

A Population-based Study of Preschoolers' Food Neophobia and Its Associations with Food Preferences

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ABSTRACT

Objective: This cross-sectional study was designed to investigate the relationships between food preferences, food neophobia, and children's characteristics among a population-based sample of preschoolers.

Design: A parent-report questionnaire.

Setting: Child-care centers, kindergartens, playgroups, day nurseries, and swimming centers.

Subjects: 371 two- to five-year-old Australian children.

Outcome Measures: Associations between food neophobia and the food preferences and characteristics.

Analysis: Analysis of variance, analysis of covariance, Pearson product-moment correlations, and Fisher χ test were used to estimate and compare the associations between these variables.

Results: Food neophobia was associated with reduced preferences for all food groups, but especially for vegetables ($r = -0.60$; $P < .001$). It was also associated with liking fewer food types ($r = -0.55$; $P < .001$), disliking more food types ($r = 0.42$; $P < .001$), the number of untried food types ($r = 0.25$; $P < .001$), a less varied range of food preferences ($r = -0.59$; $P < .001$), and less healthful food preferences overall ($r = -0.55$; $P < .001$). No significant relationships ($P < .01$) were observed between food neophobia and a child's age, sex, or history of breast-feeding.

Conclusions: The study confirms and extends results obtained in experimental research and population-based intake studies of food neophobia to children's everyday food preferences. The findings suggest that preschool children's everyday food preferences are strongly associated with food neophobia but not with children's age, sex, or history of breast-feeding. When aiming to influence children's food preferences, the effects of food neophobia and strategies to reduce it should be considered.

Key Words: food likes, preschool, children, Australia, food neophobia, food preferences

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INTRODUCTION

Food preferences are believed to play a central role in the prediction of human food choices,^{1,2} especially children's food choices.³ Although adult food and taste preferences have been relatively well studied,^{4,7} there have been few studies of preschool children's preferences outside the laboratory, in daily life. Understanding the child population's food preferences and their determinants is important for

progress in the prevention of the current obesity epidemic⁸ and improvement of children's poor food intakes.⁹⁻¹³

Food neophobia literally means "fear of new food."¹⁴ It is manifested in children as a reluctance to eat and/or avoid novel food.¹⁵ Although this trait may once have been adaptive in an evolutionary sense by reducing ingestion of potentially harmful toxins, much of the risk associated with the consumption of new types of food has been removed in current Western culture. As such, food neophobia may now be maladaptive, hindering the development of a range of preferences and hence consumption of a varied diet.¹⁶

Food neophobia has become a central construct in the food choice literature in recent years. It appears to affect both the quality of children's diets and the development of food preferences. However, there are many gaps in our understanding of food neophobia, especially its effects outside of laboratory contexts, and particularly its contribution to the everyday food preferences of pre-

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school children. Characteristics (eg, age, sex) of food-neophobic children are also not well understood. The purposes of the study were therefore to add to the growing literature on food neophobia by confirming and extending some of the results obtained in experimental studies and population intake studies to children's everyday food preferences, and to examine the characteristics of children associated with food neophobia.

Laboratory studies have shown that humans who are food neophobic avoid, and expect to dislike, novel food, more so than neophilic individuals.¹⁶ Whether or not food-neophobic individuals actually dislike food after they have tasted it is currently a contentious issue. Some have found that food-neophobic individuals were no more likely than neophilic individuals to dislike novel food after tasting it.¹⁵ Others, however, did note differences between neophobic and neophilic individuals in liking after tasting.¹⁷

Until now the effects of food neophobia on children's food preferences outside of the laboratory environment have received little attention. The negative effects of food neophobia on children's everyday food intakes are becoming well documented,¹⁸⁻²⁰ and strategies are needed to address this problem. Children's food preferences predict their intakes,²¹⁻²⁴ and it is likely that the effects of food neophobia on children's food intakes are at least partly caused by the effects of food neophobia on children's preferences. If this is indeed the case, then efforts to improve food neophobic children's food intakes may benefit from targeting preferences. However, data are needed to support or refute this notion. The authors were aware of only one other population-based study on relationships between food neophobia and children's food preferences.²⁵ That study investigated the predictors of food preferences for 90 food types in 70 parent-child dyads. The results showed that in 8-year-old children, higher levels of food neophobia were associated with having tasted fewer food items, disliking more food types, and liking fewer food items. This study suggested that the trait of food neophobia did indeed affect children's food preferences (liking after tasting). However, this study was based on a relatively small set of food types and was limited in its purpose and design. For instance, it is still unknown whether food neophobia affects other aspects of children's food preferences, such as liking for each of the food groups (eg, cereals, fruit, dairy, vegetables, meats) or how varied children's food preferences are. The present study sought to fill this gap in the literature.

It is also not clear whether food neophobia also affects children's food preferences differentially across various food types or food groups. Intake studies suggest that the neophobic effect may be greater for some food types and less for others. That is, higher levels of food neophobia have been associated with lower intakes of fruit, meat products, and especially vegetables,^{19,26-30} but higher intakes of saturated fat.¹⁸ It is possible that the effects of food neophobia may be stronger on those food items that may contain toxins or microbial activity or produce allergic reactions (eg, meat, vegetables),¹⁶ reflecting the intake data cited above. Indeed,

Pliner and Pelchat have shown that adults are more neophobic toward food of animal origin.³¹ However, Pliner also noted that although parents were more neophobic toward food of animal origin, their children were not.³² By conducting a population study of children's everyday food preferences with a large number of food items, the effects of food neophobia on the consumption of different food groups can be compared, thus clarifying this situation.

The other aspect of food neophobia that requires further exploration is the characteristics of food-neophobic children. The available data are fragmented and do not provide a clear picture. First, there may be age effects. Food neophobia is thought to increase from infancy,³³ although from age 2 onward there have been several contradictory findings.³⁴⁻³⁸ Second, sex differences may exist. For example, in one study boys showed a greater food-neophobic response than girls,³⁹ but no sex differences were observed in others.^{19,37} Third, there is some evidence that suggests that breast-fed infants more readily accept novel food than formula-fed infants,⁴⁰ suggesting lower levels of food neophobia. However, duration of breast-feeding may not be associated with food neophobia.²⁷ Therefore, although some children may be expected to have higher levels of food neophobia and associated food preferences than others, the influence of children's characteristics is tenuous owing to a paucity of data. As such, the second aim of this study was to examine associations between food neophobia and individual characteristics of preschool children.

In summary, although laboratory studies have suggested that food neophobia may affect children's food preferences, this relationship has not yet been established in naturalistic settings. A population-based food preference study enables the examination of large samples with a wide variety of food items, which are likely to resemble the food children may typically encounter and that may affect diets. Moreover, in everyday life the perceived dangerousness of food types may be greater than that of the safety of the laboratory, so the effects of food neophobia may be greater. This limitation provided the impetus for the present population-based study. It had 2 main aims: first, to examine whether (a) food neophobia affects children's everyday food preferences, and (b) whether it affects preferences for some food types more than others; and second, to examine whether characteristics of the child, such as his or her age, sex, and history of breast-feeding influence food neophobia. It was predicted that food neophobia would predict children's food preferences, especially reduced liking for vegetables, fruit, and meat products. It was further hypothesized that boys would be more neophobic than girls, that food neophobia would be lower in breast-fed children, and that food neophobia would be affected by the child's age.

METHODS

Recruitment

The sampling frame for this study consisted of parents of 2- to 5-year-old children. Child care centers, kindergartens,

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