



# Food neophobia and enjoyment of tactile play: Associations between preschool children and their parents



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## ABSTRACT

A cross-sectional study was conducted to examine whether the relationship between enjoyment of tactile play and food neophobia observed in children (Coulthard & Thakker, 2015) would be related to levels seen in their parents. One hundred and twenty six participants were recruited from playgroup centres in the Walsall area of the West Midlands, UK; 63 children (2–5 years; 30 girls and 33 boys) and 63 attendant parents (53 mothers and 10 fathers). Children and their parents' enjoyment of a tactile play task was rated by both the parent and a researcher, and questionnaire measures of food neophobia and tactile sensitivity were completed by the parent for both themselves and their children. Strong associations were found between parent and child scores across all the measures; food neophobia, tactile sensitivity and tactile play enjoyment. The variables most strongly related to child food neophobia were parental neophobia and enjoyment of tactile play (parent and child). These findings indicate that family resemblance exists not only for food neophobia, but for tactile sensory processing as well, and may represent a possible inherited route to neophobia. The findings strengthen the suggestion that tactile processing is associated with food neophobia although the causal nature of this relationship is still not known.

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## 1. Introduction

The avoidance of novel foods, referred to as the construct of food neophobia, can be seen to varying degrees in children from the age of 12 months (Pliner, 1994) reaching its height between the ages of two to six years (Addressi, Galloway, Visalberghi, & Birch, 2005). Food neophobia in children has a prevalence of around 20–30% (Wardle & Cooke, 2008) and is primarily associated with the rejection of foods from the categories of fruits, vegetables and proteins (Cooke et al., 2004; Cooke, Wardle, & Gibson, 2003; Howard, Mallan, Byrne, Magarey, & Daniels, 2012; Pliner & Pelchat, 1991). As the early childhood period is an important time for socialising children into healthy eating habits, the behaviour of food neophobia can lead to a reduced exposure to healthful fruits and vegetables (Cooke, Carnell, & Wardle, 2006).

There is evidence that food neophobia is a familial trait, with associations found between parents and children in both questionnaire (Falciglia, Pabst, Couch, & Goody, 2004; Pliner & Loewen,

1997) and behavioural food tasting studies (Pliner & Loewen, 1997). When the food environment is shared, as well as genetic inheritance, it is difficult to know how heritable food preferences are, and whether it is the implementation of strategies (Wardle, Carnell, & Cooke, 2005), schemas (Loewen & Pliner, 1999), modelling (Hobden & Pliner, 1995) and exposure (Cooke, 2007) that account for these relationships. However, studies with monozygotic and dizygotic twins have found food neophobia to be a highly heritable trait, especially in relation to vegetables and proteins (Cooke, Haworth, & Wardle, 2007; Faith, Heo, Keller, & Pietrobelli, 2013). This suggests there may be some inherent, biological contributors to variance in the neophobic food response.

Historically it was proposed that in order to expose a child to a food, and actually develop a preference for it, they must actually taste it, and exposure through other sensory modalities such as vision was not sufficient (Birch, McPhee, Shoba, Pirok, & Steinberg, 1987). However, recent questionnaire research has found an association between processing across a variety of sensory modalities and food acceptance, in particular food neophobia (Coulthard & Blissett, 2009; Davis et al., 2013; Farrow & Coulthard, 2012). In addition findings from behavioural studies suggest that children base their rejections of novel foods on visual appearance (Dovey

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et al., 2012; Heath, Houston-Price, & Kennedy, 2013) and tactile processing (Coulthard & Thakker, 2015; Nederkoorn, Jansen, & Havermans, 2015; Werthmann et al., 2015). Coulthard and Thakker (2015) found that enjoyment of the feel of sticky and messy food substances, in two games where children had to use their fingers to rescue figures, was associated with reduced food neophobia in children. One criticism of their study was that the sticky substances used in both the games, mashed potato and jelly, were food-based substances, and that the relationship with food neophobia may have been related to a reluctance to touch food substances (rather than the feel of the substances per se). Subsequently, Nederkoorn et al. (2015) has found a relationship between the children's evaluation of the feel of a variety of substances (food and non-food) and picky eating measures. There has been no research to date, whether the feel of non-food substances may be related to food acceptance. In addition there has been no research to look at tactile play in parents, and how it relates to levels seen in their children.

### 1.1. Rationale

The main aim of the current study was to replicate the relationship between enjoyment of tactile play and lower food neophobia in children found by Coulthard and Thakker (2015) but with the use of non-food sticky, messy substances. This was in order to distinguish whether it is dislike of touching messy food substances, or dislike of touching any messy substances, that is associated with food neophobia in children. A second aim was to examine whether the association between tactile play scores, tactile sensitivity and food neophobia in children would also be present in their parents. It was further expected child food neophobia would be associated with both parental neophobia and parent/child tactile variables.

## 2. Method

### 2.1. Participants

A convenience sample of 126 participants (63 parent–child pairs) were recruited from three playgroup settings around Walsall, a small town in the West Midlands region of the United Kingdom (UK). All participants were recruited during their usual afternoon sessions and the sample consisted of 30 female children and 33 male children aged between two and five years (mean = 3.33 SD = 1.00). The parents in the sample consisted of 53 mothers, 10 fathers. The age of the parents ranged from 23 to 43 years with a mean age of 31.33 years (SD = 4.33). Parents educational level ranged from having no qualifications to postgraduate level with the majority of the sample having acquired A-level qualifications (Equivalent to a high school diploma) or above ( $n = 46$ ). The majority of parents in the sample (62%) were of South Asian origin with the remainder of the parents being White-British (38%). Ethical approval was granted by De Montfort University Research Ethics Committee.

## 3. Materials

### 3.1. Demographic variables

The demographic variables measured were child sex, parental sex, child age, parental age, parental education (GCSE, A levels, degree), and ethnicity (White British, White European, South Asian, African, Caribbean and mixed ethnicity).

### 3.2. Tactile processing

#### 3.2.1. Tactile sensitivity (adults)

The tactile processing subscale of the Adolescent/Adult Sensory Profile is a 12-item questionnaire which is used to measure responses to tactile sensory information in everyday life (Dunn, 1999), of which seven items measured tactile sensitivity, an example of which would be 'I dislike the feeling of having my back massaged'. One of the items related to food textures, and was removed as a possible confound, leaving six items in the final score. The scale has been used and validated on samples of adults (Brown, Tolefson, Dunn, Cromwell, & Filion, 2001) but has not been as widely used in research as the child versions of the scale (Dunn, 1999). In the present study reliability of the scale was acceptable, with a Cronbach's Alpha score of  $\alpha = 0.69$ . Responses were marked in the present study on a five-point Likert type scale ranging from 'almost always, 5' to 'almost never, 1'. The subscale has a possible range of scores from 6 to 30 with a high score indicating a high level of tactile sensory sensitivity.

#### 3.2.2. Tactile sensitivity (children)

The tactile processing subscale of the Sensory Profile is a questionnaire devised for children consisting of a 18-item subscale in which parents are required to indicate how much each statement about tactile sensory responses was representative of their child's behaviour (Dunn, 1999). Eleven of the items relate to sensory sensitivity, for example 'Is sensitive to certain fabrics'. This measure has been used on child samples (e.g. Farrow & Coulthard, 2012) and results indicate that it is a reliable and validated measure (Miller-Kuhaneck, Henry, Glennon, & Mu, 2007). Internal reliability for this subscale in the present study was good (Cronbach's alpha;  $\alpha = 0.84$ ). Responses were indicated on a five-point Likert type scale ranging from 'always, 5' to 'never, 1', with a possible range of scores from 11 to 55, with a high score indicating a high level of tactile sensitivity.

### 3.3. Food neophobia

#### 3.3.1. Food neophobia (adults)

The Food Neophobia Scale is a 10-item scale used to measure an individual's willingness to eat novel foods (Pliner & Hobden, 1992). The scale has test–retest reliability and is an internally consistent measure of the trait (Cox & Evans, 2008). An example item used in the scale is, 'I am afraid to eat things I have never tried before', with responses give on a 7 point scale from 'extremely like me, 1' to 'extremely unlike me, 7'. Total scores range from 10 to 70 with higher scores indicating higher levels of food neophobia.

#### 3.3.2. Food neophobia (children)

The Child Food Neophobia Scale (CFNS) is a six item parental report scale modified by Wardle et al. (2005) for use with children from the original food neophobia scale. The CFNS is a reliable and widely used questionnaire which has been validated against behavioural measures of food neophobia (Pliner, 1994). An example item is 'My child does not trust new foods' Responses are on a four point scale, from, which the range possible responses being 4–24 with a high score indicating high levels of child food neophobia.

### 3.4. Tactile play task (cornflour and agar games)

The tactile play measure was based on a technique devised by Coulthard and Thakker (2015) to measure sticky, messy play in preschool children. The original tasks used mashed potato and jelly from which the children were required to 'rescue' a soldier. The two tactile play tasks developed for the present study were based on

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