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## Picky Eater: What Is Normal?

When it comes to issues of feeding, few topics elicit more concern and exasperation from parents than that of "Picky eating." In response to the open-ended question, "Is there anything about your child's current eating behavior that bothers you?" 49% of mothers in a recent survey soundly declared "yes," with picky eating behaviors the clear leaders.' (Other problems mentioned included: messiness, dawdling, and difficulty chewing.)

Mothers of "picky eaters" reported that their children would eat only a limited range of foods, disliked specific foods or classes of foods (the most common being vegetables), or lacked interest in eating. The following complaints will probably sound very familiar to pediatric health professionals:

"I just don't get it. Gregory would eat just about anything when he was first weaned from breast milk to solid foods. But now, at two years of age, he will only eat a couple of different foods. I think I'll scream if I have to make one more peanut butter and jelly sandwich!"

"I've tried everything I can think of to get Jordan to try new foods-cajoling, bribery, threats- nothing has worked. We've pretty much resigned ourselves to eating the few, things that Jordan likes, or fixing him a special plate. It's easier than fighting at even meal.

"My Kira is really fussy about foods that are mixed together. She likes bread and cheese on their own, but not as a grilled cheese sandwich. I could never get her to eat a casserole-but she loves pizza! Will she ever out grow this?"

"Steffie eats a good variety of foods-but only enough to sustain a sparrow. Just one or two bites and she says she's full. I'm constantly worried that she isn't getting enough to eat."

The good news is that all of these eating habits are normal mealtime behaviors for infants and young children. Problems can arise, however, when parents fail to respond appropriately to these "teachable moments." This article will define normal picky eating behavior, offer insights into its possible origins, and give practical suggestions for parents coping with this normal developmental phase.

### Defining "Picky Eating"

In addition to articulating common parental concerns, the above examples also illustrate that when parents complain about their children's eating behavior or label them as "picky-eaters," they are not always talking about the same problem. "Picky eating" actually describes a number of separate, but related, feeding problems:

1) Neophobia-a child is unwilling to try novel foods

2) Finickiness-a child will only eat a limited range of foods, and

3) Inadequate appetite-the impression of parents that their child fails to eat sufficient quantities of food for adequate nutrition.

**Food Neophobia:** Young children, more so than adults, don't like to eat novel foods. Many parents are unaware that the initial rejection of new foods is completely normal and reflects an adaptive process common to all omnivores. The early periods of infant feeding can be particularly challenging for parents, however, because during this time all foods, except breast milk, are novel at one point or another. Infants innate preference for sweet taste means that the initial introduction of sweet-tasting fruits rarely causes acceptance problems, but infants first taste of many other foods are not greeted as favorably. Often times parents view the initial rejection of a new food as a problem or evidence of a dislike for a food, and subsequently limit their infant or young child's future exposure to the food.

Repeated exposure helps infants and young children overcome their initial rejection of new foods. In a study with two- to five-year-olds, Birch and coworkers gave young children 0, 5, 10 or 15 tastes of novel fruits over a period of about a month. At the end of the exposure, the children's preferences were related to the amount of experience that they had with the foods. The most frequently tasted foods were the most preferred. Unfortunately for parents with neophobic children, if the exposure only consisted of looking at (and smelling) the foods-but no tasting was involved-the children's preferences for the taste foods did not increase.

Several studies have shown that food neophobia appears to diminish with age. Birch found that familiarity of a food is the most salient dimension for three year-olds, whereas for four-year-olds, sweetness surpasses familiarity in importance.' Birch et al reported that 11 out of 16 two-year-olds refused to try a novel food, while 0 out of 19 five-year-olds refused. Pelchat and Pliner found similar differences between three year-olds and seven-year-olds." Otis found that a willingness to try unfamiliar foods increased with age between 17 and 50 years. Pelchat found that elderly subjects (>65 years of age) were more willing than young adult subjects (18-35 years of age) to try novel foods, though he differences may be mediated by the poor olfactory sensitivity of the aged subjects.'

It is possible that a child who is particularly hesitant to try new foods could develop a preference for a limited range of foods, especially if parents give in to the behavior. Compounding matters are the number of circumstances in our culture that tend to train children to like highly palatable, high-fat, high-sugar or high-salt foods. Many children today are eating diets limited to chicken nuggets or microwave pizza and are not exposed to fresh fruits, vegetables and whole grains, which limits their opportunity to learn to like a diet rich in variety.

**Finicky Eating:** Infants and young children who are not given opportunities to overcome their fear of new foods through repeated exposure may become finicky eaters, preferring to eat only a limited range of foods. Another possibility that has been investigated is that children may become finicky eaters because they have developed conditioned taste aversions, which result from the pairing of particular food with a negative experience typically an illness. Conditioned taste aversions are fairly common (ranging from 33-65% of people)") and appear to be more likely to form in the presence of nausea and vomiting. "Safe, positive experiences with the offending foods can go a long way to extinguish taste aversions." A correlation between young children's picky eating habits and gastrointestinal upset during infancy has been identified. How the two may be related is still in question because young infants eat a limited diet and therefore have only a few foods for which conditioned aversions could develop. The children's later picky eating behavior may be the result of hyper-vigilant parents who are preoccupied with feeding problems.

Social experience is the predominant influencer of food acceptance or rejection patterns. Escalona found that infants' preferences for orange or tomato juice coincided with those of their adult feeders." Duncker and Marinho found that when a child is exposed to a peer who prefers a food not preferred by the child, the child's preference could be reversed to match that of the peer model's after repeated exposures. These reversals were found to endure up to five weeks in absence of the original social influence. More recently, Birch found that preschoolers preferences for a vegetable could be positively altered by repeatedly exposing them in lunchtime settings to preschool peers who preferred the vegetable. The impact of social experience on food preferences may help explain why a child might, for example, refuse to eat macaroni-and-cheese at home, but eat it with great glee at Grandma's house. Or why foods soundly rejected throughout childhood-vegetables-become the foundation of diets for young adults who become vegetarians while away at college.

**Inadequate Intake.** Parents frequently overestimate the amount of food that their young children need to

eat. If children are allowed to listen to their internal hunger and satiety cues, they can and do regulate their energy intake. In her classic research, Davis" " demonstrated that infants and young children will self-select a healthy diet if permitted to choose from an array of nutritionally appropriate foods. While there were large differences between children in what was consumed and in the patterning of meal size, all of the children in Davis' study self-regulated their intake and demonstrated healthy growth and development. The children did not always eat a variety of foods at every meal, but over the course of several weeks, the children consumed a diet rich in variety. Davis witnessed the children develop definite food preferences that change unpredictably from time to time. They also went for relatively long periods of time eating just a few foods (food jags). Importantly the children in the study were only offered nutritionally appropriate foods. Clearly the results would have been vastly different if the children had been allowed to freely select from the myriad of foods available in supermarkets today."

Davis also reported that even though the children in her study had highly unconventional, erratic and unpredictable energy intakes at individual meals, their energy intake supported normal growth and development. A recent study investigating the variability of children's intakes over 24 hour periods found similar results, confirming both Davis' observations and those frequently reported by parents. Birch et al found that while children's energy intakes at individual meals was highly variable, the total energy intake for each child was tightly regulated over a 14 hour period. In most cases, the children would adjust their energy intakes across meals, with high energy intakes at one meal being followed by low energy intakes at the next, or vice versa. Importantly, early feeding experiences can shape the extent to which a child will respond to the energy density and the size of meals consumed. Children who are taught to "clean their plate," rather than listen to their own internal hunger and satiety cues, will become reliant on these external social cues and will be less likely to appropriately regulate their energy intake.

Parents often bemoan their children's routine claims that they are "full" at dinner-but still have room for dessert. There is indeed scientific support for their claims. Rolls and colleagues" found that humans develop sensory-specific satiety during meals. Or simply put, our preference for a food declines during eating, but our preference for uneaten foods remains relatively high. Adults will eat more at a meal when a variety of palatable foods are served than when only one or a few palatable foods are served, i.e., increased variety leads to increased intake. Birch et al found that three- to five-year-old children also show sensory specific satiety, although they have yet to obtain evidence that variety satiety increases meal size in children as it does in adults.

Larnpl has found evidence for the pulsatile nature of children's growth and a connection between growth pulses and a number of behavioral changes in infants and young children, including changes in eating behavior. Infants in an on-going study were described by their mothers as experiencing episodes of "frenzy eating," which were correlated with the onset of an episodic growth spurt.

Adolescents reported feeling as though they had a "hollow leg" and simply could not get enough to eat. These spikes in energy intake and growth were typically followed by periods of relatively moderate or low energy intake and extended periods of no growth. Parents may see these changes in their children's eating habits as erratic and unconventional. The normally "picky eater" at times seems ravenous, or the normally "good" eater becomes "picky." These changes are in fact normal patterns driven by metabolic necessity.

## Family Patterns

The relationship between family member eating patterns is not totally clear. It is possible that children whose parents, siblings or peers reject a relatively large number of foods will themselves reject a large number of foods. Pliner and Pelchat found a stronger resemblance between the eating patterns of children and their siblings than between children and their mothers: children and their fathers were no more similar in their eating patterns than unrelated child-adult pairs in the study. Children were also found to dislike significantly greater proportions of foods than either their mothers or their fathers, but did not differ significantly from their siblings. These findings are consistent with the generally narrower range of foods accepted by children as a group as compared with adults. When examining the similarity in food preference between young adults and their parents, Rozin, Fallon and Mandel found strong family resemblances in food likes and dislikes." In addition, the "family resemblance" effect was greater for children and the same- (vs opposite-) sex parent.

Research into familial eating patterns may be clouded by "maturational" issues that affect the similarities between family members. That is to say, children may learn their general food patterns from their parents, but when it comes to specific food choices, children will eat more like other children than like adults. As they mature and share common mealtime experiences, children's eating patterns become more like their parents. Although it is likely that biological factors play a part in determining food preferences, it is unlikely that biology alone can account for the large variations observed between individuals and the similarities seen between family members. Social, biological and other factors are all important sources of these differences.

Given the strong influence that repeated experience has on food acceptance patterns and the common food experiences that families share, one might wonder why children within the same family often have different food preferences. These differences are not really that surprising given the myriad of features that are inherently different among siblings, including physical characteristics, personalities, temperaments, and personal talents in which they might excel. Likewise, in the case of personal food choices, everyone is an individual with his or her own preferences, aversions and eating style. In general, children are more likely to develop eating patterns like their other family members than like those of their next-door-neighbors. But culture is a major factor in food choice so, the eating pattern of a child in the U.S. will more closely resemble the pattern of other North Americans living in his or her particular region of the country than that of a child living in another part of the world.

## Parental Feeding Practices

Birch and Fisher identified at least three child-feeding patterns that are practiced by parents across cultures; they are: highly controlling, laissez-faire, and responsive parenting. In extreme cases, highly controlling parents will routinely assume total control by force-feeding their children. This practice provides little opportunity for children to learn to control meal timing, meal size, or food selection. The second pattern, laissez-faire, reflects the assumption that children "know" when, what, and how much they need to eat. Parents never force food issues, even if their child is at nutritional risk. In the third pattern, responsive parenting, parents set limits but modulate the degree of parental control in response to their child's changing capacity for self-control.

Each parental feeding style is associated with distinct child eating behavior outcomes. For example, by appropriately responding to their children's distress and demands for food, responsive parents generally provide a positive feeding environment, facilitate their children's acceptance of a variety of nutritious foods, and help their children develop self-control in feeding. On the other hand, highly controlling parents create a negative feeding environment, impede their children's development of self-regulation," and may in fact be the source of their children's picky-eating patterns. Pelchat and Pliner found a strong correlation between parental feeding behavior and children's eating problems. Mothers who made greater use of prodding, rewards, and punishments to encourage eating (contingency) had children with higher eating problem scores.

On the surface, children may find parents with a laissez-faire style of feeding the most enjoyable (that is, eating whatever and whenever they want). However, this style does not mesh with children's developmental learning at mealtime. Since children have an innate preference for sweets and are naturally neophobic, without modulated parental control during feeding to ensure repeated exposure to a variety of nutritious foods, children of laissez-faire parents would inevitably develop a diet limited to sweet-tasting, energy-dense foods. Clara Davis' work is often misquoted as support for a "wisdom of the body," that children "know" what nutrients they need and will seek out foods containing those nutrients. In fact, there are no data to support this notion. Except for a few substances, such as sodium, the evidence for "specific hungers" is weak, even in experimental animals who have been severely deprived of essential nutrients." Food cravings may be related to nutrient deficiencies, however the foods craved may not necessarily, be good sources of the deficient nutrients. In the case of pica, when the craving is for non-nutritional substances such as clay or starch, satisfying the craving can even lead to increased nutritional deficiency.

Research with three- to five-year-old children has demonstrated that children's responsiveness to energy density is influenced by parental control of child feeding. In particular, the child's regulation of energy intake was inversely related to the imposition of the authoritarian parental controls on children's eating. Moreover, the energy intake of the children in the study was inversely related to their adiposity. Parental reports of the extent to which they themselves had difficulties in controlling their own food intake were strongly related to their children's ability to respond to changes in energy density.

When the data from this study were analyzed separately for boys and girls, the relationship between the children's adiposity, child-feeding practices, and the child's responsiveness differed by sex of child. In girls, energy intake regulation was inversely related to their adiposity. Heavier girls showed less ability to regulate their intake. In boys, the same relationship was not seen. In fact, taller, heavier boys showed the clearest evidence of responsiveness to energy density. The authors of the study believe that these early differences in energy intake regulation are precursors of later individual differences, as well as sex differences in styles of intake control. In other words, the chronic dieting and dietary restraints that have become normative in young women and adolescent girls may have their beginnings in the early regulation of energy intake and in the differences in how boys and girls are parented in the feeding context.

The feeding pattern styles that Birch and Fisher identified are reminiscent of the general parenting styles identified by Baumrind, namely: authoritative (responsive), authoritarian (highly controlling), and permissive (laissez-faire)." The similarity between parental feeding styles and general parenting styles may help to explain why feeding behavior problems are often correlated with other types of behavioral problems like difficulty in toilet training and at bedtimes. Pelchat and Pliner found that children who showed greater problems with acting out, toileting, and fearfulness had higher problem feeding scores. Importantly, as is the case for any chronic parent-child behavior struggles, the attention a child receives for the undesired behavior, even if it is negative attention, may unwittingly reinforce it. Of course, it is also possible that children who are picky eaters or have other behavior challenges tend to elicit maladaptive behaviors from their parents. It is very difficult to know which way the causal arrow is pointing'

## Why Are Food Preferences Important?

Discussions of pediatric nutrition typically emphasize the importance of providing a diet high in nutritional quality but the importance of children's food preferences and eating habits are frequently overlooked. A recent study of the eating patterns of preschool children found that in addition to influencing the types of foods that children choose to consume, food preferences also influence the overall quality of children's diets. This is because children's appetites are palatability driven, that is to say, they eat what they like, and either refuse to eat or eat very little of what they don't like. Children in the study who preferred high-fat foods had higher fat intakes, consumed a large percent of their energy from high-fat foods, and had the heaviest parents. These findings underscore the importance of counseling parents to provide their young children with pleasant mealtime experiences and ample opportunity to learn to accept and enjoy a variety of nutritious foods.

## Practical Application

While children may not possess a "wisdom" about food selection, they appear to be wise regarding their caloric intake. Parents can help their children learn to accept and enjoy a variety of foods by providing healthy regularly scheduled meals from which their children are permitted to freely decide what and how much they will eat. This strategy allows children to develop preferences for a variety of healthy foods and to listen to their internal hunger and satiety cues to regulate their energy intake.

Children's normal hesitancy to try new foods often can be overcome with repeated, non-threatening exposures to novel foods. Making a "courtesy bite" of each food offered a family rule will give children the repeated exposure they need to learn to accept and enjoy new foods. However, even this simple tactic should not become an oppressive edict because the negative feelings that result could escalate the mealtime battle rather than diffusing it. The key is for parents to remain pleasant and calm while providing non-threatening opportunities to try new foods. Including children in meal planning and preparation can also make children surprisingly receptive to new foods. For extremely finicky eaters, it is a good idea for parents to serve at least one or two items they know their child enjoys at each meal, rotating among the major food groups. This will ensure the child receives adequate nutrition and has positive mealtime experiences. It also allows the parents to resist the temptation to over-play the role of "short order cook," easing some of the stress they too must surely experience at mealtimes.

All parents need to resist the temptation to use threats, rewards and pleadings to get their children to eat. These tactics only, interfere with children's development of intake regulation and, in the case of offering sweet rewards for eating less-preferred foods, reinforce the child's dislike for the less-preferred food while enhancing the child's preference for the sweet reward.

A non-threatening approach frequently used to convince children and adults to try unfamiliar foods is to provide information about the foods (e.g., "It tastes good," "It's good for you," or "It tastes like chicken."). Recent research indicates that taste information is effective for modifying a person's willingness to try novel foods, but nutritional information is less effective, probably because beneficial or medicinal substances are often thought to be bad tasting. Children's willingness to try unfamiliar foods was also found to increase with age). In contrast, information is not found to be useful for overcoming taste aversions based on nausea ("It was really the flu that made you nauseous") or food rejections based on disgust ("People in Africa eat and enjoy insects"), which are resistant to informational appeals.

Picky eating patterns can be cause for concern if a child is not eating a varied diet or is not growing and developing normally. ("Di