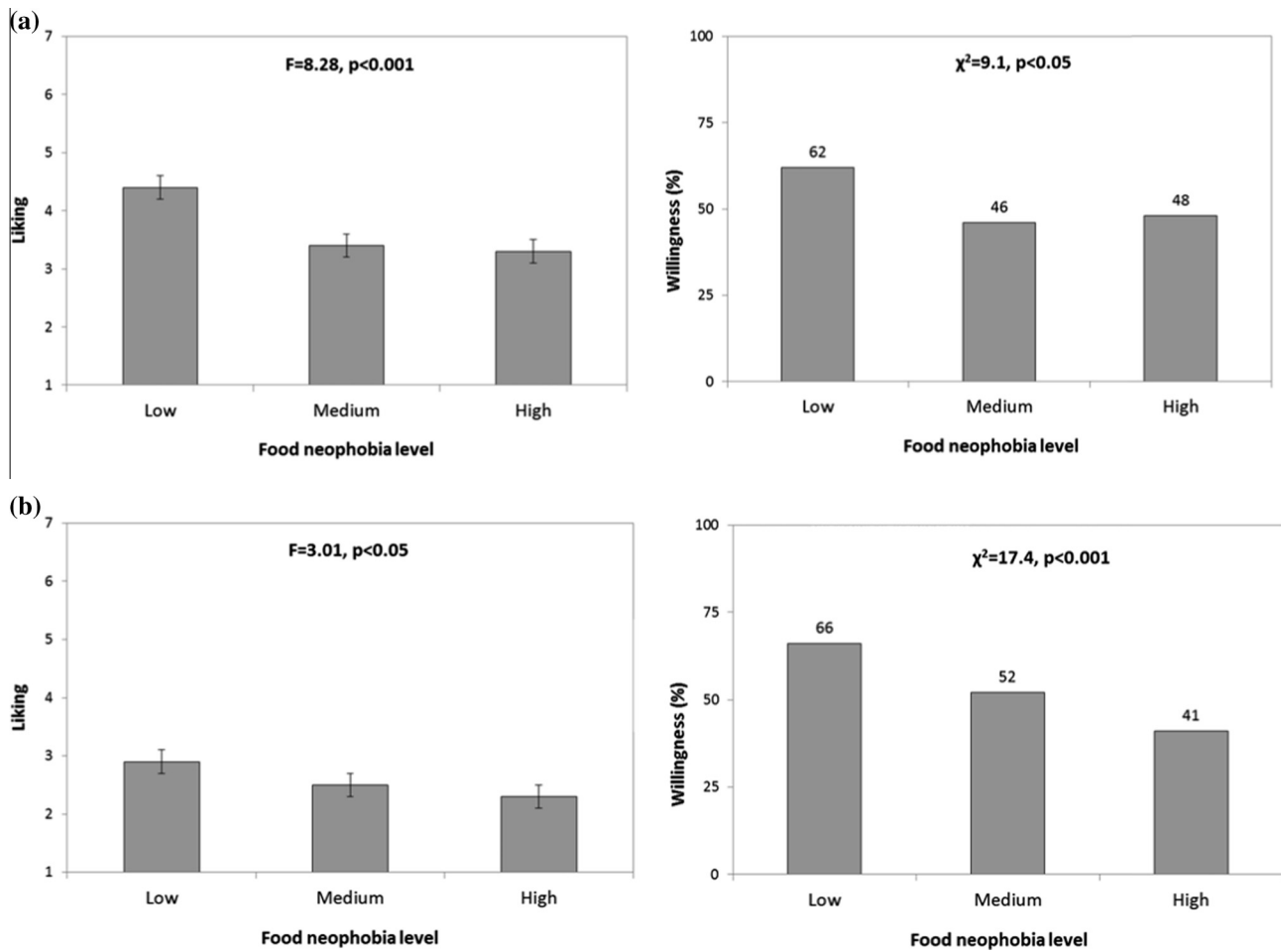


Fig. 2. (a–b) Willingness to try and liking of unfamiliar foods (daikon: a, $n = 468$; radish: b, $n = 475$) by children's food neophobia level.

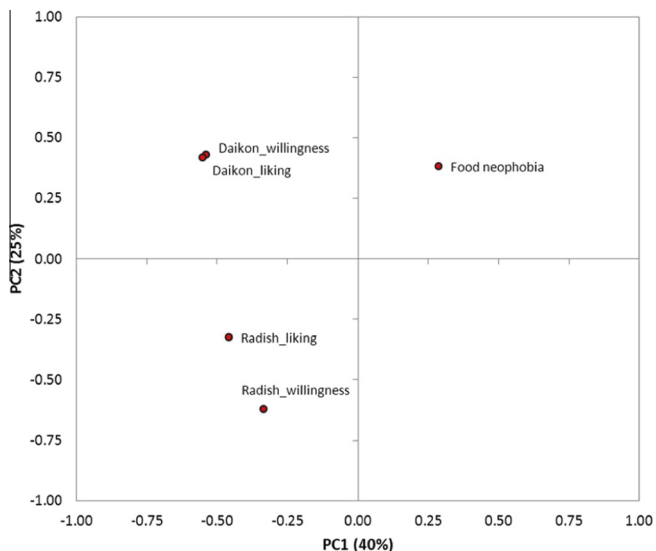


Fig. 3. Principal Component Analysis performed on food neophobia scores and willingness to try and liking of unfamiliar foods (daikon and radish).

reasonably state that self-reports by children are good predictors of their willingness to taste and liking of novel food. There is evidence in the literature of the predictive validity of questionnaires

evaluating neophobia through the use of food pictures and listing (Rubio et al., 2008). Although some authors report that the use of pictures of food is a reliable method to evaluate children's food preferences (Guthrie, Rapoport, & Wardle, 2000), we believe that providing children with real food in an actual food context (e.g., midmorning snack at school) is the best way to achieve more representative and ecologically valid results. The naturalistic environment is an important point to consider when studying factors linked to children's food behavior. In everyday life, the perceived danger of food may be greater than that felt in the safety of a laboratory so that the effects of food neophobia may be underestimated when measured in a laboratory setting (Russell & Worsley, 2008).

The questionnaire validity was further investigated by considering variations according to the children's age. It was shown that the results for younger children (6 years old) were not reliable between the first and second administrations of the questionnaire. Additionally, in contrast to the older children (8 and 9 years old), the correlation coefficients between the ICFNS and the food task were not significant for one of the two food items used among the 6-year-old children. The results for the 7-year-old children appeared to be reliable in the test–retest evaluation, but their ICFNS scores, like those of the 6-year-old children, were significantly correlated with willingness to try and liking data for only one of the two food items. This finding suggests that younger children and especially the 6 years olds may have difficulty understanding the task. According to Piaget's stages of cognitive

Table 2

Mean scores of each item of the ICFNS by children's age (6 years, $n = 110$; 7 years, $n = 156$; 8 years, $n = 136$; 9 years, $n = 89$). p -Values are obtained according to paired t -tests ($p < 0.05$).

Item	Age (years)											
	6			7			8			9		
	Test	Re-test	p	Test	Re-test	p	Test	Re-test	p	Test	Re-test	p
1R	2.9	2.6	*	2.9	3.0	n.s.	2.7	2.8	n.s.	2.3	2.7	*
2	2.9	2.8	n.s.	3.0	2.8	n.s.	2.8	2.6	n.s.	2.4	2.6	n.s.
3	3.3	3.4	n.s.	2.9	2.8	n.s.	2.7	2.5	n.s.	2.7	2.4	n.s.
4R	2.7	2.1	***	2.3	2.4	n.s.	2.3	2.4	n.s.	2.1	2.3	n.s.
5R	2.5	2.2	*	2.3	2.1	n.s.	2.2	2.0	n.s.	2.3	2.3	n.s.
6	2.9	3.1	n.s.	2.4	2.4	n.s.	2.5	2.3	n.s.	2.1	2.3	n.s.
7	3.0	3.5	**	2.5	2.3	n.s.	2.3	2.2	n.s.	2.5	2.4	n.s.
8R	2.8	3.1	*	2.9	2.8	n.s.	3.0	2.8	n.s.	2.8	3.0	n.s.
Overall	23.0	22.8	n.s.	21.2	20.6	n.s.	20.5	19.6	n.s.	19.2	20.0	n.s.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 3

Correlations between ICFNS, willingness to try and liking of daikon and radish by age groups.

Age (years)	Daikon		Radish	
	Liking	Willingness	Liking	Willingness
6	-0.10	-0.01	-0.12 ^(*)	-0.19*
7	-0.05	-0.11	-0.23**	-0.22**
8	-0.23**	-0.26**	-0.18*	-0.23**
9	-0.39***	-0.21**	-0.17*	-0.32**
Overall	-0.14**	-0.11*	-0.16***	-0.25***

^(*) $p < 0.10$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

development (Wadsworth, 1984), 6-year-old children are limited in their logical thinking abilities, including limited verbal skills, short attention span, and difficulties in task comprehension (Guinard, 2001). Because validation of a new tool implies using the same methodology and standardized administration for all subjects, the administration method was the same across all age groups of children in the present study. This may explain the lower performance of the youngest children. It is likely that 6-year-old children need specific instructions and help when asked to complete the questionnaire. Examples of administration methods adapted for younger children (e.g., questionnaires administered in an individual instead of collective setting and questions read aloud by an experimenter) are present in the literature and have shown a positive result when validating questionnaires among children as young as 5 years old (Rubio et al., 2008).

In conclusion, we believe that we have successfully accomplished the goal of developing a questionnaire to measure food neophobia, which relies on children's reports rather than their parent's reports. More specifically, the questionnaire is tailored for Italian primary school children and takes into consideration aspects related to their specific culture. The questionnaire can be reliably used with Italian primary school children starting from the age of 8 years and most likely as early as 7 years. For 6-year-old children, adapted administration methods are recommended to achieve reliable results. Food neophobia is a major public health

concern. The ICFNS represents a valuable tool for practitioners to evaluate interventions or policies focused on decreasing children's food neophobia and increasing their preference for, and promoting a positive attitude toward, the consumption of healthy foods such as fruits and vegetables.

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Appendix 1.

Original version of the FNS (a) and ICFNS version with English translation reported in italic type (b). Items 4, 5 and 10 of the original FNS were replaced by Item 4 of the ICFNS. (R) indicates the neophilic items for which the score was reversed. For each item of the ICFNS, the 5-point agreement scale translation is as follows: Falsissimo = Very false for me; Falso = False for me; Così così = So-so; Vero = True for me; Verissimo = Very true for me.






(a)

FNS (Pliner & Hobden, 1992)

1. I am constantly sampling new and different foods (R)
2. I don't trust new foods
3. If I don't know what a food is, I won't try it
4. I like foods from different countries (R)
5. Ethnic food looks weird to me
6. At dinner parties, I will try new food (R)
7. I am afraid to eat things I have never had before
8. I am very particular about the foods I eat
9. I will eat almost anything (R)
10. I like to try ethnic restaurants (R)






(b)

1. Mangio quasi tutti i giorni cibi nuovi e diversi dal solito (R)
I eat almost every day new and unusual foods (R)






Falsissimo Falso Così così Vero Verissimo

2. Non mi fido dei cibi nuovi
I don't trust new foods






Falsissimo Falso Così così Vero Verissimo

3. Se un cibo è nuovo, non lo assaggio
If a food is new, I don't try it






Falsissimo Falso Così così Vero Verissimo

4. Mi piace provare sapori e cibi strani, diversi dal solito e provenienti da altri Paesi (R)
I like to try weird tastes and foods, which are unusual and coming from different countries (R)






Falsissimo Falso Così così Vero Verissimo

5. Quando sono alla festa di un amico mi piace assaggiare cibi nuovi (R)
When I am at a friend's party, I like to try new foods (R)






Falsissimo Falso Così così Vero Verissimo

6. Ho paura di assaggiare un cibo che non ho mai mangiato prima
I am afraid to eat food I have never had before






Falsissimo Falso Così così Vero Verissimo

7. Sono molto schizzinoso quando si tratta di mangiare
I am very fussy when it's a matter of food

Falsissimo Falso Così così Vero Verissimo

8. Mangio tutto, ma proprio tutto! (R)
I really eat everything! (R)

Falsissimo Falso Così così Vero Verissimo

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