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Parent-child mealtime interactions associated with toddlers' refusals of novel and familiar foods

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ABSTRACT

Parents' feeding practices have been associated with children's dietary quality and food acceptance, but previous studies have largely relied exclusively on questionnaires to assess both parent and child behavior. The current study explored the relationships between parents' reported and observed feeding practices and toddlers' food refusals.

Sixty families with toddlers (12–36 months-old) video recorded their children's dinners at home as well as a separate meal in which they offered the child a novel fruit or vegetable. Parents completed questionnaires about their feeding practices and children's picky eating and food neophobia. Videos were coded for parents' observed feeding practices at mealtimes and children's food refusals. Parents' feeding practices and children's food refusals were compared in families with children reported to be more picky and less picky eaters. The relationships between reported and observed feeding practices with observed food refusals were also assessed. It was hypothesized that parents' use of controlling and coercive prompts to eat would be associated with children's food refusals.

Parent-reported picky eating was not associated with an increase in children's total food refusals, although reported neophobia was associated with more uses of crying, pushing food away, or verbally refusing a new food. More prompts to eat of any kind were associated with more food refusals. In regression models, more observed coercive-controlling prompts used by parents were associated with more food refusals by children. Parents of pickier eaters tended to use a lower proportion of autonomy-supportive prompts to eat, and these families also showed a stronger association between the use of controlling prompts and food refusals. These families may benefit the most from interventions aiming to reduce the use of controlling practices. Models using observed feeding practices were more strongly associated with children's food refusals than were parents' reported feeding practices. This highlights the importance of behavioral observation in this field.

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1. Introduction

Many parents report that their young children are picky eaters [6,32,43]. Although there's no formal definition of picky eating [13,43], it is generally described as the rejection of foods, which could include both new foods (*neophobia*) or familiar ones, and many definitions include an element of a limited dietary variety. Generally, it is believed that food neophobia and picky eating peak in early childhood, around ages 2–6, and decline with age [7,13]. Although many children go through a picky eating phase, neophobia or pickiness can make it challenging for parents of toddlers to introduce new foods into a child's diet.

Picky eating or food fussiness are typically assessed through questionnaires, relying on the parents' assessment of the child's behavior, which may nor may not reflect children's actual behavior or diet [31].

Depending on the types of questions or analyses used (from single questions (e.g., [8]) to complex latent profiling approaches [12,44]) or the cutoff points selected to identify children as belonging in the picky group [7,18,20], results can lead to substantially different categorizations of children. Some studies are starting to move towards more objective ways of discussing picky eating, such as by focusing on more concrete behaviors, like food refusals, as an outcome, rather than the imprecisely defined "picky eating" [30]. To date, there are very few studies that have explored picky eating through observing child behaviors, such as the acceptance or intake of foods [5,52]. One such behavioral observation study [5] found that 2–4 year-old picky eaters were more likely to be disappointed with the food served, inspect the food, request a different food, or be unwilling to try a food item than were non-picky eaters served the same meals. It is important to note, however, that in that study, the parents both identified their children as picky eaters and evaluated the children's mealtime behavior, thus it is possible that some parents were more likely to perceive behaviors as reflecting

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pickiness, especially for behaviors that require subjective judgment (e.g., if the child looks disappointed). Objective evaluation in observational studies is therefore necessary to identify if these behaviors are more likely to occur in picky eating children or as a result of parent perception.

Picky eating can be influenced by environmental factors [42], such as parents' feeding practices or the home food environment [22]. Feeding practices are specific behaviors that parents use to influence what, when, or how much a child eats, such as modeling eating a food, or restricting a child's intake, and many practices have been shown to be associated with children's weight status, diet, and food acceptance [3, 4,41]. Although much of the existing literature on feeding practices and picky eating is based on questionnaire measures (e.g., [29,37,49]), a few studies have explored the associations between feeding practices and food acceptance either through behavioral observation [15,36] or through experimental methods (e.g., [10,16,19,25]). These studies have found that practices such as using pressure to eat [19] or other foods as rewards [15] can decrease children's food acceptance, whereas modeling [1,15,23] or using non-food rewards [10,25] can improve children's willingness to try a food and intake.

Although much of the existing literature on feeding practices relies on parent report, these do not necessarily correspond to observed feeding practices (for a review, see: [2]). Therefore, in the current study, food fussiness was measured both through a questionnaire and through behavioral observation. Observations of parent feeding practices and children's food refusals were conducted in two situations: at a typical dinner at home at which the children ate familiar foods, and at a separate meal at which parents were asked to introduce a new fruit or vegetable. We aimed to explore whether different types of prompts to eat and other feeding practices were used differentially by parents of picky and non-picky eaters, and which practices were most strongly associated with children's observed food refusals. We also compared whether reported or observed feeding practices better predicted children's food refusals.

The current study allowed us to directly observe the feeding practices used by parents at mealtimes as well as the children's eating behaviors, giving us a more in-depth look at how parents act in specific situations and how the children react to various parenting techniques. Based on the existing literature on feeding practices, we hypothesized that more controlling feeding practices would be associated with more observed food refusals. We also expected that parents' observed behaviors would be more strongly associated with children's food refusals than would responses on a feeding practice questionnaire.

2. Methods

2.1. Participants

Seventy-five participants were recruited for this study through a recruitment agency, using a database of families with children. Of these, 60 had complete questionnaire data and coded videos and were included for analysis. All families who were recruited lived in the United States, had at least one toddler between the ages of 12–36 months, had one legal guardian over the age of 21 who was a stay-at-home caregiver for the child, had an annual household income over \$30,000, and spoke only English in the home. Participant characteristics are presented in Table 1. The children had a mean age of 24.7 months. The stay-at-home parents who completed the questionnaires were predominantly mothers, but two were fathers. Families were explained the research procedure by phone and received and signed informed consent forms electronically. This protocol and the associated consent forms were approved by the Copernicus Group IRB (NES1-12-166).

2.2. Procedure

Two digital video cameras were sent to each family and they were instructed to video record each of their toddler's eating and drinking

Table 1
Participant characteristics.

Number of families	60
Mothers	58
Fathers	2
Mean child age in months (SD)	24.7 (6.8)
Child sex	
Female	29
Male	31
Race	
African American	3
Caucasian	49
Multiracial/other	7
Native American	1
Maternal education	
High school or trade school	4
Some college	16
College grad	27
Some post-grad or more	13
Household income	
\$30,000–49,999	19
\$50,000–79,999	24
\$80,000–99,999	7
\$100,000 or more	10
Average number of children in the family	2

occasions over the course of two full days (Monday and Thursday). Families uploaded the videos to a password-protected server at the end of the day. After the practice day of recording (Monday), the videos were reviewed by the research staff and families were given feedback about how to reposition the cameras to improve video or sound quality for optimal recording. The behaviors from the dinner occasion on the second day (Thursday) were coded using the coding scheme described below. One day during the following week, the families were asked to record an additional meal in which they were asked to feed their child a new fruit or vegetable that he/she had never tasted before. As children varied in their previous food experience, parents were free to choose any fruit or vegetable that was new to the child (approximately half chose fruits, half vegetables). By recording both a typical dinner and an occasion when a novel food was being served, we were able to collect naturalistic and objective measures of parents' uses of prompts to eat and children's eating behavior in these two different situations, with the new food situation being hypothesized to be specifically relevant for measuring food neophobia. The following week, parents were asked to complete some questionnaires about feeding practices and children's eating behaviors. Families were compensated for their participation.

2.3. Measures

2.3.1. Feeding practices questionnaires

The items of the Caregivers Feeding Styles Questionnaire (CFSQ; [27]) were used as measures of parents' reported feeding practices. The questionnaire consists of 19 items which ask parents to indicate how often they use various parenting techniques to encourage children to eat more on a 5-point Likert scale from "never" to "always". An additional selection of items were selected from other questionnaires to mirror items on the observational coding scheme (described below) so that similar parent-reported parenting practices could be used in the analyses as those observed on the videos. Questions were extracted from the following questionnaires: Comprehensive Feeding Practices Questionnaire (CFPQ; [35]), Family Food Behavior Survey [33], Control in Parent Feeding Practices [34], and Feeding Your Child [39]. Two additional questions were developed and added to address serving additional helpings and whether the child was able to influence the portion size of his food.

2.3.2. Child's picky eating behaviors

The food fussiness subscale of the Children's Eating Behaviour Questionnaire (CEBQ; [50]) was used as a measure of picky eating. This scale

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