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

Monica Laureati *, Valentina Bergamaschi, Ella Pagliarini

Department of Food, Environmental and Nutritional Sciences (DeFENS), Università degli Studi di Milano, Via Celoria 2, 20133 Milano, Italy

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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.

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

* Corresponding author. Tel.: +39 (0)250319179; fax: +39 (0)250319190.
E-mail address: monica.laureati@unimi.it (M. Laureati).

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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 ± SD: 7.9 ± 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