



Helping Children Develop Healthy Eating Habits

MAUREEN M. BLACK, PhD

KRISTEN M. HURLEY, PhD

University of Maryland School of Medicine, USA

(Published online June 11, 2003)

(Revised August 24, 2007)

Topic

Eating behaviour

Nutrition and pregnancy

Introduction

The first year of life is characterized by rapid developmental changes related to eating. As infants gain truncal control, they progress from sucking liquids in a supine or semi-reclined position to eating solid foods in a seated position. Oral motor skills progress from a basic suck-swallow mechanism with breast milk or formula to a chew-swallow mechanism with semi-solids, progressing to complex textures.^{1,2} As infants gain fine motor control, they progress from being fed exclusively by others to at least partial self-feeding. Their diet extends from breast milk or formula, through baby cereals and specially prepared foods, to the family diet. By the end of the first year of life, children can sit independently, can chew and swallow a range of textures, are learning to feed themselves, and are making the transition to the family diet and meal patterns.

Now the child is ready for variety, an essential component of a high-quality diet. Data gathered on infants and young children 6 to 23 months of age across 11 countries have demonstrated a positive association between dietary variety and nutritional status.³ In a sample of middle-class families with healthy dietary patterns, dietary variety and exposure to fruits and vegetables in infancy and toddlerhood were associated with acceptance of these foods at later ages.⁴

Children's eating patterns and food preferences are established early in life. When children refuse nutritious foods such as fruits or vegetables, mealtimes can become stressful or confrontational, and children may be denied both the nutrients they require and healthy, responsive interactions with caregivers. Caregivers who are inexperienced or stressed, and those who have poor eating habits themselves, may be most in need of assistance to facilitate healthy, nutritious mealtime behaviour with their children.

Subject

Problems associated with eating occur in 25% to 35% of all children, particularly when children are acquiring new skills and are challenged with new foods or mealtime

expectations.⁵ For example, infancy and toddlerhood are characterized by bids for autonomy and independence as children strive to do things themselves. When this is applied to eating behaviours, children may be neophobic (hesitant to try new foods) and insist on a limited repertoire of foods,⁶ leading them to be described as picky eaters.

Most eating problems are temporary and easily resolved with little or no intervention. However, eating problems that persist can undermine children's growth, development and relationships with their caregivers, leading to long-term health and developmental problems.⁷ Unfortunately, caregivers of children with persistent eating problems may not seek professional advice until the problems become severe and interfere with their growth or behaviour in other areas.

Problems

Eating patterns have developmental, family and environmental influences. As children become developmentally able to make the transition to family foods, their internal regulatory cues for hunger and satiety are often overridden by familial and cultural patterns. At the family level, children of caregivers who model unhealthy dietary behaviours are likely to establish patterns of eating behaviours and food preferences that include excess amounts of fat and sugar. At the environmental level, children's frequent exposure to fast-food and other restaurants has led to increased consumption of high-fat foods, such as French fries, rather than more nutritious options, such as fruit and vegetables.⁸ In addition, caregivers may not realize that many commercial products marketed for children, such as sweetened drinks, may satisfy hunger or thirst but provide minimal nutritional benefits.⁹

National surveys have reported excessive caloric intakes during toddlerhood,^{10, 11} and many children continue to consume alarmingly low quantities of fruit and vegetables and essential micronutrients.¹² By elementary school, many children receive over half their beverage intake from sweetened drinks,¹³ a pattern that undoubtedly begins during the toddler and preschool years. These poor nutritional patterns (high fat, sugar and refined carbohydrates; sweetened drinks; and limited fruit and vegetables) increase the likelihood of micronutrient deficiencies (e.g. Iron Deficiency Anemia) and excess weight in children.

Research Context

Eating is often studied through observational studies or caregiver reports of mealtime behaviour. Some investigators rely on clinical samples of children with growth or eating problems, while others recruit normative children.

Key Research Questions

Key questions include the progression of eating behaviours from infancy through toddlerhood, methods children use to signal hunger and satiety, and why some children (the so-called "picky" eaters) have selective food preferences. Key questions for caregivers and families are how to promote healthy eating behaviours in young children, how to encourage children to eat healthy food and how to avoid feeding problems.

Recent Research Results

Attachment and feeding

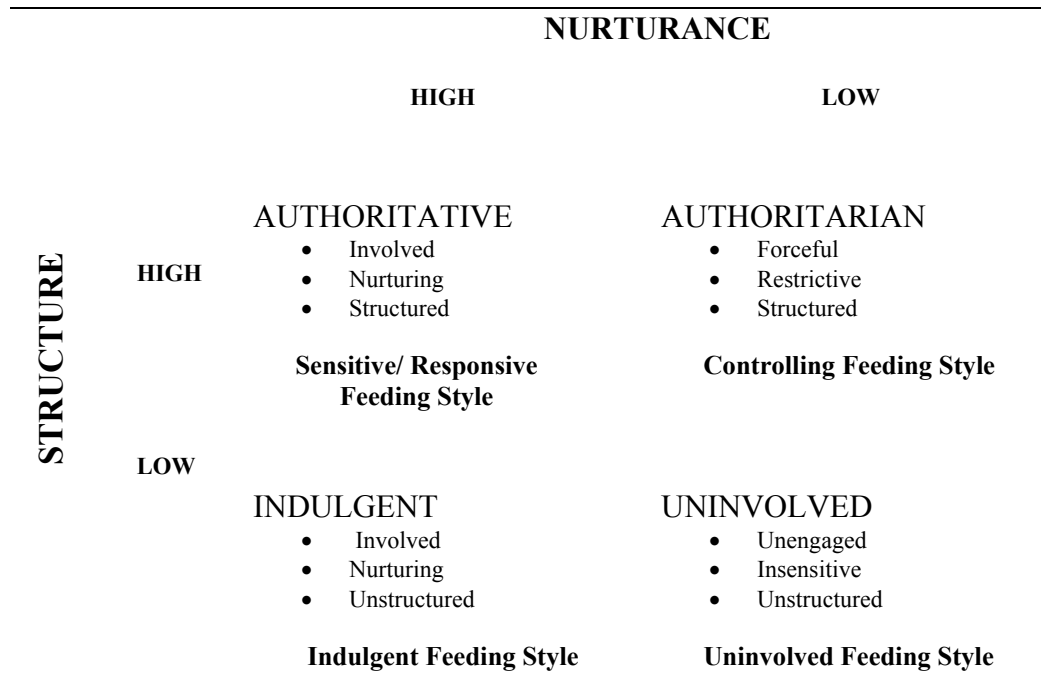
Healthy feeding behaviour begins in infancy, as infants and their caregivers establish a partnership in which they recognize and interpret both verbal and non-verbal communication signals from one another. This reciprocal process forms a basis for the emotional bonding or attachment between infants and caregivers that is essential to healthy social functioning. If there is a disruption in the communication between children and caregivers, characterized by inconsistent, non-responsive interactions, the attachment bond may not be secure, and feeding may become an occasion for unproductive, upsetting battles over food.

Infants who do not provide clear signals to their caregivers or do not respond to their caregivers' efforts to help them establish predictable routines of eating, sleeping and playing are at risk for a range of problems, including feeding problems.⁷ Infants who are premature or ill may be less responsive than healthy full-term infants and less able to communicate their feelings of hunger or satiety. Caregivers who do not recognize their infants' satiety cues may overfeed them, causing infants to associate feelings of satiety with frustration and conflict.

Feeding Styles

Feeding styles refers to the interactive pattern of behaviours between caregivers and children that occurs during feeding. As with parenting in general, feeding styles are embedded in dimensions of nurturance and structure.^{14,15} There are four feeding styles embedded within these two dimensions: sensitive/responsive, controlling, indulgent, and uninvolved (Figure 1).

Figure 1. Patterns of Parenting and Feeding Styles



A **sensitive/responsive feeding style**, high in nurturance and structure, represents caregivers who form a relationship with their child that involves clear demands and mutual interpretation of signals and bids for mealtime interaction. Responsivity on its own may or may not be sensitive (e.g. yelling at a toddler in response to food refusal), whereas sensitive responsivity refers to interactive behaviours characterized by emotional availability, contingent, developmentally appropriate and consistent responses to children’s cues, and easy give-and-take.^{16,17} The sensitive/responsive style is a derivative of the authoritative parenting style.^{14,15}

A **controlling feeding style**, high in structure and low in nurturance, represents caregivers who use forceful or restrictive strategies to control mealtimes. Controlling feeding styles are embedded in an overall authoritarian pattern of parenting and include over-stimulating behaviours, such as a mother trying to get a child’s attention by speaking loudly, forcing foods or otherwise overpowering the child.¹⁸ Observational research has shown that infants and children of over-stimulating caregivers show distress and/or avoidance.¹⁸

Among preschool children, forceful and restrictive techniques are often counter-productive – children who are pressured to eat more fruit and vegetables do not,¹⁹ and children of caregivers who use restrictive feeding practices tend to overeat.²⁰ When families are controlling, particularly around food, they may override their children’s internal regulatory cues for hunger and satiety.²¹ The innate capacity that infants have to self-regulate their energy intake declines during early childhood in response to family and

cultural patterns.²² Although the mechanisms that guide regulatory changes are not entirely clear, when caregivers override their children's regulatory processes, eating may occur in the absence of hunger, which, in turn is associated with rapid weight gain and pediatric overweight.²⁰

An **indulgent feeding style**, high in nurturance and low in structure, is embedded in an overall indulgent style of parenting, and occurs when caregivers allow children to make decisions around meals, such as when and what they will eat.²³ Without parental guidelines, children are likely to be attracted to high salt/high sugar foods, rather than to a more balanced variety including vegetables.²³ Thus, an indulgent feeding style may be problematic, given infants' genetic predispositions to prefer sweet and salty tastes.²⁴ Children of caregivers who display an indulgent feeding style have been shown to be heavier than children of caregivers who use non-indulgent feeding styles.²³

An **uninvolved feeding style**, low in both nurturance and structure, often represents caregivers who have limited knowledge and involvement in their child's mealtime behaviour.²³ Uninvolved child feeding styles may be characterized by little or no active physical help or verbalization during feeding, lack of reciprocity between the caregiver and child, a negative feeding environment and a lack of feeding structure or routine. Uninvolved feeders often ignore both child feeding recommendations and their toddler's cues of hunger and satiety and may be unaware of what or when their toddler is eating. Egeland and Sroufe²⁵ found that children of uninvolved or psychologically unavailable caregivers were more likely to be anxiously attached when compared with children of available caregivers. An uninvolved feeding style is embedded in an overall uninvolved style of parenting.²³

Costanzo and Woody²⁶ propose a domain-specific model of parenting styles, in which parental behaviour varies across situations. They propose that caregivers may be sensitive and responsive in one context or domain (e.g. during play), but not necessarily in all domains. For example, if caregivers perceive that their child has a feeding problem, they may be controlling during feeding. Our research found partial support for domain-specificity as applied to parental controlling behaviour. Although parental nurturance was consistent across feeding and play, parental control was consistently higher during feeding than during play.²⁷

Faith and colleagues²⁸ reviewed 22 studies that examined feeding styles. Most were cross-sectional^{29,2} and measured feeding styles using parent report.^{10,2} The few studies that used observational measures focused on child feeding behaviours (e.g. bites, refuses food, etc) and parent behaviours (e.g. offers food, encourages eating) in relatively small samples of children,³⁰ and did not focus on the quality of the overall relationship. The most common finding was that caregivers who were restrictive had heavy children. However, because most studies were cross-sectional, it is not clear whether caregivers reacted to their child's overweight by attempting to restrict their intake or children reacted to parental restrictions by overeating.

Little is known about feeding styles early in life when children are being socialized to the family meal. Although family environments influence children's eating behaviour,

including the kinds of foods that are offered (composition of diet, different textures and tastes), feeding styles, and modelling of appropriate and inappropriate eating behaviour,³¹ correlations between feeding styles and children's weight gain, behaviour and development have not been well studied and the data that do exist are controversial.²⁸

Food preferences

Children who are raised with caregivers who model healthy eating behaviours, such as a diet rich in fruit and vegetables, establish food preferences that include fruit and vegetables.⁴

Food preferences are also influenced by associated conditions. Children are likely to avoid food that has been associated with unpleasant physical symptoms, such as nausea or pain. They may also avoid food that has been associated with the anxiety or distress that often occurs during meals characterized by arguments and confrontations.

Children also accept or reject food based on qualities of the food, such as taste, texture, smell, temperature or appearance, as well as environmental factors, such as the setting, the presence of others and the anticipated consequences of eating or not eating. For example, consequences of eating may include relief from hunger, participation in a social function or attention from caregivers. Consequences of not eating may include additional time to play, becoming the focus of attention or getting snack food instead of the regular meal.

Increasing familiarity with the taste of a food increases the likelihood of acceptance.^{32,33} Caregivers can facilitate the introduction of new foods by pairing the new food with preferred food and presenting the new food repeatedly until it is no longer "new."

Conclusions

More research is needed to investigate the individual, interactive and environmental determinants of feeding styles and the relationships between feeding styles and children's eating behaviour and weight gain. Consistent feeding style definitions and validated tools to measure feeding styles are also needed.

Early childhood eating behaviours are heavily influenced by caregivers and are learned through early experiences with food and eating. Education and support provided by health professionals (i.e. public health nurses, family physicians and pediatricians) and nutrition programs need to be strengthened to ensure that caregivers have the facilities needed to address issues of eating behaviours during childhood.

Caregivers should eat with children so modelling can occur and mealtimes are viewed as pleasant social occasions. Eating together lets children watch caregivers try new foods and helps children and caregivers communicate hunger and satiety, as well as enjoyment of specific foods.³⁴

Caregivers control both the food that is offered and the mealtime atmosphere. Their "job" is to ensure that children are offered healthy food on a predictable schedule in a pleasant

setting.³⁴ By developing mealtime routines, caregivers help children learn to anticipate when they will eat. Children learn that feelings of hunger are soon relieved and there is no need to feel anxious or irritable. Children should not graze or eat throughout the day, so they develop an expectation and an appetite around mealtime.³⁵

Mealtimes should be pleasant and family-oriented, with family members eating together and sharing the events of the day. When mealtimes are too brief (less than 10 minutes), children may not have enough time to eat, particularly when they are acquiring self-feeding skills and may eat slowly. Alternatively, sitting for more than 20 or 30 minutes is often difficult for a child and mealtime may become aversive.

When meals are characterized by distractions from television, family arguments or competing activities, children may have difficulty focusing on eating. Caregivers should separate mealtime from playtime and avoid using toys or television to distract the child during mealtime. Child-oriented equipment, such as highchairs, bibs and small utensils, may facilitate eating and enable children to acquire the skills of self-feeding.

Implications

Implications can be directed to environmental, family and individual levels. At the environmental level, encouraging fast-food and other restaurants to provide healthy, palatable food options that are appealing to young children may reduce some of the feeding problems that occur when children are repeatedly exposed to high-fat foods, such as French fries, rather than to nutritious options, such as fruit and vegetables. At the family level, guidelines for children's nutrition should include information on their nutritional needs and on strategies to promote healthy eating behaviour, including recognizing children's signals of hunger and satiety and use of appropriate feeding styles, allocating time for meals, scheduling meals at relatively consistent times, promoting new foods through modelling and avoiding stress and conflict during meals. At the individual level, programs that help children develop healthy eating patterns by eating nutritious foods and eating to satisfy hunger, rather than to satisfy emotional needs, may prevent subsequent health and developmental problems.³⁵

REFERENCES

1. Bosma J. Development and impairments of feeding in infancy and childhood. In: Groher ME, ed. *Dysphagia: Diagnosis and management*. 3rd ed. Boston, MA: Butterworth-Heinemann; 1997:131-138.
2. Morris SE. Development of oral motor skills in the neurologically impaired child receiving non-oral feedings *Dysphagia* 1989;3:135-154.
3. Arimond M, Ruel MT. Dietary diversity is associated with child nutritional status: Evidence from 11 demographic and health surveys. *The Journal of Nutrition* 2004;134:2579-2585.
4. Skinner JD, Carruth BR, Bounds W, Ziegler P, Reidy K. Do food-related experiences in the first 2 years of life predict dietary variety in school-aged children? *Journal of Nutrition Education and Behavior* 2002;34(6):310-315.
5. Linscheid TR, Budd KS, Rasnake LK. Pediatric feeding disorders. In: Roberts MC, ed. *Handbook of pediatric psychology*. 2nd ed. New York, NY: Guilford Press; 1995:501-515.
6. Birch LL, McPhee L, Shoba BC, Pirok E, Steinberg L. What kind of exposure reduces children's food neophobia? Looking vs tasting. *Appetite* 1987;9(3):171-178.
7. Keren M, Feldman R, Tyano S. Diagnoses and interactive patterns of infants referred to a community-based infant mental health clinic. *Journal of the American Academy of Child & Adolescent Psychiatry* 2001;40(1):27-35.
8. Zoumas-Morse C, Rock CL, Sobo EJ, Neuhaus ML. Children's patterns of macronutrient intake and associations with restaurant and home eating. *Journal of the American Dietetic Association* 2001;101(8):923-925.
9. Smith MM, Lifshitz F. Excess fruit juice consumption as a contributing factor in nonorganic failure to thrive. *Pediatrics* 1994;93(3):438-443.
10. Ponza M, Devaney B, Ziegler P, Reidy K, Squatrito C. Nutrient intakes and food choices of infants and toddlers participating in WIC. *Journal of the American Dietetic Association* 2004;104(1 Suppl 1):71-79.
11. Devaney B, Kalb L, Briefel R, Zavitsky-Novak T, Clusen N, Ziegler P. Feeding infants and toddlers study: overview of the study design. *Journal of the American Dietetic Association* 2004;104(1 Suppl 1):8-13.
12. Picciano MF, Smiciklas-Wright H, Birch LL, Mitchell DC, Murray-Kolb L, McConahy KL. Nutritional guidance is needed during dietary transition in early childhood. *Pediatrics* 2000;106(1):109-114.
13. Cullen KW, Ash DM, Warneke C, de Moor C. Intake of soft drinks, fruit-flavored beverages, and fruits and vegetables by children in grades 4 through 6. *American Journal of Public Health* 2002;92(9):1475-1477.
14. Baumrind D. Rearing competent children In: Damon W, ed. *Child development today and tomorrow*. San-Francisco, CA: Jossey-Bass Publishers; 1989:349-378.
15. Maccoby EE, Martin J. Socialization in the context of the family: parent-child interaction. In: Hetherington EM, ed. *Handbook of child psychology: Socialization, personality, and social development*. Vol 4. New York, NY: John Wiley; 1983:1-101.

16. Leyendecker B, Lamb ME, Scholmerich A, Fricke DM. Context as moderators of observed interactions: A study of Costa Rican mothers and infants from differing socioeconomic backgrounds. *International Journal of Behavioural Development* 1997;21(1):15-24.
17. Kivijarvi M, Voeten MJM, Niemela P, Raiha H, Lertola K, Piha J. Maternal sensitivity behaviour and infant behaviour in early interaction. *Infant Mental Health Journal* 2001;22(6):627-640.
18. Beebe B, Lachman F. *Infant research and adult treatment: Co-constructing interactions*. Hillsdale, NJ: The Analytic Press; 2002.
19. Fisher JO, Mitchell DC, Smiciklas-Wright H, Birch LL. Parental influences on young girls' fruit and vegetable, micronutrient, and fat intakes. *Journal of the American Dietetic Association* 2002;102(1):58-64.
20. Birch LL, Fisher JO, Davison KK. Learning to overeat: maternal use of restrictive feeding practices promotes girls' eating in the absence of hunger. *American Journal of Clinical Nutrition* 2003;78(2):215-220.
21. Birch LL, Fisher JO. Mothers' child-feeding practices influence daughters' eating and weight. *American Journal of Clinical Nutrition* 2000;71(5):1054-1061.
22. Birch LL, Johnson SL, Andresen G, Peters JC, Schulte MC. The variability of young children's energy intake. *New England Journal of Medicine* 1991;324(4):232-235.
23. Hughes SO, Power TG, Fisher JO, Mueller S, Nicklas TA. Revisiting a neglected construct: Parenting styles in a child-feeding context. *Appetite* 2005;44(1):83-92.
24. Birch LL. Development of food preferences. *Annual Review of Nutrition* 1999;19:41-62.
25. Egeland B, Sroufe LA. Attachment and early maltreatment. *Child Development* 1981;52(1):44-52.
26. Costanzo PR, Woody EZ. Domain-Specific parenting styles and their impact on the child's development of particular deviance: The example of obesity proneness. *Journal of Social and Clinical Psychology* 1985;3(4):425-445.
27. Black MM, Hutcheson JJ, Dubowitz H, Starr RH, Berenson-Howard J. The roots of competence: Mother-child interaction among low-income, urban, African American families. *Journal of Applied Developmental Psychology* 1996;17(3):367-391.
28. Faith MS, Scanlon KS, Birch LL, Francis LA, Sherry B. Parent-child feeding strategies and their relationships to child eating and weight status. *Obesity Research* 2004;12(11):1711-1722.
29. Jeffrey RW. Public health strategies for obesity treatment and prevention. *American Journal of Health Behaviour* 2001;25(3):252-259.
30. Klesges RC, Woolfrey J, Vollmer J. An evaluation of the reliability of time sampling versus continuous observation data collection. *Journal of Behavior Therapy and Experimental Psychiatry* 1985;16(4):303-307.
31. Black MM, Bentley ME, Le K, McNary SW. Delaying Second Births among Adolescent Mothers: A Randomized Controlled Trial of Home-Based Intervention. Paper presented at: Pediatric Academic Societies annual meeting, May, 2003. Seattle, WA.

32. Birch LL. Children's preferences for high-fat foods. *Nutrition Reviews* 1992;50(9):249-255.
33. Birch LL, Marlin DW. I don't like it; I never tried it: effects of exposure on two-year old children's food preferences. *Appetite* 1982;3(4):353-360.
34. Satter E. *Child of mine: Feeding with love and good sense*. Palo Alto, CA: Bull Publishing; 2000.
35. Black MM, Cureton LA, Berenson-Howard J. Behaviour problems in feeding: Individual, family, and cultural influences. In: Kessler DB, Dawson P, eds. *Failure to thrive and pediatric undernutrition: A transdisciplinary approach*. Baltimore, Md: Paul H. Brookes Publishing Co.; 1999:151-169.

To cite this document:

Black MM, Hurley KM. Helping children develop healthy eating habits. Rev. ed. In: Tremblay RE, Barr RG, Peters RDeV, Boivin M, eds. *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development; 2007:1-10. Available at: http://www.child-encyclopedia.com/documents/Black-HurleyANGxp_rev-Nutrition.pdf. Accessed [insert date].

Copyright © 2003-2007