CHAPTER 14
Food Cognition and Nutrition Knowledge

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Understanding food and nutrition is a critical problem of development. A few common taste preferences—specifically proclivities for sweet, salty, and familiar flavors—are evident early in development, and likely emerged to promote growth and guide humans toward substances that are safe to eat (see also Chapter 2). However, these common taste preferences do not fully account for the complexity of the human diet. As generalist animals, humans eat many different kinds of foods, including ones that are initially unfamiliar. Additionally, in the modern food environment, which is replete with calorie-dense foods and misleading nonnutritive sweeteners, favoring sweet and salty foods does not lead to a healthy diet. Thus the youngest members of our species face a difficult task as they learn to eat a diet that meets (and does not exceed) their nutritional needs.

Young children face an additional challenge when selecting foods: Food choices vary widely across cultures. Although young infants across the globe may share some early taste predilections, flavor preferences and cultural mores surrounding food selection become highly diversified across cultural contexts. Thus as a social species, children must learn about more than just the palatability of different substances. They must also learn who eats what foods when, where, and in what contexts, absorbing cultural traditions surrounding food selection and preparation that put them in step with the practices of their community. For example, some religious traditions prohibit practitioners from eating pork, but permit eating beef, whereas others prohibit beef, but permit pork; the same foods are judged very differently depending on one’s cultural background. The development of food cognition therefore depends not only on children’s own trial-and-error experiences with different tastes and foods but also on watching other people eat and learning from what other people tell children about food. Evidence of these social and testimonial influences on early food selection provides the focus of the current chapter.

In this chapter, we provide an overview of children’s early food cognition (i.e., their ability to categorize foods, learn information about foods, and reason about the properties of foods) and behavior in the food domain. Specifically, we focus on the important role
that other people play in guiding children’s concepts, preferences, and choices. An additional goal of the chapter is to highlight the role that carefully controlled laboratory studies investigating social influences on food selection can play in the quest to explain—and ultimately improve—children’s eating. We begin by reviewing literature on children’s early thinking about food, including the protracted development of disgust and rejection in the food domain. We then highlight evidence demonstrating that young children solve the challenge of food selection, in part, by watching what other people eat and listening to what other people say (referred to as “testimony” in the field of cognitive development research). This testimony can range from simple statements of preferences (e.g., “I like this food” or “all the kids think this is a cool food to eat”) to detailed lessons explaining the underlying mechanisms of digestion and nutrition. To preview, studies suggest that, in addition to providing children with information that can influence children’s choices, learning about other children’s preferences can actually influence children’s perceptual experience: Foods that other people like taste better to them. We conclude by suggesting opportunities for developmental psychologists and public health professionals to collaborate in efforts to understand children’s thinking in the food domain and develop initiatives to improve children’s health.

EARLY FOOD COGNITION: HOW DO INFANTS AND CHILDREN CATEGORIZE FOODS?

Food categorization can take several forms: Deciding whether a substance is food or not; judging whether a particular food is a fruit or a vegetable; determining whether a substance is healthy or unhealthy, sweet or not sweet, tasty or not tasty, socially acceptable to eat or taboo, disgusting or not disgusting, and so on. The ability to categorize substances allows individuals to build rich and generalizable conceptual knowledge in the food domain (and beyond). For instance, understanding that apples, in general, are edible allows children to extend that knowledge to new apples they encounter (even if those apples vary slightly in size or shape), rather than learning the properties of each new apple they encounter. The myriad ways in which foods can be categorized highlight the scope of the learning problem that faces young humans as they come to understand the food rules of their community.

Studies of infants and toddlers reveal striking limitations in very young children’s ability to appropriately categorize and select foods for themselves. For example, adults, including both human adults and adult rhesus monkeys, know that color and texture are the most relevant properties for identifying foods, but young infants do not. In one study, 8-month-old infants treated a change in a food’s color and texture (e.g., green juice changing to orange sugar) as equivalent to a change in the appearance of a container that held the food (e.g., green juice in a bowl changing to green juice in glass). In contrast, adults recognize that a change in color and texture usually signifies a change in food type, whereas a change in container shape does not. In the absence of knowing which
properties are relevant for classifying foods, it would be difficult to select foods for oneself. Supporting this suggestion, infants and toddlers are willing to put things in their mouths that adults consider to be dangerous or disgusting. For example, when presented with fake dog feces (made from limburger cheese and peanut butter), over half of 16- to 29-month-olds in one study were willing to eat the substance. Toddlers’ difficulty in determining what they should and should not eat is underscored by evidence that children under the age of 2 are more likely than any other age group to need treatment for accidentally poisoning themselves.

Following infancy and toddlerhood, children’s food categorization abilities begin to improve and continue improving across the preschool years. Unlike their younger counterparts, preschool-age children recognize that color and texture are relevant for classifying foods and very few are willing to put disgusting items, such as the fake dog feces described previously, in their mouth. Additional research reveals that preschool-age children are able to determine whether a wide range of entities are edible vs. nonedible and can even classify different kinds of foods. In one study, 3- and 4-year-old children were presented with images of foods (e.g., lemon, apple, cauliflower) and nonfoods (e.g., light bulb, dog toy) and were asked whether each item was edible or not. Children correctly indicated that edible foods were in fact edible. However, they did have a high rate of false alarms for nonfoods, classifying 50% of nonfoods as edible. Age was negatively correlated with children’s false alarm rate, suggesting that the ability to discriminate edible from inedible substances improves over this two-year age range. In another study, 2- to 6-year-old children were shown pictures of fruits and vegetables and were simply asked to sort the pictures into a fruit box and a vegetable box. Even the youngest children in the study could accurately categorize the pictures as fruits or vegetables, though children’s performance improved with age. Taken together, these findings highlight substantial improvement in children’s food categorization abilities into and across the preschool years (Box 14.1).

DEVELOPING FOOD COGNITION: CATEGORIZATION AND REJECTION

Are children’s categorization abilities related to their food acceptance and rejection behavior? On the one hand, one could reason that children who are better at categorizing foods should demonstrate high rates of rejection and pickiness. If children can accurately identify what different substances are, they can selectively reject some and accept others. From this perspective, accepting familiar foods and rejecting unfamiliar foods could be

**BOX 14.1**
- Infants and toddlers initially show limited categorization abilities in the food domain.
- Children’s ability to categorize foods improves during early childhood.
considered an achievement of development. Indeed, some have hypothesized that neophobias could be seen as a “smart” behavior, as only eating foods that one has eaten before without incident reduces the likelihood of poisoning oneself. On the other hand, one could reason that children who are worse at categorizing foods should demonstrate high rates of rejection and pickiness. First, limited categorization abilities could lead to a generalization problem: If children are not sure what something is (e.g., food or nonfood, dessert or vegetable), children may reject foods more than is necessary. Second, if children tend to reject foods, then children’s pickiness may discourage parents from exposing children to those foods, and consequently those children may have fewer opportunities to learn about food categories and properties. The limited literature on the association between food rejection and categorization is mixed. Some evidence suggests an association between rejection and food categorization abilities, whereas other data do not. These mixed findings suggest an area where more research is needed. Studies in which researchers teach new classification skills and then measure children’s consumption would be particularly illuminating, as such research would allow for causal inferences.

Children’s rejection of foods based on their perception of disgust changes over the course of childhood. As noted previously, one study showed that children younger than 30 months of age were willing to put dangerous or disgusting substances in their mouths, whereas children at 30 months and older largely rejected these substances. Not only does this evidence reveal early limits in young children’s food categorization abilities, but it also provides initial evidence that learning to reject disgusting items has a protracted developmental timeline. Disgust is often thought to have evolved because of the importance of pathogen avoidance—the canonical disgust face uses similar movements to spitting out food (to expel toxic items that one has accidentally ingested) and disgust is often felt in response to rotten foods or bodily products (to prevent ingestion or contact in the first place). Nonetheless, studies of disgust reveal limitations and substantial development in this domain. In a recent study examining children’s disgust reactions across a wide range of ages, 2- to 10-year-old children were shown examples of several different types of disgust elicitors, including “core” elicitors, which are thought to be especially threatening to one’s health (e.g., odors that resemble human excrement, such as organic fertilizer and fermented shrimp paste), animal elicitors (e.g., maggots, touching a glass eye), and sociomoral elicitors (e.g., stealing from a person with a disability, the marriage between a man and a much older woman). Children’s reactions to each item (e.g., whether they were willing to touch the item or endorse the behavior) and their facial expressions (i.e., did they produce a disgust face or not) were measured. Children began to demonstrate some avoidance of the core disgust elicitors (i.e., those related to bodily fluids and rotten foods) around 2.5 years of age, followed by animal products at around 4.5 years of age, and then sociomoral elicitors at around 7 years of age. In addition, parents of younger children in this study were more likely than parents of older children...
to demonstrate disgust to these items (as evidenced by their facial expressions), suggesting that part of the disgust learning process may involve observing the reactions of social partners. Taken together, these results indicate disgust is slow to develop, despite its relevance for human health, and highlight the potential for social learning to influence this development (Box 14.2).

**SOCIOCOGNITIVE LEARNING ABOUT FOOD: OBSERVING OTHER PEOPLE**

Food cognition does not happen in social isolation; rather, it is informed by social contexts. Although infants and toddlers do not possess all the skills they need to select an appropriate diet on their own, they also do not need to do so. Until they are weaned, children receive food exclusively from their caregivers. Even after weaning, most of the food that is available to children is provided by caregivers—and most caregivers know which substances are poisonous, which foods comprise a culturally appropriate diet, and which foods taste good. Further, a long tradition of research shows that, beginning in infancy, children are highly attuned to the behaviors and emotions of other people, allowing children to capitalize on other people’s knowledge and behavior in the food domain.

Recent research has revealed insights into how infants’ food cognition and selection is affected by the choices of people around them. First, despite infants’ ostensibly limited cognitive abilities in the food domain, infants appear to be much more sophisticated thinkers when information about food is embedded in a social context. Recent research shows that infants as young as 9 months of age see common food choice as indicative of a social relationship. In one study, when 9-month-old infants saw two people eat and enjoy the same food (rather than disagreeing about the food’s taste), infants expected those people to subsequently have a positive social interaction (e.g., smiling and waving at each other) rather than a negative one (e.g., crossing their arms and looking angrily away from one another). It is notable that infants’ preliminary expectations accord with those of adults: Adults infer that people who share foods have more intimate social relationships and behave more cooperatively with other people after sharing foods.

**BOX 14.2**

- Research is needed to understand how children’s abilities to categorize foods influence their food rejection behaviors.
- Children’s rejection of foods based on their perception of disgust develops slowly and appears to begin during the third year of life.

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Infants also interpret food choice as being embedded within social or cultural groups. In another study, 35 14-month-old infants generalized one person’s food preference to another. For instance, if infants saw one person liking food A over B, they expected a second person to have the same preference. Yet, when the two featured people had a negative social interaction, or when they spoke in two different languages (suggesting they are members of different cultural groups), infants stopped generalizing one person’s preference to another: They were no longer surprised when the two people had different preferences. From these results, it seems as though infants readily learn about the sociality of food selection early in life.

In the studies described previously, infants were merely watching other people eat, and their visual responses to those events (i.e., the amount of time infants spent looking at each video) were measured. Infants and children also successfully attend to the actions of others to learn about what to eat themselves. For instance, in one study, 36 18-month-old infants watched videos of a person who picked fruit from a plant and put that fruit in their mouth. When asked, “Which one can you eat?,” infants were more likely to select the fruit they saw the person put in their mouth, compared to a different fruit. This effect was not observed when the adult put the food behind his ear, suggesting that infants are specifically monitoring other people’s eating actions. In a second experiment, infants watched an actor pick a fruit from a plant or from a plastic grid and put the fruit in his mouth. Infants were more likely to select the fruit when they saw it picked from the plant compared to the plastic grid, suggesting further specificity in infants’ social attention to other people’s food choices. In another study, 39 12-month-old infants saw videos of different people eating different foods and speaking in different languages (English vs. French). Infants were more likely to choose the food they saw being eaten by the English speaker (the language spoken in infants’ homes) than the food eaten by the French speaker, even though both speakers demonstrably enjoyed eating their food.

In addition to learning about what they might want to eat themselves, young children can also select foods for other people. In a now-classic study, 40 14- and 18-month-old children watched an adult eat foods and react with either disgust or happiness. Some children in each age group saw the adult react positively toward goldfish crackers and negatively toward broccoli (matching most toddlers’ preferences) and other children in each age group saw the adult react positively toward broccoli and negatively toward goldfish crackers (the opposite of most toddlers’ preferences). Then, the adult asked the child to hand her one of the two foods. Among children who did give the adult one of the foods, 14-month-old children tended to hand the adult a goldfish cracker, matching their own preferences. In contrast, 18-month-olds were more likely to give the adult the food she has previously reacted to with happiness (rather than disgust), even if the adult’s preference disagreed with their own. Taken together, these studies show that watching other people’s food choices influences very young children’s behavior, both when choosing foods for themselves and when selecting foods for other people (Box 14.3).
Powerful effects of social modeling are also evident beyond infancy and toddlerhood. Across the lifespan, people tend to choose food that they observe their peers eating and eat more when receiving positive social attention or when eating with other people. In addition to learning from what they observe other people doing directly (as is the focus of many studies that examine the impact of social modeling on children’s food intake; see Chapter 4), children learn from what other people tell them (i.e., from their testimony). Learning from others’ testimony is a critical knowledge-building tool because much of what children need to know about the world—ranging from history to biological principles to religious tenets—cannot be observed directly. Learning from testimony is also efficient. If one person reports that a food does not taste good or is spoiled, then other people can avoid that food without having to experience it themselves.

As is true of other content areas (e.g., learning the names of objects), young children trust other people’s testimony in the domain of food. For example, in one such study, 3- to 6-year-old children watched an adult report her preferences and dispreferences for different flavors of jelly beans: she rated some jelly beans as “really yummy” and others as “really yucky.” Children were then given a choice between two boxes of jelly beans to take home and were more likely to choose the box of jelly beans the adult said was “really yummy.” This study provides evidence that children consider other people’s opinions when selecting foods themselves. Further research on children’s learning from testimony has shown that children do not treat all informants equally. Instead, children tend to trust the information provided by familiar over unfamiliar people, reliable over unreliable people, experts over nonexperts, nice over mean people, members of social in-groups over members of out-groups, and people who are able bodied or of average weight over people who are physically disabled or obese. This conclusion is based on studies in which children are presented with two informants who differ from one another in some way (e.g., one is an expert and one is nonexpert; one nice and one is mean) and provide conflicting information about a target (e.g., the expert says a novel object is called a “dax” and the nonexpert says the same object is called a “blicket”).
Then, as a measure of which piece of testimony children accept, participants are asked what the object is called. If a consensus is observed across children (e.g., if children say the object is a “dax”), then researchers conclude that children consider the factor manipulated in the study when deciding whose information they should accept.

Although the majority of research on children’s “selective trust” (i.e., examining the contexts that influence what testimony children tend to accept, and from whom they tend to accept it) has been conducted outside the domain of food, a handful of studies have featured foods as stimuli. As in other domains, children tend to discount information about a food’s taste or healthfulness that is provided by someone who has previously proven to be unreliable, and also favor testimony provided by people who match their social identities. For example, one group of 4-year-old children in one study were introduced to an adult who incorrectly reported the contents of a bag (e.g., the adult said “there’s a crayon inside of the bag” when children knew that the bag contained a ball). Then, the adult showed children an opaque white box and told children that a food inside the box was either healthy, unhealthy, yummy, or yucky. Another group of children were introduced to an adult who accurately reported the contents of the bag, and then provided the same information about an unseen food. Children were less likely to trust the adult’s testimony when that person had been inaccurate in the past (compared to children who heard information about food from an adult who had been accurate). In other studies, 3- and 4-year-old children liked novel foods that had been endorsed by someone who matched their gender and age more than foods that had been endorsed by people who differed on these dimensions.

Methods employed to study children’s learning from testimony may provide a practical solution to implementing some suggestions from the social modeling literature. Specifically, several studies have shown that children eat more of foods that they see other children eat and enjoy, but it would be impossible for parents to assemble a panel of children every time they are trying to encourage their own child to eat a food. However, in one recent series of studies, we found that simply learning about other children’s food preferences, without actually seeing other children eat, can guide children’s eating behavior. In one experiment, 5- and 6-year-old children heard an adult teacher describe two foods: One food was described as popular among other children, whereas the other food was described as unpopular; besides these descriptions, the foods were identical. Although participants did not see any other children during the study, their eating behavior was influenced by what they were told other children thought about the foods: Participants ate more of the food that was described as popular with other children and they evaluated the food’s flavor more positively. In a second experiment that used a similar procedure, children heard that one food was popular with children and the other food was popular with adults and were offered the foods to eat if they wished. Children ate more of the food that was popular among children than the food that was popular among adults, suggesting that they are particularly sensitive to social information about peers’
food preferences, even when those peers were not present. In a third experiment, children were presented with a series of foods that were modified by adding different amounts of lemon juice (1, 2, 3, or 4 mL). Foods were either described as “popular” or “unpopular” and children were asked to classify each food as “sweet” or “sour.” When the food’s flavor was ambiguous (i.e., 2 or 3 mL of lemon juice had been added), children were more likely to classify the “popular” foods as “sweet” and the “unpopular” foods as “sour.” Taken together, these studies suggest that just hearing other children’s opinions about foods can have a powerful influence on children’s eating behavior, even if children have not directly observed their peers’ behavior (Box 14.4).

**SOCIAL LEARNING: TESTIMONY ABOUT HEALTH**

Of course, liking and taste are not the only important pieces of information to consider when deciding what to eat. Given the importance of promoting healthy eating in childhood, understanding how best to communicate information about health to children is an important enterprise. For example, in one study, 3- and 4-year-old children were asked to select whom they would like to ask about a food’s health status (healthy or unhealthy). The experimenter said, for example, “If you wanted to know if a food is healthy, who would you ask? A cartoon? A chair? A child? A clown? A mom? A rock? A stranger? A teacher?” Children were especially likely to respond that they would ask a mother or a teacher about the food’s health status, compared to the other alternatives. This result and related findings indicate that children think adults know a great deal about nutrition and health. Consequently, children should be especially likely to learn about food from trusted adults.

In addition to showing that children rely on trusted adults for information about the healthfulness of food, studies suggest that detailed messages about food and health, particularly those that refer to causal mechanisms and build on children’s existing knowledge, can also effectively promote children’s health knowledge and healthy behaviors.
in the food domain. For instance, 8- and 9-year-old children who received instruction about the causal mechanisms of disease transmission were more likely to wash their hands before preparing a snack for other people than children who did not learn causal information. A recent study used a similar strategy of building on children’s existing knowledge and theories to improve preschool-age children’s nutrition knowledge and healthy food choices. In this study, a novel lesson-based intervention was developed based on important conceptual prerequisites for understanding the link between food and nutrition. For instance, in order to understand how digesting foods transmits the nutrients contained in those foods throughout the body, children must appreciate that the foods we eat are made up of tiny particles (such as vitamins, proteins, and fats) that we cannot see directly when we look at those foods. Overall, these lessons focused on one key nutrition-related concept: Eating a variety of healthy foods is important to take in diverse nutrients. The intervention broke down this concept into multiple lessons that highlighted different aspects of variety and used analogies that built on children’s initial knowledge and theories, including that just eating one type of food is not a healthy diet (e.g., one would not build a bicycle only out of handlebars, just as one would not build a healthy diet by eating only cookies or only broccoli); that the digestive system breaks down food, extracts nutrients, and sends nutrients throughout the body; that foods can contain similar nutrients even if they look different on the outside (e.g., eggs, meat, and beans are all protein–rich foods); that nutrients exist even though they cannot be seen by the naked eye; and that different nutrients support different biological functions. One group of children received this intervention at their preschool, whereas different groups of children at the same preschool were assigned to a no-intervention control group or an intervention based on existing nutrition education materials. The existing materials modeled healthy eating and emphasized the enjoyment of healthy eating and exercise but did not build on children’s biological theories. After the 12-week intervention, children’s nutrition knowledge was measured. Children in the theory-based intervention demonstrated more accurate and thorough nutrition knowledge than children in the no-intervention control group or children in the existing nutrition education group. Children’s food choices at snack time were also observed; children in the theory-based intervention also ate more vegetables at snack time than did children in the other groups. This study highlights that understanding and expanding on children’s early biological theories is important to build their nutrition knowledge.

Although children may be capable of learning detailed information about food health, this ability does not always translate into healthy behaviors. In one study of preschool-age children (3- to 5.5-year-olds), an adult introduced a character (e.g., “Tara”) who ate a food that was described in different ways to different children in the study. Some children heard the foods described with an instrumental goal (e.g., “Tara felt strong and healthy” or “Tara knows that eating baby carrots will help her know how to read”). Other children heard that Tara just thought the food tasted good (“Tara knows that eating the baby
carrots will be yummy and fun”). Children rated the food as less tasty and ate less food if they heard the food described with an instrumental goal rather than with information about its palatability. In another study with 9- and 10-year-old children, children liked a novel drink labeled as “a new health drink” less than the very same drink labeled just as “a new drink” and reported that they would be less likely to ask their parents to buy the “new health drink.” Similar effects may persist into adulthood, too. One recent study showed that providing more indulgent taste-based descriptions of healthy foods (e.g., “dynamite chili and tangy lime-seasoned beets”) encourages greater consumption than providing either a healthy but restrictive message (e.g., “lighter-choice beets with no added sugar”), a positive health message (“high-antioxidant beets”), or a very basic description (e.g., “beets”). Taken together, these studies suggest that hearing that foods are healthy may not actually persuade people across ages to eat them.

On face, these findings may appear to be discrepant—children can learn complex information about health and nutrition in intervention studies, but do not always use information about health to select what to eat. Although describing foods as “healthy” may not be an effective way to increase the amount of healthy foods that children eat, new research suggests that describing foods as “unhealthy” may help children avoid those foods. In a series of controlled laboratory studies, an adult described as a teacher presented 5- and 6-year-old children with information about two foods that were in fact identical (e.g., two servings of applesauce). In three initial studies, the teacher described one food as healthy but not popular with other children and described the other food as popular with other children but not healthy. Children were told these messages by an adult teacher (either in the lab or at their elementary school) or by another child. Across these three contexts, children ate more of the food described as healthy but not popular compared to the food described as popular but not healthy; they also rated the healthy/unpopular food’s flavor more positively. This might be considered surprising given that children: (a) prefer foods that are popular rather than unpopular with peers, and (b) tend to avoid foods described as healthy. However, a series of follow-up studies revealed that children were avoiding unhealthy foods, rather than actually preferring healthy foods. First, children ate more of a neutral food (described as “right here”) than food described as “unhealthy,” but ate similar amounts of a neutral food and a “healthy” food. Second, children ate more of a food described as “unpopular” than a food described as “unhealthy,” even though both foods were described negatively. Taken together, these results suggest that children are less willing to eat an unhealthy food compared to other alternatives (including healthy foods and unpopular foods), but do not necessarily seek out healthy foods. These findings provide further evidence of the challenges of encouraging people to eat more healthy foods, but also reveals a potentially useful alternative strategy: Capitalizing on an early understanding to avoid unhealthy foods. Moreover, these nuanced findings demonstrate the power of laboratory studies to dig deeper into the mechanisms underlying children’s eating behavior (Box 14.5).
CONCLUSIONS AND OPEN QUESTIONS

The experiments described in this chapter highlight the important role of social learning in infants’ and children’s understanding of the food domain. Children’s initial food knowledge is incomplete, but even infants have some understanding of the social nature of eating and use other people’s food choices to guide their own food selection and cognition. As children develop, children’s understanding of food improves—in large part, we argue, because they have had additional opportunities to learn from the members of their culture and engage in social interactions surrounding food (in addition to general improvements in children’s reasoning skills). Children’s developing reasoning about food is important to consider both as it pertains to understanding children’s food choices and identifying novel intervention points to promote healthy eating, but also as a window into understanding how children think about the world and learn new information more generally by considering behaviors they engage in on a daily basis.

Of course, children’s interest and ability to learn from others could be either helpful or detrimental for establishing a healthy diet. Social learning is helpful if children are surrounded by people who consistently make healthy choices and present children with accurate information about health, but potentially problematic if children are surrounded by people who make unhealthy choices or present inaccurate or inconsistent information. Similarly, children’s tendency to learn from other people makes them particularly susceptible to marketing strategies that reference social symbols, such as popular brands and characters. Again, to the extent that marketers advertise healthy foods, children’s susceptibility could be viewed in a positive light. However, despite recent efforts to limit children’s exposure to advertisements for junk food, the vast majority of ads to which children are exposed feature processed foods with high levels of fat, sodium, and sugar. Such advertisements are effective: Children who view food advertisements eat more of the foods featured in the advertisements, even after controlling for other factors such as socioeconomic status and overall television viewing time. These issues becomes even more challenging in the context of social media, as children are also exposed to advertisements (sometimes disguised as computer games) through online platforms, further highlighting that the content of social messages can either positively or negatively guide children’s health behaviors.

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BOX 14.5

- Encouraging people to eat more healthy foods is challenging across the lifespan.
- Intervention approaches that expand on children’s early biological theories may be most likely to improve children’s nutrition knowledge and increase children’s vegetable intake.
- Children may not necessarily be interested in eating healthy foods, but they are interested in avoiding unhealthy foods; they also prefer foods with descriptions that appeal to taste.

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Many important open questions remain regarding the nature and consequences of children’s social learning about food. First, we highlighted several studies of infants’ social learning about food. However, little is known about the potential relation between the early emerging capacity to understand the social nature of food and infants’ actual eating behavior or trajectories. Infants’ own diets undergo a rapid period of expansion (i.e., from milk to solid foods) during the same period in which many of the studies we referenced were conducted, but the effect of social modeling on infants’ acceptance of novel foods has not received much attention in the literature. Understanding individual differences in infants’ responsivity to modeling could inform the tailoring of intervention strategies, an important question given that faster rates of weight gain in infancy have been linked with future obesity risk.  

Second, the studies we highlighted on children’s learning from observing other people, and in particularly their learning from testimony, suggest that children readily accept information offered by people they trust, such as their parents. These studies suggest that simply pointing out which foods are unhealthy and highlighting the negative consequences of unhealthy eating may be a successful strategy for improving children’s food choices, especially in light of evidence that children are capable of learning complex information about food. However, it is unclear how frequently caregivers actually talk about health in their day-to-day interactions with their children. It is possible that many parents may underestimate their children’s capability to think about food beyond just their likes and dislikes. In addition, it is possible that this information may only be effective if it matches with the behaviors that children observe adults performing. Many school-based interventions that focus on verbally teaching children about foods have been implemented with, at best, modest effects on children’s health outcomes. However, it is possible that these messages conflict with what they actually observe other children and adults eating, particularly in light of initial evidence that the amount of food children observe other people eating predicts how much food children eat themselves. Discovering the kinds of messages about health that effectively guide children’s behavior is an important starting place, but it may be equally important to back up those statements with action or deliver those messages in multiple contexts (i.e., both at school and at home). Future research on questions such as these is important not only to better understand development in the food domain but also to design interventions that improve children’s health.

Third, we highlighted research examining children’s food categorization, food rejections, and experience of disgust, yet we are currently lacking an integrated framework to understand how these domains causally influence each other and the contribution of other processes, such as social transmission of disgust and genetic differences in taste perception. These topics have been explored in isolation and a few studies have examined associations between some of these constructs (e.g., rejection and categorization), but there are many open questions concerning the causal mechanisms that contribute to the way these processes unfold in the preschool years, a time when children are
undergoing change in all three of these domains. At young ages, children often demonstrate distaste toward foods they do not like, but disgust based on one’s perceptual experience is traditionally considered to be an immature form of disgust, compared to disgust based on one’s knowledge about a food (i.e., disgust based on contamination, even if the food appears safe). \textsuperscript{25,91} The development of food preferences and picky eating are important to consider in this context; however, disgust is rarely studied directly in these investigations. For example, the Child Eating Behavior Questionnaire [CEBQ] \textsuperscript{92} includes a few items that are relevant for thinking about disgust because they include items about rejecting food on ideational grounds (such as the Food Fussiness subscale). Yet, searching for “CEBQ” and “disgust” on Google Scholar returns surprisingly few results (20 as of August 2017). In one study returned by this search, overweight children were less accurate than normal weight children when asked to identify and label the emotions they observed in a series of face photographs, but disgust faces were not included in this stimuli set. \textsuperscript{93} The dearth of research at the intersection of disgust, food selection, and health suggests important opportunities for interdisciplinary collaboration. Social reasoning may play an important role in future research on this topic, given that disgust has important cultural links. \textsuperscript{28} For instance, although insects are eaten regularly in many parts of the world, eating insects is largely considered to be disgusting in Western cultures, providing a major barrier to wider adoption of insects as a sustainable protein source. \textsuperscript{94,95} More research in this area, in concert with studies that examine children’s categorization abilities as discussed previously, would shed light on these questions. These questions are important to consider both to avoid nutritional deficiencies that can stem from extreme cases of food rejection \textsuperscript{96,97} and to help mitigate the role of children’s food rejections as a major source of stress in parent–child interactions. \textsuperscript{98}

Taken together, this chapter highlights how basic developmental science research can enrich our understanding of children’s development in the food domain. Large-scale correlational studies can shed light on important health outcomes for children and are critical for developing a complete understanding of how to promote children’s health and well-being. However, carefully controlled laboratory studies can be a useful tool to test mechanisms underlying children’s thinking and eating. Collaborations between basic developmental psychologists and public health professionals, using methods that are familiar to each, may be particularly fruitful ways to advance our understanding of children’s food selection and improve children’s eating.

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