CHAPTER 2

Determinants of Food Choice and Dietary Change: Implications for Nutrition Education

OVERVIEW

This chapter provides an overview of the numerous influences on food choice and dietary practices. Understanding these influences will help nutrition educators assess the audiences or populations with whom they work and to design appropriate and relevant nutrition education. These influences are called determinants. The chapter also provides a description of the desired competencies for nutrition educators outlined by world's major professional nutrition education society.

CHAPTER OUTLINE

- Determinants of food choice and diet-related behavior: an overview
- Food-related determinants: biology and experience
- Person-related determinants
- Social and environmental determinants
- What does all this mean for nutrition educators?
- Implications for competencies and skills needed by nutrition educators
- Chapter summary

LEARNING OBJECTIVES

At the end of the chapter, you should be able to:

- Describe the research evidence for the influences of biological predispositions, individuals' experience with food, personal factors, and environmental factors on human food choice and dietary behaviors
- Understand the key role of intra- and interpersonal cultural and psychosocial processes in food choices and dietary behaviors
- Appreciate the importance of these understandings for designing effective nutrition education
- State the competencies needed to be an effective nutrition educator

Determinants of Food Choice and Diet-Related Behavior: An Overview

You may have known a person like Alicia: She knows a lot about nutrition, and, in particular, she knows that she should eat more fruits and vegetables. She just can't seem to do it. Or Maria, who wants her young daughter to be healthy but does not know quite what she should do. Or Ray, who wants to lose weight and knows what he is supposed to do, but just can't seem to get to it. Or maybe it is you—there is some eating habit you want to change but don't.

Nutrition education is often seen as the process of translating the findings of nutrition science to various audiences using methods from the fields of education and communication. If only the public knew all that we know, nutrition educators think, surely they would eat better. Thus, we believe that our task as nutrition educators is solely to provide the public with the information needed to eat well. We plan sessions on our government's food guide such as the United States' MyPlate and food label reading. We provide lists of high-fat or high-fiber foods or food sources for nutrients such as calcium, iron, or vitamins. We discuss managing food budgets. However, studies show that simply communicating this kind of information is not enough. It is not motivating. People often know how to eat well but do not—just like Alicia, Maria, and Ray. This is because eating is about more than health. Eating is a source of pleasure and is related to many of life's social functions. Brillat-Savarin wrote a one hundred page book on taste 200 years ago in which he noted that, "Taste, such as Nature has given to us, is yet one of our senses . . . that, all things considered, procures to us the greatest of enjoyment, because: the pleasure of eating is the only one that, taken in moderation, is never followed by fatigue; it can be combined with all our other pleasures and even console us for their absence . . ." (Brillat-Savarin 1825). Eating behaviors are acquired over a lifetime and are embedded in so many aspects of our lives. Unlike other health-related behaviors such as smoking, eating is not optional. We have to eat, and any changes we make are undertaken with a great deal of ambivalence. We want to eat to satisfy physical hunger and psychological desires and yet also want to be healthy, which may require adopting eating patterns that conflict with these desires.

We make decisions about food numerous times a day: when to eat, what to eat, with whom to eat, and how much to eat. Whether the act of eating is a meal or a snack, at home or at work, the decisions are complex and the influences many. Biologically determined behavioral predispositions such as liking specific tastes are, of course, important influences. However, these can be modified by experience with food as well as by various intrapersonal factors such as our perceptions, attitudes, and cultural expectations, and interpersonal factors such as family and social networks. Additionally, environmental factors such as food access, social and cultural practices, or resources either facilitate or make it difficult to act on our biological predispositions, preferences, or personal imperatives. The influences are so numerous that they become overwhelming to try to understand. Yet, understand we must, if we want to be effective nutrition educators or communicators. It is very important for us to understand people, their behaviors, and the various forces that influence an individual's or a community's decision to eat in a particular way. This chapter simplifies matters by examining these influences in three categories that are commonly used in studying food choice or food selection: factors related to food, to the individuals making the choices, and to the external physical and social environment—factors related to food, person, and environment (Shepherd 1999). This chapter also shows how we can use this information in nutrition education.

Many factors within each of these categories that influence our eating are modifiable. These modifiable influences on our food choices or decisions (as opposed to non-modifiable ones such as age or genetics) are explored in greater detail in the sections to follow. We will call these modifiable influences *determinants*.

Food-Related Determinants: Biology and Experience

When asked, most people say their food choices are largely determined by "taste" (Clark 1998; Kaya 2016, IFIC 2019). By taste, they mean flavor, which includes smell and the oral perception of food texture as well (Small and Prescott 2005). Our sensory and emotional responses to the taste, smell, sight, and texture of food are a major influence on food preferences and food choices. What are we born with and what is learned?

BIOLOGICALLY DETERMINED BEHAVIORAL PREDISPOSITIONS

The Basic Tastes

Humans are born with biological predispositions toward liking the sweet taste and rejecting sour and bitter tastes (Desor, Mahler, and Greene 1977; Mennella and Bobowski 2015; Gravina, Yep, and Khan 2013). The liking of the sweet taste remains throughout life and appears to be universal to all cultures (Drewnowski et al. 2012). The liking of salt seems to develop several months after birth, when infants have matured somewhat (Mattes 1997; Geerling and Loewy 2008). It has been suggested that these predispositions may have had adaptive value: the liking of the sweet taste because it signals a safe carbohydrate source of calories and the rejection of bitterness because it may signal potential poisons.

A fifth taste has been identified: umami, a Japanese word for deliciousness, which is associated with a savory taste such as the brothiness of soup or the meatiness in mushrooms. It seems to be related to glutamate, an amino acid, and may capture the taste of protein in food (Kurihara 2015).

Preference for fat may also be a basic taste from recent research (Gravina, Yep, and Khan 2013; Running et al. 2015). Fat is less a flavor than a contributor to texture but some genes are thought to be related to the fat taste (Breslin and Spector 2008; Tucker et al. 2014). It imparts different textures to different foods; it makes dairy products such as ice cream seem creamy, meat juicy and tender, pastries flaky, and cakes moist. Many high-fat foods are those in which fat is paired with sugar (desserts) or salt (potato chips), enhancing their palatability. Foods containing fat are more varied, rich tasting, and higher in energy density than nonfat foods and hence are more appealing. Additionally, because some taste buds are surrounded by free nerve endings of the trigeminal nerve, people are able to experience the burn from hot peppers and the coolness of menthol (Breslin and Spector 2008).

Individual Differences: Nontasters and Supertasters

Some genetic differences in sensitivity to tastes exist between individuals. Research shows that people differ in their responses to two bitter compounds called phenylthiocarbamide (PTC) and 6-*n*-propylthiouracil (PROP). Some people cannot taste it and are labeled nontasters, others are medium tasters, and still others are supertasters (Tepper 2008; Lipchock et al. 2013). Such differences among individuals may be related to differences in being able to discriminate among different foods and may contribute to some of the differences in liking certain foods (Tepper 2008).

Satisfying Hunger

Many genetic and biological mechanisms control our feelings of hunger and fullness (called satiety), ensuring that people will eat enough to meet their energy needs (de Castro 2010). Throughout most of human history, getting enough food was the primary challenge. The human body developed in an environment where food was scarce and high levels of physical activity were mandatory for survival, leading to various physiological mechanisms that encourage the body to deposit energy (i.e., fat) and defend against energy loss (Konner and Eaton 2010; Chakravarthy and Booth 2004; Genne-Bacon 2014; Pontzer et al. 2018). Today's environment, however, is different. Researchers have proposed that the "modern environment has taken body weight control from an unconscious process to one that requires substantial cognitive effort. In the current environment, people who are not devoting substantial conscious effort to managing body weight are probably gaining weight" (Peters et al. 2002).

Our Preference for Calorie-Dense Foods

In addition to these physiological mechanisms, humans seem to prefer the taste of calorie-dense foods over calorie-dilute versions of the same foods (Birch 1992; Birch and Fisher 1995). This preference was very adaptive when food, and especially calorie-dense food, was scarce and probably explains the universal liking for calorie-dense foods in children and adults. The finding that such foods induce overeating and obesity in animals (Sclafani and Ackroff 2004; Birch and Anzman-Frasca 2011a) suggests that this feature is less adaptive for humans in today's environment, where relatively cheap, highly processed calorie-dense foods are widely available (Monteiro et al. 2013).

Specific Tastes or Sensory-Specific Satiety

Humans have a built-in biologically determined mechanism whereby we get tired of one taste and move on to another one over a short time span, such as while eating

A combination of fat, salt, and sugar can make foods very attractive to eat in large quantities.

a meal (Rolls 2000). This mechanism is called *sensory-specific satiety*. Such a mechanism probably had adaptive value for humans because it ensures that people eat a variety of different-tasting foods and thus obtain all the nutrients they need from these foods. Studies also reveal that for adults, greater variety stimulates greater intake. Again, this mechanism might have been very useful in a situation where food was scarce while in today's food environment, variety in meals may contribute to overweight.

In summary, these biological predispositions contribute to some degree to preference and to food choices or food selections and behavior, particularly in children, and are shown in **FIGURE 2-1**. In today's food marketplace, food products are being specially formulated to take advantage of these biological predispositions by manipulating their fat, salt, and sugar content to make them more desirable (Gearhardt et al. 2011; Moss 2013; Hebebrand et al. 2014). However, as we see in the next section, these biological predispositions can be modified and most specific preferences are actually learned or conditioned—which is good news for nutrition educators because that means we can help people navigate this challenging food environment and learn to like healthful foods.

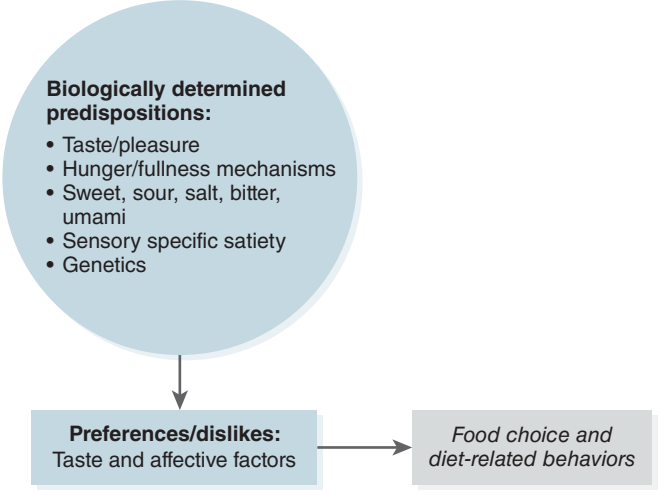

FIGURE 2-1 Our biologically determined behavioral predispositions influence food choices and dietary behaviors.

EXPERIENCE WITH FOOD

Research suggests that people's liking for specific foods and their food acceptance patterns are largely learned (Birch 1999, 2014; Birch and Anzman-Frasca 2011a; Mennella and Beauchamp 2004; Beauchamp and Mennella 2009). Learning, in this context, does not mean cognitive learning but rather *physiological learning* or *conditioning* arising from the positive or negative consequences that people experience physically and emotionally from repeated exposure to a food.

Pre- and Postnatal Experience

Such learning begins early, even prenatally. Flavors such as garlic and alcohol have been detected in mothers' milk, possibly familiarizing infants with these flavors (Beauchamp and Mennella 2009. In one study, breastfed infants whose mothers were fed carrot juice during pregnancy or breastfeeding showed increased acceptance of carrot flavor in their cereal at weaning (Mennella, Jagnow, and Beauchamp 2001). In another study, infants who were fed a formula made of an unpleasant-tasting, sour and bitter protein (hydrosylate) from birth (from necessity because they did not tolerate milk) drank it well when tested with the hydrosylate formula at 7 months, whereas those fed milk formula rejected it (Mennella, Griffin, and Beauchamp 2004). There appear to be sensitive periods during which early experience has more impact on flavor learning (Trabulsi and Mennella 2012).

Learning from the Physiological Consequences of Eating: Preferences and Aversions

How humans feel physiologically after eating a food can have a powerful impact on food preferences. If eating is followed by negative effects, such as a feeling of nausea, a conditioned aversion follows. Conditioned aversions can

be quite powerful. A one-time experience of illness following eating a food can turn us off that food for decades. On the other hand, liking for foods usually develops more slowly through a process of learned or conditioned preference, whereby repeated eating of a food, or familiarity, is followed by pleasant consequences such as a feeling of fullness or satiety.

Conditioning of food preferences continues throughout our lives, but early experience with food and eating is especially crucial in the development of eating patterns, in terms of both the kinds of food we come to like and the amount we eat. Indeed, one study found that the food preferences of children 2–3 years old persisted into adolescence and early adulthood, confirming the importance of these early experiences with food (Nicklaus et al. 2004). Experience with food influences the development of eating patterns of children and adults in several ways.

Exposure to New Foods

Humans, like other omnivores, experience the "omnivore's dilemma": we need to seek variety in our diets to meet nutritional requirements, but ingesting new substances can be potentially dangerous (Rozin 1988). This dilemma can be resolved through familiarity and conditioning.

Research has shown that repeated opportunities to taste new foods is the key to developing preferences for these foods, often requiring 6–12 or more exposures (Savage, Fisher, and Birch 2007; Anzman-Frasca et al. 2012), and probably through a "learned safety" mechanism. That is, when eating a food is not followed by negative consequences, the child learns it is safe to eat and increased food acceptance results. Once the foods are familiar, the preferences tend to persist (Skinner et al. 2002). Additionally, tasting or actual ingestion has been found to be necessary—not just looking at or smelling the food (Savage et al. 2007).

Neophobia and Picky/Fussy Eating

Although food neophobia, or fear of new foods, is minimal in infants, it increases through early childhood so that 2- to 5-year-olds, like other young omnivores, demonstrate neophobia (Birch 1999; Dovey et al. 2008). This would have adaptive value because infants are fed by adults, whereas toddlers are beginning to explore their world and have not learned yet what is safe to eat and what is not. However, neophobia can be reduced by repeated opportunities to sample new foods (Dovey et al. 2008).

Neophobia often occurs during early childhood.

Picky or fussy eating is somewhat different—it is the rejection of a large proportion of familiar (as well as new or novel) foods, tending to result in a diet that is lower in variety (Dovey et al. 2008). This quality tends to persist, even into adulthood and may have a genetic component. Here, even more frequent food exposures may be necessary for acceptance to occur, presenting a challenge to parents and nutrition educators alike.

In sum, with repeated consumption, preference for initially novel foods tends to increase. Thus, if children are exposed to many high-sugar, high-fat, and high-salt foods at home, at school, and in other settings, these foods will become more familiar and will become preferred over those that remain relatively unfamiliar, such as vegetables or whole grains (Birch and Anzman-Frasca 2011a).

Influence of Experience with Food on the Basic Tastes

Biologically determined behavioral propensities can be modified by experience in adults as well (Pliner, Pelchat, and Grabski 1993; Pelchat and Pliner 1995). For example, those who eat lower-salt diets come to like them more (Mattes 1997). The dislike for bitterness can be overcome, as shown by the study described earlier where infants, with experience, comfortably consumed the bitter protein hydrosylate and by the fact that people come to like a variety of bitter tastes, such as coffee, dark chocolate, or bitter vegetables such as broccoli. Sour tastes, such as vinegar and grapefruit, can also be acquired. Likewise, the liking for dietary fat can be modified. Studies have found that those who switched from a high-fat diet to

naturally low-fat foods such as grains and vegetables (Mattes 1993) or to reduced-fat foods (Ledikwe et al. 2007) came to like the fat taste less. Maintaining these changed preferences involved continuing to eat these new foods.

Learning What Fullness Means: Conditioned Satiety

Research shows that, surprisingly, in both young children and adults, feeling full, or satiety, is also influenced by associative conditioning or learning (Birch et al. 1987; Birch and Fisher 1995). The ability of our bodies to learn about how full familiar foods can make us feel may explain how it is that we end meals most often before we have yet experienced the physiological cues that signal satiety. Thus, as a result of repeatedly consuming familiar foods, people's bodies recognize the "filling" and the "fattening" quality of familiar foods and normally make adjustments in what they eat in anticipation of the end of the meal (Stunkard 1975). This is supported by the repeated observations that portion size is influenced by outside events, such as serving size, size of plate, and so forth (Fisher and Kjal 2008; DiSantis et al. 2013).

LEARNING FROM SOCIAL-AFFECTIVE CONTEXT: SOCIAL CONDITIONING

The emotional context, called the social-affective context, of eating also has a powerful impact on food preferences and on the regulation of how much people eat. Food is eaten many times a day in many different contexts, providing opportunities for individuals' emotional responses to the social context of eating to become associated with the specific foods being eaten. This is particularly true of children.

Social Modeling

Children learn about food not only from the direct experience of eating but also from observing the behaviors of peers and adults (Birch 1999). Familiar adults have been found to be more effective models than unfamiliar ones, and having the adults themselves eat the same foods is more effective than when adults offer the foods without eating the foods themselves (Harper and Sanders 1975; Addessi et al. 2005). Food preferences also increase when adults offer the foods in a friendly way (Birch 1999). Children are also influenced by their peers. In one study, preschool children who, at snack time, observed other children eating and liking vegetables that they did not like, increased their liking and intake (Birch 1999).

Food Parenting Practices

Parents create a home environment that plays a critical role in shaping children's food preferences, eating behaviors, and energy intake (Savage, Fisher, and Birch 2007; Frankel et al. 2012). Children learn what, when, and how much to eat based on the transmission of cultural and family beliefs, attitudes, and practices. Parenting practices are specific parental actions or behaviors that are designed to influence children's eating behaviors and nourishment. Parents shape children's eating behaviors by the foods they make available to children (as food providers), by their own eating styles (as role models), how they discipline their children around food issues, the policies they set, and their actual child feeding practices. These feeding practices may be carried out not only by parents but also by family and other caregivers, and these practices can encourage healthful eating or modify and interfere with the child's ability to respond to food appropriately. We use the term "parents" to refer to all those who care for the child.

These practices may be seen as falling into three general categories: structure, by which we mean parents' organization of children's environment (Grolnik and Pomerantz 2009); control, by which we mean [parents' behaviors of controlling what children eat; and support for autonomy, by which we mean nurturing children's sense of choice and capacity for self-direction (Vaughn et al. 2016; O'Connor et al. 2017). Some of the specific practices in each category will be described below.

Structure

Parents or Families as Providers of Food: Exposure and accessibility The types of foods and beverages parents make readily available in the home will affect what children eat and drink. Parents can shape their children's food preferences by frequently exposing them to healthy foods at home and making those foods more easily accessible. Putting fruits and vegetables in a place where the child can easily reach them (e.g., in a bowl on the table or on a lower shelf in the refrigerator) and preparing them into sizes that are easy to eat (e.g., fruit cut into bite-size pieces) may increase the child's intake of these foods (Baranowski, Cullen, and Baranowski 1999).

Parents and Families as Providers of Food: Portion Sizes While very young children seem to be able to adjust their intakes to some extent over time (Cecil et al. 2005), recent studies show that portion sizes influence the amount eaten by children as young as 2 years of age (Fisher et al. 2007; Birch, Savage, and Fisher 2015). Many parents apparently are not concerned about portion sizes for their children, assuming children will select appropriate sizes (Croker, Sweetman, and Cooke 2009). Yet, many studies of meals with energy-dense foods show that the larger the portion size, the more consumed (Fisher and Kjal 2008; Fisher et al. 2007). Indeed, when children are allowed to serve themselves, they tend to eat more (Savage et al. 2012). Thus, parents need to learn more about age-appropriate serving sizes and offer these to children. The good news is that serving vegetables as a soup or first course at the beginning of a meal (Spill et al. 2010, 2011) or placing large amounts of fruits and vegetables on the dinner plate also increases consumption of these items (Mathias et al. 2012).

Parental Role Modeling Parents can indirectly influence their children's eating habits by modeling good eating behaviors. Evidence suggests that parents who eat fruits and vegetables and other healthy foods have children who eat more healthfully (Blissett 2011; O'Connor et al. 2010). Unfortunately, modeling of negative behaviors can have an equally strong but opposite effect and has been associated with the development of emotional eating, excessive snacking, and body dissatisfaction (Brown and Ogden 2004). These may include eating when bored or angry, eating when watching TV or reading, or consistently eating second helpings (Gattshall et al. 2008) Thus, parents and caregivers who offer healthful foods in appropriate portion sizes and enjoy the foods themselves are likely to facilitate healthful eating in their children.

Parental Policies and Rules The policies or rules parents set for their children are also important. These apply to *what* types of food are encouraged or limited (e.g., children should be encouraged to taste new foods whenever possible [Gattshall et al. 2008]); *when* certain foods can be eaten (e.g., snacks after school); and *where* foods and snacks can be eaten (e.g., children can be encouraged to eat at a table and/or should not eat in their bedrooms). Parents make known the guidelines or boundaries of how much and what kind of foods to eat and the timing or routine of meals. How these rules are communicated to the child and applied is crucial and will likely reflect the parents' feeding style.

Social Context: Meal and Snack Routines Routines include where meals are served, whether family members are present, and whether there are distractions (such as the TV) during meals. There is evidence that children who eat with their families consume more healthy foods and nutrients. Children and adolescents who have companionship at mealtimes eat better (Stankek et al. 1990; Neumark-Sztainer et al. 2003) and these eating patterns persist over time (Larson et al. 2007). Adolescents who watch television during meals are more likely to eat poorer quality diets and have a higher weight status (Vik et al. 2013).

Interviews with parents suggest that they use a variety of practical strategies to encourage their children to eat healthfully (Carnell et al. 2011; Blisset 2011; O'Connor et al. 2010). These include presenting foods in an attractive way; verbal encouragement; making eating healthful foods fun; use of teachable moments, involving the child; and flexible responses to individual differences shown by children.

Control

Pressure to Eat Healthful Food and Restricting Access to Less Healthful Food Pressuring children to eat healthful foods and restricting less healthful foods are behaviors widely practiced by parents (Savage et al. 2007; O'Connor et al. 2010; Carnell et al. 2011). The relationship of these practices by parents and caregivers to children's preferences and intakes are quite complex (Blisset 2011; Vaughn 2016). Some research suggests the excessive use of pressure to eat specific—usually healthy—foods is associated with lower intakes and more negative comments about those pressured foods. Here the parent is forceful or demanding in order to push the child to eat food that is served during a meal or snack even if the child is not hungry. Likewise, high levels of restriction or coercive control of children's access or intake of specific foods, usually those that are most tasty because of their high sugar, fat, and/or salt content, may increase preference for, and consumption of, these items (Savage et al. 2007; Vaughn 2016; O'Connor 2017).

Rewards The use of rewards is another very common but controversial practice of parents (Ventura and Birch 2008). There is concern that rewards might reduce reasoned action and intrinsic motivation. There is evidence that non-food tangible rewards (e.g., stickers) or non-tangible rewards (praise) can be highly effective in encouraging children to taste new or initially moderately disliked foods such as vegetables sufficiently often so that

children become familiar with the foods and benefit from the familiarity effect (Cooke et al. 2011b).

For example, some studies found that exposure plus rewards increased the liking and intake for the targeted vegetables (Wardle et al. 2003; Remington et al. 2012). In a peer-modeling plus reward-based intervention, children aged 4–11 years watched video adventures of heroic cartoon characters eating fruits and vegetables and were given rewards for tasting the fruits and vegetables that the cartoon models ate. Liking for both fruits and vegetables increased significantly, as did consumption, both immediately after the intervention and at a 4-month follow-up, after gradual withdrawal of the rewards (Horne et al. 2004, 2011). Social rewards (praise) can be more effective than tangible rewards (Cooke et al. 2011a). Incentives offered in the school context have also increased intake of fruits and vegetables (Hendy, Williams, and Camise 2005). These findings suggest that judicious use of rewards can facilitate healthy eating by getting children to at least try new, or initially disliked foods, and hence become familiar with them (Cooke et al. 2011a).

Autonomy Support

Autonomy support involves helping children to develop a sense of ownership, or endorsement of, the healthful eating patterns that the parent is encouraging and the capacity to make their own decisions (Vaughn et al. 2016; O'Connor et al. 2017). To achieve this, the parent can encourage healthful eating, provide sufficient structure within which the child can be involved in making choices, involve the child in food-related activities and engage in conversations with the child about the reasons for the rules and boundaries, and provide appropriate nutrition education.

Encouragement to Eat Healthful Food and Guided Choices This approach involves the parent prompting the child to eat healthful food without being overly forceful or coercive. For example, a parent might encourage, with warmth, the child to choose from or eat foods that are good for him or her, or ask the child to try at least one bite of new foods, which may be effective in increasing intake and preference (Blisset 2011). Again, in terms of setting boundaries and limiting choice, a middle ground of mealtime rules and limits on unhealthy snacks seems to be effective. This is a discrete parental practice and represents a balance in sharing of control and decision-making between parent and child.

Child Involvement The parent acknowledges that the child is an independent individual and takes the child's preferences into consideration by actively involving the child during meal planning, grocery shopping, and meal preparation with the goal of motivating more nutritious intake. This includes letting the child serve him- or herself and decide how much food he or she eats, letting the child choose fruits and vegetables at the store, or making the food interesting in terms of seasoning or method of preparation.

Reasoning and Education Parents can help children learn decision-making skills by using mealtime to discuss the foods' nutritional qualities as well as the benefits of eating healthful foods or the consequences of eating unhealthy ones. Parents use explanations to persuade the child to eat healthfully. The reasoning can become more complex as the children get older.

Parental Feeding Styles

Parents influence their children's eating not only by their practices but also by their feeding styles. By *parenting feeding styles*, we mean the attitudes and beliefs of parents that create the socio-emotional climate in which parenting practices are conducted (Rhee 2008; Blisset 2011). Parental feeding styles vary on the dimensions of responsiveness to the child (warmth and nurturance) versus control (expectations and demands) [Hughes et al. 2005; Blissett 2011]). The *authoritarian* feeding style involves high expectations or involvement with the child and encourages eating using highly controlling behaviors or strict rules, threats, or bribes, with little regard for the child's needs (cold and unresponsive to the child). The *authoritative* style is not only typified by high expectations or involvement with the child's diet and eating behavior with a clear set of boundaries but also by high warmth and sensitivity to child needs. It involves actively encouraging eating through non-directive and supportive behaviors, such as reasoning with the child or explaining why it is important to eat vegetables. By contrast, the *permissive parenting styles* are characterized by lack of structure and allowing children to make many decisions for themselves and setting few rules or boundaries. There are two types, one where parents are overly *indulgent* (expressing warmth and responsiveness to child needs) and another where parents are *uninvolved/neglectful* (lacking warmth and responsiveness and indifferent to child's needs). Parental feeding styles can have long-term consequences (Berge et al. 2010; Fuemmeler et al. 2012).

There has been considerable concern that the *authoritarian*, or controlling feeding style, may be detrimental to child healthful eating. Indeed, it has been negatively associated with parents offering, and children eating, vegetables (Patrick et al. 2005). However, the relationship with child weight is mixed. Some studies have found an association with higher weights of children (Faith et al. 2004; Rhee 2008; Ventura and Birch 2008), and others found that authoritarian parents are equally likely to have normal weight children as overweight children (Robinson et al. 2001; Pai and Contento 2014). On the other hand, the *authoritative* feeding style, where there are clear boundaries and the child is encouraged to eat healthful foods, but where the child is also given some choice about eating options, all in a warm emotional atmosphere, has been shown to be associated with increased consumption of dairy and vegetables and decreased consumption of sweet drinks (Patrick et al. 2005; O'Connor et al. 2010; van der Horst et al. 2007).

The *permissive* parental feeding styles (both *indulgent* and *uninvolved*) appear to be the most problematic. They are related negatively to children's intake of fruits and vegetables (Blisset 2011) and nutrition-rich foods such as 100% juice, fruit, vegetables, and dairy foods (Hoerr et al. 2009). Permissive styles, in particular the indulgent style, are also most associated with higher levels of overweight children in several cultural groups (Rhee 2008; Hughes et al. 2008; Pai and Contento 2014). Permissive styles have become more common. One extensive, in-depth qualitative study found that parents stocked the house and refrigerator with individual sized snacks and meals, and children ate whatever they wanted whenever they wanted (Ochs and Beck 2013). In reality, parents use a mixture of styles (although one or another style may dominate) and parenting styles and practices are closely interconnected (O'Connor et al. 2010; Carnell et al. 2011).

Clearly, neither too much nor too little control is effective. Encouragement to eat healthy foods is desirable, as are clear boundaries. It is the emotional tone and the way these practices are carried out that is the issue. The authoritative style seems to work best. It is typified by setting boundaries and using non-controlling practices that encourage healthful eating but do not force consumption, accompanied by moderately restrictive practices about eating less healthful foods and snacks, all in a climate of emotional warmth and sensitivity to the child (Blisset 2011; O'Connor et al. 2010). This authoritative approach is the basis of a popular child feeding book by Satter (2000), who has proposed a "division of responsibility," where parents take on the responsibility of what, when, and where, and the child takes on how much and whether. That is, parents should decide what foods are served for meals and snacks, when they are served, and where they will be eaten. In turn, children should be responsible for how much to eat during a snack or meal and whether to eat what is offered. It has been useful to guide child-feeding practices (Loth et al. 2018). The authoritative approach is also the basis of books on what has been described as the French approach to bringing up children, including in relation to food, where it is applied not only in families but also in daycare settings and even schools (Druckerman 2012).

Social and Environmental Influences on Parenting Styles and Practices

Parents and caregivers want to do the best for their children. Yet they live in the context of communities, social structures and environments that may shape their parental feeding practices and styles (Patrick et al. 2013). Social and cultural influences such as parenting norms can shape parents' own parenting style and practices. For example, permissive parenting seems to be on the rise. Parents might consider permissive parenting to be the socially accepted style if they see other parents, whether friends or people in the media, using that style when interacting with children. Also, children's expectations about how their parents should interact with them might be influenced by how friends' parents behave with regard to setting rules or encouraging healthy choices.

The environment also presents challenges to parents' well-intentioned efforts to encourage healthy eating behaviors in their children. With schools near stores full of sugary drinks and high-sugar, high-fat food items at low cost, children may eat less healthful snacks after school, making children less enthusiastic about a healthy dinner. Given that parents have to see to other aspects of their children's lives such as homework and school activities, parents often feel that they can't fight every battle and so rules about eating often get set aside.

There are also time constraints: Today's parents work longer hours and most often both parents work outside the home. Many families consist of only one parent. Getting food on the table quickly becomes a priority and it is often hard to practice an authoritative parental feeding style under these circumstances. Additionally, given limited time, parents often say that they want quality time

with their children and they perceive that limiting junk foods and setting boundaries will lead to arguments and interfere with quality. And finally, parenting practices and child behavior are bi-directional—children also influence their parents' practices.

CHECK IN ON PRACTICE

The mother of a 3 year-old fussy eater who loves sweets and rejects many healthy foods such as vegetables attends a group session with other moms. She is relieved that they have similar problems with their young children. The nutrition educator leads them in a discussion of possible solutions based on evidence and best practices. What are some tips that the mothers might identify as effective to get their child to eat better?

SUMMARY OF THE INFLUENCE OF INDIVIDUAL EXPERIENCE WITH FOOD

Biologically determined behavioral propensities, physiological mechanisms, and social conditioning through experience with food all influence people's sensory experience of food and food preferences. These influences are summarized in **FIGURE 2-2**. While these influences are most prominent in children, they apply to adults as well.

Given that energy-dense, high-fat, high-sugar foods are widely available in the environment, they tend to be used as rewards, are most often offered in positive social contexts such as celebrations and holidays, are liked by other family members, satisfy biological predispositions, and produce positive feelings of being full, it is not surprising that they become highly preferred by adults and children alike. On the other hand, fewer opportunities are provided for people to learn to like whole grains, fruits, and vegetables in similar social contexts. When such opportunities are provided, children can develop a liking for healthy foods such as vegetables (Anzman-Frasca et al. 2012). Practices that encourage healthful eating include making healthful foods available and easily accessible, offering encouragement to try them, setting boundaries but providing choices among them, and using strategies designed to facilitate acceptance but that are not excessively firm and controlling.

Person-Related Determinants

Biology and personal experiences with food are not the only influences on individuals' food intake. Children tend to eat the foods they like and reject the foods they do not like in terms of taste, smell, or texture. However, as individuals become older, they also develop perceptions,

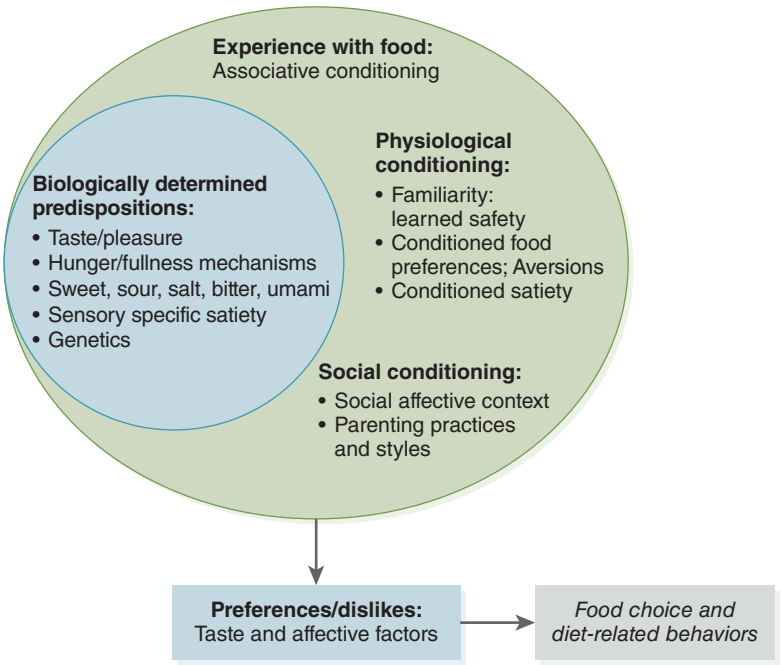

FIGURE 2-2 Our experiences with food influence our food choices and dietary behaviors.

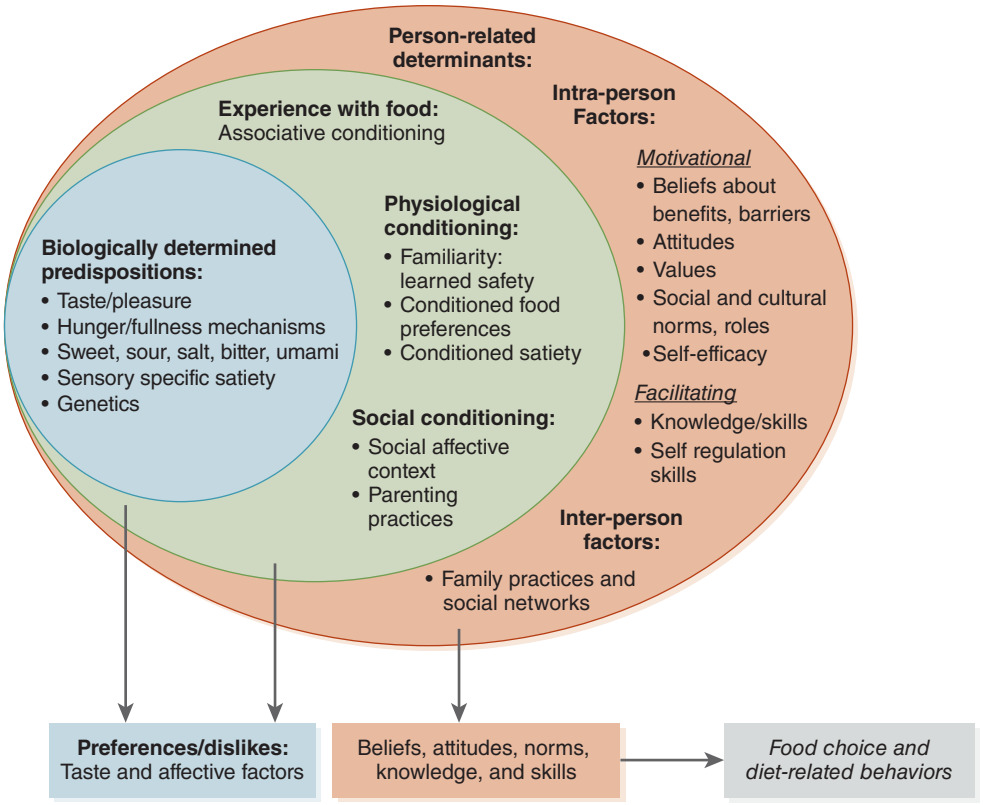

FIGURE 2-3 Intra- and interpersonal factors influence food choices and dietary behaviors.

expectations, and feelings about foods. These perceptions, attitudes, beliefs, values, emotions, and personal meanings are all powerful motivators of food choice and dietary behavior, as are individuals' interactions with others in their social environment. Additionally, people's knowledge and skills and their confidence to use these in context are also important, particularly when they want to make changes in their eating patterns or dietary behaviors. These influences, generally referred to as determinants, are explored below and are shown in **FIGURE 2-3**. They operate whether people are purchasing groceries at the store, choosing food when eating out, or making food at home.

INTRAPERSONAL DETERMINANTS

Motivating Determinants: Perceptions, Beliefs, and Attitudes

Our food choices and dietary practices are powerfully influenced by a variety of personal factors, such as our beliefs about what we will get from these choices. We want our foods to be tasty, convenient, affordable, filling, familiar, or comforting. We may also be motivated by how the food will contribute to how we look, such as whether it will be fattening or, in contrast, good for our complexion. Our food choices may be determined by the personal meanings we give to certain foods or practices, such as chicken soup when we are ill or chocolate when we feel self-indulgent. Our food- and nutrition-related behaviors are also determined by our attitudes toward them—for example, our attitudes toward breastfeeding or certain food safety practices.

Our identity in relation to food may also influence our behaviors. For example, some teenagers may see themselves as health conscious, but many others may see themselves as part of the junk-food-eating set. We may see that there are health benefits to eating more healthfully but may consider the barriers, such as high cost or the effort required to prepare the foods in healthful ways, just too great to take action. Or perhaps we lack confidence in preparing foods in ways that are tasty and healthful. Or again, we may have specific culturally related health beliefs that influence what we eat. For example, the concepts of balance and moderation are common among many cultures. Some individuals may come from cultures where foods are described as having hot and cold qualities and must be eaten in such a way as to balance

cold and hot body conditions. These cultural beliefs can have a major influence on food choices.

We come to value some aspects of food over others. In the United States, the major values in choosing foods are taste, cost convenience, (Food Marketing Institute 2012; IFIC 2019). In Europe, the major values are quality, nutritional value, price, and family/communal preferences (Rozin et al. 2011).

Our food choices may also reflect larger, more global values, such as sense of accomplishment, pleasure and enjoyment in life, independent and creative thought, power or social status, concern for the welfare of all people and nature, safety and security, and so forth (Rokeach 1973; Schwartz 1992). These more global values may exert their influence on dietary choices by influencing the more immediate values such as desired outcomes from these practices (Botonowski and Konstadonos, 2010; Arbit et al. 2017).

Food rejections are also highly influenced by psychological processes, based on both previous experience and beliefs. Rozin and Fallon (1987) place the motivations for rejecting foods into three main categories: (1) sensory-affective beliefs (e.g., the food will smell or taste bad) that lead to distaste; (2) anticipated consequences or beliefs about the possible harmful outcomes of eating certain foods (e.g., vomiting, disease, social disapproval), leading to danger; and (3) ideation or ideas about the origin or nature of foods, leading to disgust (e.g., eating insects).

Knowledge regarding all these numerous person-related factors is crucial for nutrition educators so that we can better understand and assist our audiences to eat more healthfully. Indeed, the next three chapters are devoted to the findings from the field of psychology to help us understand these person-related influences on eating behavior and how we can use such understandings in nutrition education.

The Process of Choosing Foods

Our food choices are based on an interaction of our thoughts and feelings with what we experience in the environment. For example, we may see a news story on the role of fruits and vegetables in reducing cancer risk, or a friend of ours develops colon cancer (external stimuli). We process such environmental stimuli or external events both cognitively and emotionally. These stimuli are filtered through a host of internal personal reactions of the kind listed previously, such as our perceptions, beliefs, values, expectations, or emotions, and together these filters determine what actions we will take. For example, we may process the idea of eating more fruits and vegetables in terms of taste, convenience, expected benefits, perceived barriers, or what our friends and relatives do, in addition to our concerns about getting cancer. Consequently, our decisions about whether to eat more fruits and vegetables to reduce cancer risk are based on our beliefs and knowledge about expected consequences (of eating fruits and vegetables), our motivations and values about desired consequences (reduced risk of cancer), and our personal meanings and values (with respect to developing cancer).

Balancing Motivations and Trade-Offs

In the food choice process, most times, we will also need to make trade-offs among various determinants or reasons for food choice, such as trade-offs among health considerations, taste, time to prepare food, family norms, and cultural expectations. For example, the primary family food preparer who works full time outside the home and has very little time may decide that the use of convenience foods in preparing meals means that at least the family can eat dinner together. People may also trade off between items within a meal or between meals. For example, individuals may choose an item for its fillingness (e.g., a donut) but then balance it with something perceived as more healthful (e.g., orange juice). Individuals may prepare or choose a "healthy" dinner to balance what they consider to have been a less-than-healthful lunch (Contento et al. 2006).

Social, Cultural, and Religious Norms

Humans are social creatures. We all live in a social and cultural context and experience society-wide social norms and cultural expectations, which can be extraordinarily powerful. We feel compelled to subscribe to these norms and expectations to varying degrees. For example, teenagers may feel pressure to eat less-nutritious fast food items in a choice situation with peers (e.g., after school), or individuals may experience family members' expectations that they will eat in a certain way. Whether to breastfeed may be influenced very much by the desires of a woman's family or her husband's family, depending on the culture. Being "large" has positive value in some societies. In the United States, there is a saying: "you can never be too rich or too thin," especially when it comes to women. But in some societies, "people share goods, so no one is too rich, and

friends share food, so no one is too thin" (Sobo 1997). Indeed, weight gain, good appetite, and large stature are signs of good health, good social relations, generosity, and many friends. Conversely, weight loss, a small appetite, and thinness are considered signs of poor health, poor social relations, lack of friends, and meanness (the person did not share food when the person had it and so now the person has no friends to share food with him or her) (Rittenbaugh 1982; Sobo 1997).

Our perceptions of our status and roles in our communities are also important. The food choices and eating patterns of celebrities create social expectations for us all. What others in our community think are appropriate foods to eat in various situations may also create social pressures. Thus, our choice of foods may be heavily influenced by our perceptions of the social and cultural expectations of those around us.

Facilitating Determinants: Knowledge and Skills

People's nutrition literacy or food-related knowledge and skills also influence what they eat. For example, a national survey found that about one-third of individuals thought that the recommended number of servings of fruit and vegetables per day was two or three, and only about 20% thought it was five (National Cancer Institute 2007). Many consumers have difficulty judging the amounts of fat and number of calories in many common foods and in their own diets or knowing what an appropriate serving size should be (Brug et al. 1997; Chandon and Wansink 2007). They may not be familiar with the recommendations of national dietary guidelines or how to apply the guidelines to choosing healthful diets. Health claims on product labels are hard to evaluate and the symbols used by different companies to indicate food ingredients in the package, such as fiber or sugar, are hard to decode. They are confused about how to achieve a healthy weight. In particular, given so much misinformation from a wide variety of sources, particularly online and in the lay press, they often have misguided eating patterns. Then of course, lack of skills in preparing healthful foods also influences what individuals eat.

INTERPERSONAL DETERMINANTS

Within societies, we all participate in a network of social relationships, the extensiveness and density of which vary among individuals (Israel and Rounds 1987). These networks involve family, peers, coworkers, and those in communities and various organizations to which we belong and influence what we eat (Wang et al. 2011). For example, in one study, food choices were 94% similar between spouses, 76–87% similar between adolescents and their parents and 19% similar between adolescents and their peers (Feunekes et al. 1998). Food choices and eating patterns are also influenced by the need to negotiate with others in the family about what to buy or eat (Connors et al. 2001; Contento et al. 2006, Larsen et al. 2015). Relationships with peers and those with whom we work also have an impact on our day-to-day choices (Devine et al. 2003).

Indeed, eating contexts and the management of social relationships in these numerous contexts play a major role in what people eat (Furst el al. 1996). For example, if a mother thinks it would be good for the whole family to reduce or eliminate sweetened beverages at meals, she may find resistance from her family who think of this as a meal ritual or cultural tradition. Or the teenage daughter who has decided to become a vegetarian may have special food requests and the family needs to decide whether to accommodate the requests.

In addition to the impact of needing to manage social relationships within social networks, social support for healthy eating is also important, especially for those with long-term health conditions such as hypertension or diabetes where following special eating patterns has to be maintained indefinitely (Rosland et al. 2008).

Social and Environmental Determinants

Social and environmental factors are powerful influences on food choice and nutrition-related behaviors and must be considered by nutrition educators in planning programs.

FOOD ENVIRONMENT

Foods available in any region were traditionally a product of its geography and ecology, history, and cultural traditions and they still generally form a basis of its staple foods. However, there has been considerable globalization of the food system, including technological advancement in the

processing of foods, affecting food availability, accessibility, convenience, and quality. The traditional foods often sit alongside the global. Nutrition educators need to be aware of these forces as they work with many diverse populations.

Food Availability, Accessibility, and Quality

Food availability may be described as the physical presence of sufficient quantities of food that are present in the food system through domestic production or imports, including food aid. *Food accessibility* refers to the access by individuals to adequate resources for acquiring appropriate foods for a nutritious diet. Accessibility also is dependent on where sources of food are physically located. Supermarkets, where a wide range of foods is available, may require transportation to reach, limiting the accessibility of food for many people, such as older people who are no longer able to drive or lower-income people without cars. The types of foods that are readily available in the local grocery stores, small corner stores, and restaurants within a given community depend on potential profits, consumer demand, and adequate storage and refrigeration facilities. The foods served or products stocked thus tend to be those that sell well, which are not always the most nutritious. Farmers' markets provide fresh, local foods but may require transportation to reach and are often only seasonal. Hence, some foods that are very important for health, such as fruits and vegetables, may not be readily accessible or are available only at a higher cost. *Food convenience* may be thought of as more immediate accessibility—whether the food requires little or no cooking and is packaged in a convenient way, and whether it can be stored for some time without spoilage. *Food quality* has many meanings, such as the characteristics of food that is acceptable to consumers. This includes such external factors as appearance, texture, and flavor and internal factors such as safety. It can also refer to whether the foods were produced in an environmentally sustainable manner and are wholesome (Gussow 2006). Availability and accessibility of such foods influences the quality and healthfulness of the overall diet. In high-income countries and increasingly in many others, foods and processed food products are available in an ever-widening array of choices. Technology has improved the packaging and distribution and thus the cleanliness, safety, and convenience of many foods. However, some 57% of the food products are now in the ultra-processed category in the United States with rapid increases in many other countries (Martinez Steele et al. 2017; Monteiro et al. 2013). These are often of low quality, being high in fat, salt, and sugar and often lacking in desirable nutrients and may have a high ecological footprint to produce and market.

Markets

Studies have shown that the availability of more healthful options in neighborhood grocery stores, such as fruits and vegetables or low-fat milk, is correlated with these foods being more available in homes, which, in turn, is related to a higher quality of people's food choices and intakes (Morland, Wing, and Diez Roux 2002; Powell et al. 2007; Boone-Heinonen et al. 2011). Thus, what is available in the community influences what is purchased and consumed. Many neighborhoods with low resources and people of color have fewer supermarket chains that have a wider range of foods with higher quality and cheaper prices. These are often termed "food deserts" to describe the lack of healthy foods at affordable prices in neighborhoods (Ver Ploeg et al. 2009; United States Department of Agriculture [USDA] 2017). Just as important, and maybe more so, is the notion of "food swamps" or the overabundance of fast food and less healthy foods in neighborhoods (Rose et al. 2009; Boone-Heinonen et al. 2011; Cooksey-Stowers et al. 2017). Certainly, youth report this as a major temptation to eat high-calorie food products and beverages and a barrier to healthful eating (Mallya et al. 2012, Burgermaster et al. 2018, Koch et al. 2019).

Workplaces, Schools, and Homes

Foods available at or near workplaces also tend to be those that are convenient, low in cost, and popular. In the United States, the National School Lunch Program provides meals that conform to federal guidelines that specify nutritional standards. Participation in the program declines with age so that by high school, two-thirds of students obtain their lunch from other sources. The majority of foods in these other venues have been found to be high-fat and high-sugar items, including snack chips, candy, and soft drinks. In some countries, commercial vendors provide meals for purchase at school. What is available around school environments may also affect the dietary behaviors of children

(Briefel et al. 2009; Smith et al. 2013; Williams et al. 2014). Within the home, accessibility means that clean and safe water is easy to reach, a vegetable is not just available in the refrigerator but is already cut up and ready to eat, or fruit has been washed and is sitting on a table, ready to eat. The limited accessibility of healthful, convenient foods in many settings may narrow good choices and make it difficult to eat healthfully.

Social and Cultural Environment

Social environments and cultural contexts are no less important than the physical environment. Social influences and cultural practices all influence food choice and dietary behavior (Rozin 1996).

Most eating occurs in social settings.

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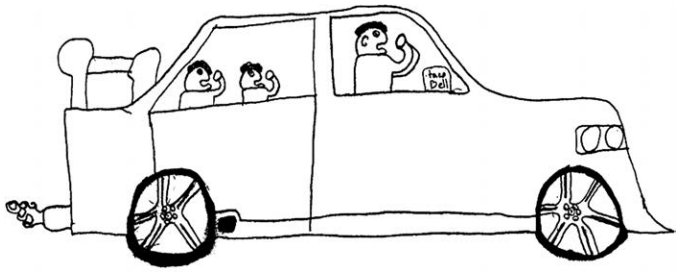
Social Settings

Most eating occurs in the presence of other people. The effect can be positive or negative in terms of healthful eating, in part because family and friends serve as models as well as sources of peer pressure. For example, there is evidence that eating with others can lead to eating more food compared with eating alone, especially when the others are familiar people (de Castro 2000; Salvy et al. 2009). Spending more time at a meal, eating with others also increases intake. Eating with others can result in pressure to eat higher-fat foods. On the other hand, eating with others can also result in pressure to try new foods that are healthy (MacIntosh 1996). Parents' own eating patterns likely influence those of their children (Patrick and Nicklas, 2005; Contento et al. 2006), and it has been shown that children and adolescents who eat with their families most days each week have better-quality diets than those who eat with their families less frequently (Gillman et al. 2000; Berge et al. 2013).

Cultural Practices and Family of Origin

Culture has been described as the knowledge, traditions, beliefs, values, and behavioral patterns that are developed, learned, shared, and transmitted by members of a group. It is a worldview that a group shares, and hence, it influences perceptions about food and health. Cultural practices and family of origin have an important impact on food choices and eating practices, even in modern, multiethnic societies where many different types of cuisine are available (Satia-Abouta et al. 2002; Kittler et al. 2017). Those from different regions of the country may have different practices. For example, for those from the American South, a home-style meal may be chicken-fried steak, mashed potatoes, corn bread, and bacon- and onion-laden green beans, with pie for dessert, whereas those who live in Texas may expect to eat barbecue or Tex-Mex foods that are hot and spicy. Those who have immigrated from different countries from around the world maintain some of their cultural practices in varying degrees, chief among them traditions that influence eating patterns. Religious practices also influence what is eaten.

Cultural rules often specify which foods are considered acceptable and preferable, and the amount and combination of various categories of foods that are appropriate for various occasions. The cultural practices of family and friends, especially at times of special celebrations and holidays, provide occasions to eat culturally or ethnically determined foods and reinforce the importance of these foods. If dietary recommendations based on health



This child was asked to draw a picture of her family eating their favorite meal together.

Courtesy of Cooking with Kids.

considerations conflict with family, cultural, and religious traditions, individuals who want to make dietary changes may find themselves having to think about and integrate their cultural expectations with their concern about their personal health. All of these considerations influence individuals' willingness and ability to make changes in their diets. These beliefs and practices must be carefully understood so that nutrition educators can become culturally competent and can design culturally sensitive nutrition education programs.

Social Structures and Policy

Society has been described as a group of people interacting in a common territory who have shared institutions, characteristic relationships, and a common culture. The organizations to which we belong within a society can have a profound effect on our eating patterns. Some are voluntary organizations, such as religious, social, or community organizations; others include schools, our places of work, and professional associations to which we belong. The influence of these organizations comes from their social norms as well as their policies and practices. Local, state, and national government policy can govern and determine the availability and accessibility of opportunities for healthy eating and active living.

ECONOMIC ENVIRONMENT

Many factors in the economic environment influence food choices and dietary practices, among them the price of food, income, time, and formal education. Nutrition educators must consider these factors when designing nutrition education programs.

Resources

People in the United States and United Kingdom spend only about 8–10% of their income on food, compared with 15% in Europe and Japan, 35% in middle-income countries, and 45–50% in low-income countries (USDA 2018; *Washington State Magazine* 2018). However, this is an average. The amount of money spent on food depends on the income level within a country. Upper-income individuals in the United States spend more money on food, but it is a smaller proportion of their income—about 8%. Lower-income households economize by buying discounted items and generic brands and thus spend less on food; despite this, food accounts for 30–35% of their income (USDA 2018). Compared with other economic variables, income has the strongest marginal impact (i.e., additional effect) on dietary behavior: those with higher incomes eat a higher-quality diet (Macino, Lin, and Ballenger 2004). Other material resources also influence diet—those below certain poverty levels in many countries qualify for government assistance—such as free or reduced-price meals for children at school, food coupons in some form, or direct cash aid (U.S. Department of Labor 2012). These may improve the quality of diets.

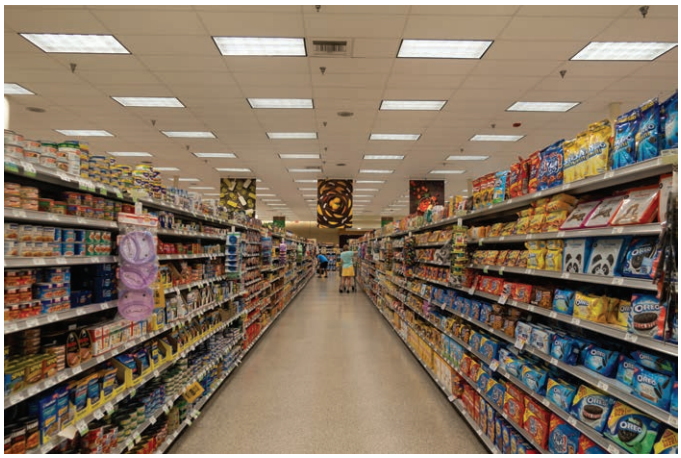
In this context, statistics show that about 12.3% of American households are food insecure, meaning that they have limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways. Within this category, about 4.9% are very food insecure (USDA 2016).

Price

Economic theory assumes that relative differences in prices can partially explain differences among individuals in terms of their food choices and dietary behaviors. The price of food as purchased is usually per item, by unit weight, or by volume. However, price can also be considered in terms of the amount of food energy obtained per dollar. Processed foods with added fats and sugar are cheaper to manufacture, transport, and store than are perishable meats, dairy products, and fresh produce. This is partly because sugar and fat on their own are both very inexpensive, which is in part a result of government agricultural policies. A diet made up of refined grains and processed foods with added sugar and fats can be quite inexpensive. Beans are also inexpensive but animal protein sources may cost 5 to 10 times more per calorie, and fruits and vegetables (except potatoes and bananas) can cost some 50 to 100 times more per calorie than high-fat, high-sugar, mass-produced food products (Drewnowski 2012). Not surprisingly, low-income individuals eat fewer fruits and vegetables.

Time Use

Surveys and time-use diaries show that the amount of time people spend on food-related activity in the home depends on many factors, including whether men or women are employed outside the home and whether they have children (Robinson and Godbey 1999). In the United States, about 70% of women and 45% of men are engaged in food preparation and cleanup activities each day and of those



Consumers are inundated with food choices at the supermarket.

who do, women spend an average of 8 hours per week and men 5 hours in these activities (U.S. Department of Labor 2018).

Time is scarce for all households, regardless of income. Many people with whom nutrition educators work today say they are too busy to prepare healthful foods or to cook at all. This is particularly true of low-income families who often work long hours. For some households, time constraints may limit personal investments in healthier behaviors. For example, it has been found that men and women who are married with children have a higher-quality diet than single parents, probably because they can share child care duties and thus are better able to attend to their own health (Macino, Lin, and Ballenger 2004). Nutrition educators need to consider these time constraints in the development of nutrition education interventions. However, it should be noted that Americans often spend an average of 20 hours per week watching television and another 5 hours per week on computer use for leisure (U.S. Department of Labor 2018).

INFORMATION ENVIRONMENT

Knowing the information context of the audience is important for nutrition educators to design messages and programs that are appropriate (see **BOX 2-1**).

Media

The current media-saturated environment has undergone revolutionary changes in the past 2 decades, resulting in the availability to individuals and households of numerous television channels, radio stations, websites, social media platforms, and other emerging communication routes. Time spent on these various media is high: children aged 2–4 years are exposed to about 4 hours per day of various media. This increases to 8 hours per day in middle school. Teens spend an average of 27 hours a week online, much of it on social media. The average adult spends about 10 hours a day on screen time, 1.2 hours on radio and only 0.2 hours with print. With multitasking, there is some overlap of media use (eMarketer 2017). About 30% of time online is spent on social media. TV is still important with people spending about 4 ½ hours per day on TV. These media are the main source of information about food and nutrition for many people, making them collectively a major source of informal nutrition education—and a good deal of misinformation. These media are supported almost entirely by advertising, so they are a major source of persuasive information as well. It also means that there is very little time left for physical activity.

Advertising and Priming

The media have demonstrated a powerful capacity to persuade. Today advertising occurs in a variety of venues such as magazines, the Internet, social media, and video games as well as television. The U.S. food industry spends close to $10 billion per year on food marketing and advertising (Federal Trade Commission [FTC] 2012), with $1.8 billion aimed at children. Most of this is spent by companies that produce high-fat and high-sugar products that are highly processed and packaged; examples include $800 million for snack foods, $3.5 billion for beverages, and more than $3 billion for restaurants/fast foods (FTC 2012). These figures probably do not include all the advertisements through various digital devices. Food advertising is strong in Europe and other countries as well (World Health Organization 2013). Information on the impact of marketing on sales of food products is not easily available because it is considered proprietary information. However, there is evidence that these marketing activities influence food choices (Story and French 2004; Institute of Medicine 2006). For example, advertising has an impact through its priming effect. That is, it triggers automatic responses to advertised food. One study found that children ate 45% more after a cartoon that contained food and adults ate more of both healthful and unhealthful snack foods after exposure to advertising (Harris et al. 2009). Another study found similar effects and that the effects were magnified when individuals are cognitively occupied by other tasks (Zimmerman and Shimoga 2014). The ubiquity of advertising, together with the amount of

BOX 2-1 Assessing Our Audiences: A Checklist

We can use the information in this chapter to assess our audiences in order to ensure that our nutrition education is appropriately tailored to them. It is best to have some specific behavior changes in mind for this assessment, such as eating vegetables, breastfeeding, or managing diabetes:

Food-related Determinants: Biology and Experience

- What are their favorite foods? Most disliked foods? Why?
- What are some comfort foods that they grew up with or are part of their culture? How important are these to them?
- How do they judge when they have had enough to eat?
- How willing are they to try new foods?

Person-related Determinants

- What does the term [healthy eating] [eating vegetables] [breastfeeding] [buying sustainably produced foods] mean to them?
- How important is [healthy eating] [eating vegetables] [breastfeeding] [buying sustainably produced foods] to them?
- What are some culturally expected behaviors in relation to diet (and physical activity)?
- What are some diet-related behaviors expected of them because of their role or status (e.g., mothers, managers)?
- How motivated are they to make the changes in their diets (or physical activity patterns) toward recommendations?
- What skills do they have to make the changes in their diets (or physical activity patterns) toward recommendations?
- What family or social networks do they have that would be supportive of the behavior (or physical activity) changes they wish to make?

Social and Environmental Determinants

- How easily can they get the foods they need from the stores near them? What kinds of stores are these (e.g., supermarkets, small stores, etc.)?
- How satisfied are they with the quality of these foods?
- What kinds of practices from their culture are supportive of the changes they would like to make? Which practices could be improved?
- To what extent are foods available at or near their places of work supportive of healthful eating? Are the policies at work supportive of breastfeeding?
- Do they feel they have enough healthful food to feed their families throughout the month?
- If their income is low, are they eligible for food assistance programs? Which ones? How helpful are these for making the behavior changes they would like to make?
- What media do they watch or use? How much time do they spend on these in a typical week?
- What are their major sources of information for food, nutrition, or physical activity?

These questions are the basis of the assessment described in Chapter 8

time people view various media and are exposed to marketing, makes these influences considerable.

Priming occurs in other ways as well: the very sight of food can trigger eating. Food is now present in pharmacies, gasoline stations, hardware stores, bookstores, and so forth, where its very presence triggers eating (Farley et al. 2009). Evidence suggests that such priming makes much of eating automatic (Cohen et al. 2008). The environmental influences on food choice and dietary behavior are summarized in **FIGURE 2-4**.

CHECK IN ON PRACTICE

People frequently state that they do not have time to prepare healthful food. Yet, data show that people in the US spend on average 12 hours a day on various media, including 20 hours a week watching television. How might you as a nutrition educator address this issue as you aim to help them to eat better?

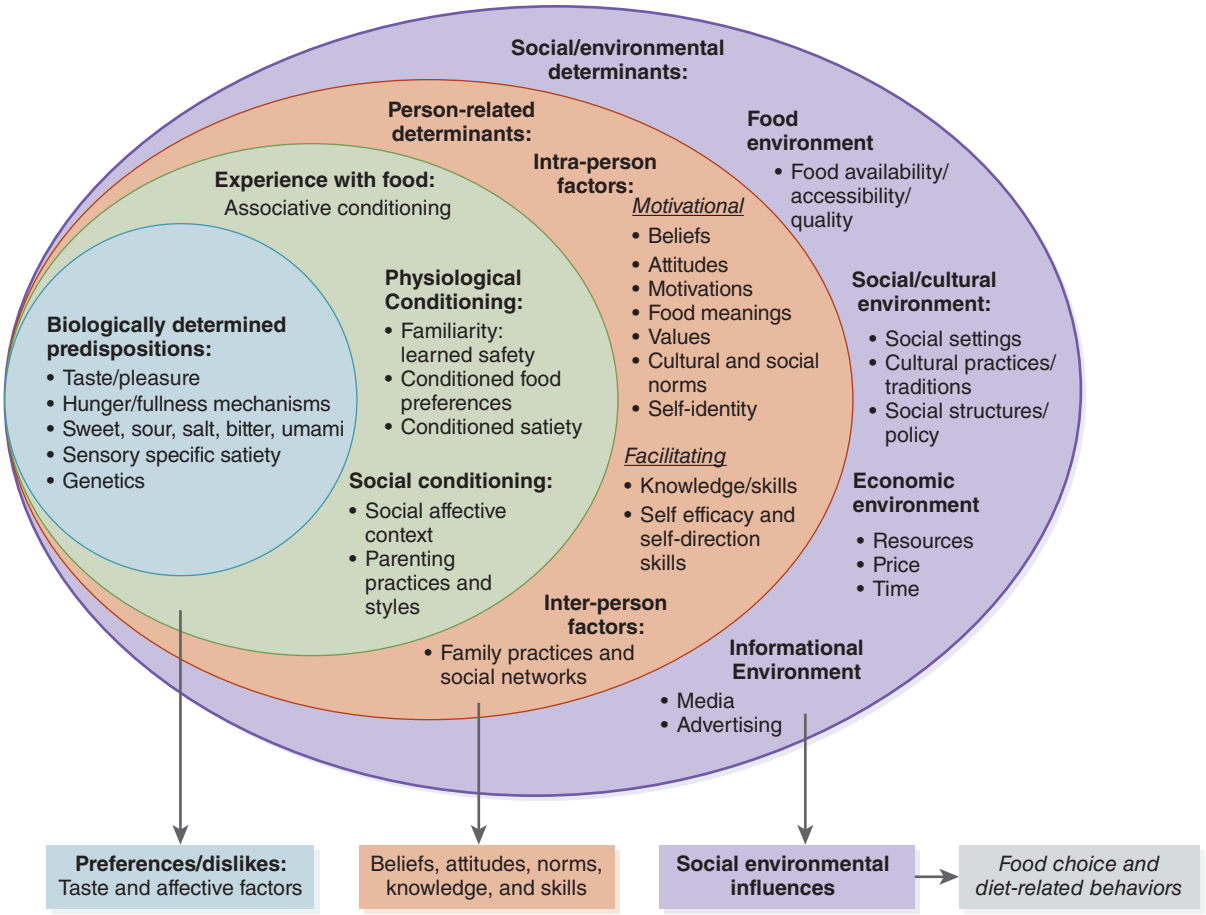


FIGURE 2-4 Social and environmental factors influence food choices and dietary behaviors.

What Does All This Mean for Nutrition Educators?

It is important for nutrition educators to realize that many factors influence eating behavior and that nutrition education needs to develop strategies to address these influences, generally referred to as modifiable *determinants* of behavior.

In Figure 2-4, a series of concentric circles schematically represents the ways in which biological, experiential, motivating and facilitating personal determinants, and social and environmental determinants influence food choice and diet-related practices. No factor is independent of any other; rather, they are all related, each larger circle encompassing the influences of the smaller circles. These concentric circles reflect levels of influence or overlapping spheres of influence. Nutrition educators can use this information to conduct assessments of our audiences as shown in Box 2-1. The information can also be used in the development of nutrition education programs, as described below.

KNOWLEDGE OR NUTRITION LITERACY IS NOT ENOUGH

Knowledge is needed for people to be able to make wise choices and to take action. But Figure 2-4 shows us that knowledge is only one of many, many influences on, or determinants of, food choice and diet-related behaviors.

Additionally, consumers in the United States often say they already know enough. For example, one survey found that 7 of 10 consumers said their diet needed some improvement. Guilt, worry, fear, helplessness, and anger were the primary emotions expressed about their diets. However, they said they knew enough about

nutrition: "Don't tell us more" (IFIC, 1999). Another survey found that about 23% said they actively seek out healthy foods when grocery shopping and another 56% said they did not seek out healthy foods but just tried to eat healthy in general, and the rest said health benefits were not a factor in their food choices (IFIC, 2019). Clearly, although many Americans say their diets need improvement, a majority are not actively interested in making changes. Thus, many other factors besides knowledge must influence or determine their food choices and diet-related behaviors. To be successful, nutrition education also must address these other determinants, which are discussed below in terms of motivating and facilitating factors within the three categories of food-related determinants; person-related determinants; and social and environmental determinants.

NUTRITION EDUCATION ADDRESSING FOOD-RELATED MOTIVATING AND FACILITATING DETERMINANTS

Addressing food-related determinants is very important in nutrition education. Food is a powerful primary reinforcer that produces instant gratification in taste and a sense of satisfaction and fullness. Because taste or preference is also shaped by repeated experience with foods and eating, nutrition educators working with any age group can enhance motivation by creating opportunities to offer nutritious and healthy foods such as fruits and vegetables frequently in a positive social-affective context so that individuals will come to like nutritious foods. Cooking and gardening experiences can be particularly helpful strategies for both motivating and facilitating change because they provide opportunities for people to become familiar with and enjoy healthful foods and to learn how to make healthy foods taste good. Similarly, interventions to decrease the intake of food components such as fat or salt should help people adopt eating plans that include foods naturally low in these components for a long enough time that people can become used to them and come to like them. Indeed, in a long-term nutrition education intervention with women, those who were able to stay with a low-fat diet for 2 years or more were those who came to dislike the taste of fat (Bowen et al. 1994).

As nutrition educators, we can also work with families and caregivers in preschool and school settings to assist them to adopt practices that encourage healthful eating, such as making healthful foods available and easily accessible, modeling the desired behavior, serving age-appropriate serving sizes, providing healthful options and allowing the child to choose among them, encouraging children to taste the desired foods, using rewards appropriately so children can acquire preferences for healthful food, moderately restricting unhealthful snack foods, using teachable moments, and giving flexible responses to individual differences shown by children. Most of these practices work with adults as well.

NUTRITION EDUCATION ADDRESSING PERSON-RELATED MOTIVATING AND FACILITATING DETERMINANTS

Although biological mechanisms and food-related experiences influence eating behaviors directly, psychological processes can be perhaps even more powerful. Individuals develop attitudes toward foods, values, feelings, beliefs, and personal meanings, and these personal determinants also influence food choices and eating patterns. In fact, it is clear that such factors play a central role as motivating determinants of food-related behaviors. As Epictetus said many hundreds of years ago, "We are troubled not so much by events themselves but by the views we take of them." (Epictetus 108). This is good news for nutrition educators because these perceptions, attitudes, and beliefs are to some extent modifiable using the understandings from the field of psychology—in particular, social psychology—and the methods from the field of education. Here the function of nutrition education is to enhance individuals' motivations by understanding *why to* take action or make changes.

Once individuals are motivated as to why to make changes, the function of nutrition education is to facilitate change by providing the food and nutrition knowledge and skills and behavior-related self-efficacy and self-direction skills they need for *how to* make changes. Nutrition educators can also build on understandings from social psychology about family dynamics and social networks to enhance social support for participants as they seek to make the dietary changes they have chosen. The next three chapters explore in detail the psychological foundation for understanding these perceptions, attitudes and social support factors and thus are not described in detail here.

NUTRITION EDUCATION ADDRESSING SOCIAL AND ENVIRONMENTAL DETERMINANTS

The social and environment determinants influence eating patterns both directly and indirectly, and through people's interpretations of these determinants. ***For the direct route***, nutrition educators can promote the increased availability, accessibility, and convenience of wholesome and healthful foods by working with partners and collaborators in schools, childcare sites, worksites, community centers, community gardens, or food retail venues and national organizations. Examples of activities include collaborating with schools to improve the foods offered for lunch or other meals, coordinating with community groups to incorporate healthful foods among the offerings provided at emergency food sites and other community-supported efforts, and working with retailers to better educate consumers about healthful eating (e.g., recipe cards, customer newsletters, etc.) and to emphasize nutritious food choices via product placement.

Using the direct route, nutrition educators can also ensure that their programs include the cultural practices and traditions and social networks and relationships of their intended audience. In collaboration with partners, nutrition educators can advocate for policies and systems to make additional resources available for the low-income audiences with whom they work. For example, they can partner with farmers and producers to provide free fruit and vegetables as snacks to students in low-resourced schools, or to provide vouchers for reduced prices on fruits and vegetables in farmers markets. They can also provide input on policy to bring in more grocery stores that stock high quality culturally familiar fruits and vegetables at affordable prices into the city or community. Nutrition educators can also work with others to influence the nature of the media and advertising directed to children.

Nutrition educators can also use an indirect route to address environmental determinants. The indirect route involves *unconscious* and *conscious processes* (Kremers et al. 2006). *Unconscious processes* operate through an automatic or "mindless" route in which the behaviors are automatically elicited by the environment through established environment-behavior links. For nutrition education, a behavioral economics approach has much to offer for taking advantage of unconscious processes. It is based on the recognition that many external cues such as where the foods are placed or how they look in various venues can have a major effect on the food selected and the amount consumed. Thus when sweetened drinks or snacks are located very visibly in a convenience store, or dessert is the first item offered in a cafeteria line, or the salad bar in a school cafeteria looks unattractive, these features influence purchase and thus consumption. Adjusting these factors can have a major impact on what and how much is eaten for a meal or snack. Nutrition educators can take advantage of this observation by implementing changes to make the healthier options more attractive, convenient, and normative, which can nudge people to eat the healthier options (Hanks, Just, and Wansink 2013; Wansink et al. 2012). Similarly, when the high school cafeteria is restructured so that the seating arrangements and food service methods resemble those of the commercial venues teens frequent, more of them participate in school lunch and they choose healthier options (Koch et al. 2019). Nutrition educators can also use an indirect route that focuses on *conscious processes* by addressing people's perceptions and attitudes in relation to the environment, which also influence food choices and dietary behavior.

Beliefs and Attitudes About Availability

Accessibility means different things to different people. Recent immigrants may consider familiar food products "accessible" even if a long car or subway ride is needed to get to stores where these foods are stocked. For others, a food is not accessible if it cannot be cooked in the microwave and ready to eat in 5 minutes. Such differences in the interpretation of accessibility influence individuals' food choices and need to be considered in nutrition education.

Beliefs and Attitudes About the Economic Environment

Likewise, the economic environment is based on the analyses, values, and interpretations of individuals, all of which have an impact on dietary choices. Economics is a behavioral science based on the fundamental notion that human wants are infinitely expansible, whereas the means to satisfy them are finite. Human wants always exceed the means to satisfy them, and there is, therefore, scarcity. Economics is the study of people's reaction to the fact of scarcity—how people make choices when they must choose among alternatives to satisfy their wants. Cost can be seen as the sacrifice, or what needs to be exchanged, to obtain what is desired. In this context,

the full price of a food or dietary practice is not just its monetary price but includes all the costs or sacrifices individuals make, such as travel costs for shopping, time to prepare food, or child-care costs while attending a nutrition education session. For example, how willing are people to sacrifice convenience for more healthful meals? As nutrition educators, we need to learn about the sacrifices individuals are willing to make in order to engage in a healthy behavior and build these considerations into our programs.

Beliefs and Attitudes About Time

In the same way, time is both an objective feature of life and a perception. The time for food-related tasks such as cooking or eating can be easily quantified in hours and minutes. However, the *perception* of time and its worth to individuals for different tasks varies considerably and varies by other necessities of life. For example, for some preparing a home-cooked meal is not perceived as time-consuming, and is indeed fulfilling and enjoyable. Others may prefer to spend the time on other activities and are willing to exchange money for time by purchasing a food that is already prepared. For many, however, there is the economic necessity of two jobs and it is not surprising that the perception is that there is not just scarcity of time, but a time famine. This has impacts that are important for nutrition educators. For example, low-wage employed parents find there is spillover from working long hours into family food-related tasks (Devine et al. 2006): there is stress and fatigue; parents reduce the time and effort spent on family meals, they make trade-offs with other family needs, and they have to develop various time management strategies to cope. Nutrition educators need to be mindful of people's real and perceived economic and time constraints and how they make choices in light of these constraints.

NUTRITION EDUCATION IN ACTION 2-1 showcases programs that were created to work with economic and time constraints, and to use behavioral economics to help people eat better.

Summary: Nutrition Education Addresses Many Determinants of Behavior

People's biological predispositions and experience with food, and their social and physical environment influence their food choices and dietary behaviors not only directly but also through their impact on people's beliefs and attitudes. Consequently people's beliefs and attitudes form a central focus of much of nutrition education. Nutrition education can be seen as the process of addressing all the major categories of determinants, as shown in **FIGURE 2-5**. Building on the contemporary definition of nutrition education, Figure 2-5 shows that nutrition education is directed at:

- *Motivating and facilitating determinants related to biology and food experiences* by providing direct experiences with food, such as food tastings, cooking or gardening, to increase the familiarity and preferences for healthy foods.
- *Motivating and facilitating determinants related to person-related factors* by providing audiences with educational experiences on *why-to* take action on healthy food choices and diet-related behaviors (through addressing people's beliefs, attitudes, cultural and social norms, or personal and global values) and *how-to* take action (through addressing people's food and nutrition related knowledge and skills, and behavior-related self-efficacy and self-direction skills).
- *Social/environmental determinants* by providing environmental supports for behavior change through facilitating specific opportunities for *when* and *where* to take action on healthy choices in the food, social, and policy and systems environments.

Exactly how nutrition education activities can address these determinants of food choice and dietary behaviors is described in detail in the remaining chapters in this book.

CHECK IN ON PRACTICE

A nutrition educator /dietitian works in an urban health center in a low-resources community with numerous fast food restaurants, advertisements for sweetened drinks, and convenience stores with high calorie snacks. She asks the group she works with to identify what might be some key hidden, unconscious messages from this environment as to what is normal to eat and drink. List what the group might come up with. How might the nutrition educator help the group to build their desire and confidence to eat more healthfully, despite the obstacles?

NUTRITION EDUCATION IN ACTION 2-1: Programs to Address Economic and Time Restraints

Dietitians in Supermarkets

While most people may see a physician twice per year, many are more likely to go to the supermarket two or more times per week. Given many people's time constraints, a supermarket dietitian can thus become as valuable to a family's health as its health care provider. This is because healthful eating is key to warding off many diseases, and many health conditions require special diets. The supermarket dietitian can help shoppers make the best choices for these special needs as well for families more generally. Consequently, many supermarket chains are now employing dietitians in their stores. These nutrition professionals provide supermarket tours, cooking demonstrations, or health screenings to check serum cholesterol and glucose levels. They develop materials and maintain the store's website on health matters. Additionally, many provide more in-depth services such as classes on weight management or diabetes management, and personalized meal-planning.

People at Work: 5-a-Day Tailgate Sessions

Because many people working in factories and other similar locations do not have time to go to a different site for nutrition education sessions, the nutrition educator can go to them. At one sawmill, the workers ate their lunches from coolers in their cars. The nutrition educator therefore met them in the parking lot and provided monthly tailgate sessions over the course of a year (including through the Midwestern winter), providing a different food each time that involved interesting ways to use fruits and vegetables (such as baked apples, chili, or vegetable wraps). The focus was on how to incorporate fruits and vegetables into meals and snacks. The results showed that the workers' interest and motivation were enhanced, as were skills in incorporating more fruits and vegetables in their diets.

Smarter Lunchroom is a Trademark of the Cornell Center for Behavioral Economics in Child Nutrition Programs. Used by permission.

Smarter Lunchrooms Movement in U.S. Schools

Children in the United States are usually served lunches in school, with reduced price and free meals available for those with low incomes. External cues can have a major effect on the food selected and the amount consumed. Adjusting these factors can have a major impact on how much is eaten for a meal or snack. In a behavioral economics approach, changes are made to these environmental factors to nudge children to eat the healthier options. For example, making items more *attractive* by changing the names, such as "X-ray Vision Carrots" and displaying fresh fruit attractively in bowls or baskets increases consumption. When healthful items are made more *convenient* by placing them in the front of the food line, students will choose them more often (Wansink et al. 2012; Hanks, Just, and Wansink 2013).

http://smarterlunchrooms.org

Implications for Competencies and Skills Needed by Nutrition Educators

Nutritionists and dietitians are well grounded in nutrition science and medical nutrition therapy and are anxious to transmit what they know to a variety of audiences in exciting ways. They are less well grounded in the social sciences, particularly psychology, and the fields of education and communications. Yet as we see in this chapter, food choices and dietary behaviors are determined by a multitude of factors. Understanding behavior and its context is crucial for effective nutrition education. Additionally, as described in Chapter 1, nutrition education also requires knowledge from the field of education in order to design effective strategies of behavior change, whether delivered directly or indirectly. Finally, effective communication skills are essential.

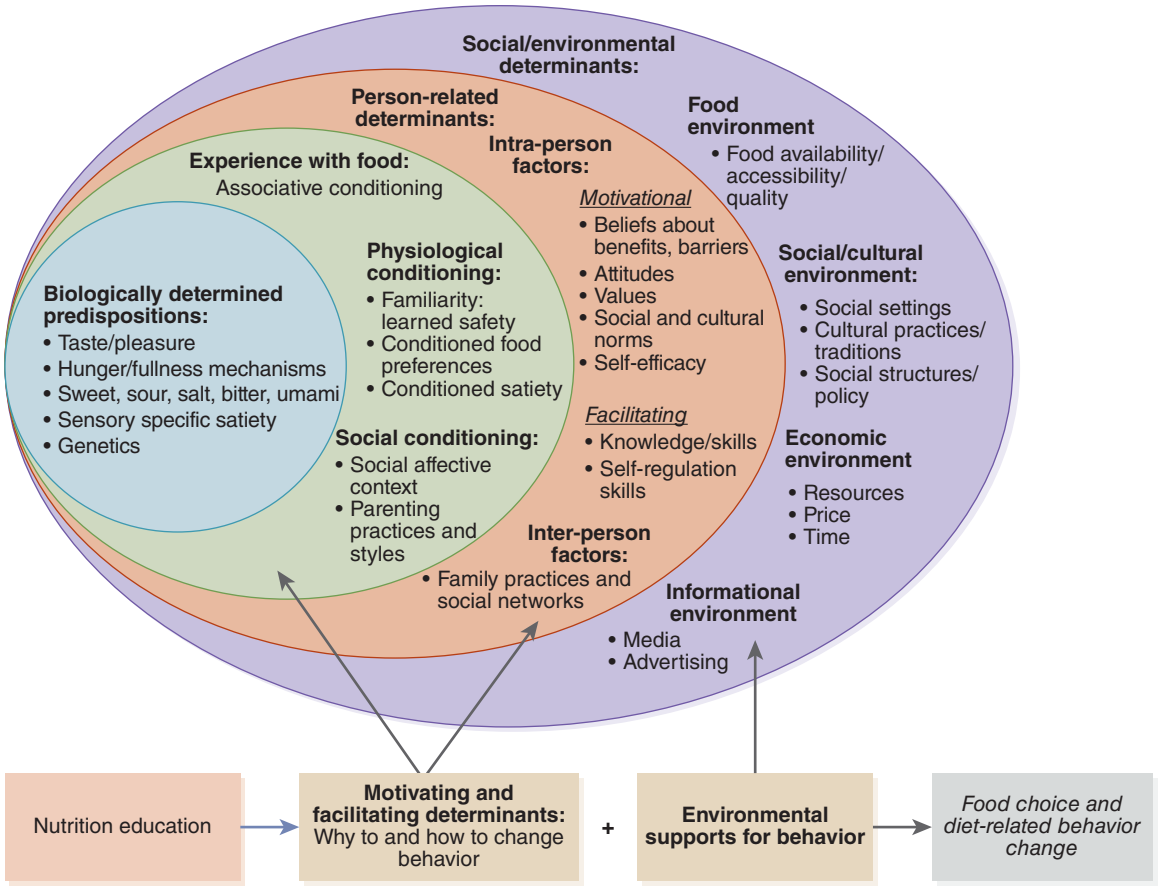


FIGURE 2-5 Nutrition education addresses the many determinants of behavior.

Consequently, what the field needs is nutrition educators who have a strong background in nutrition science and who are sufficiently conversant with the relevant fields of psychology, education, and communications to be able to design effective nutrition education programs as shown in **FIGURE 2-6**. This book aims to help nutritionists develop these competencies.

THE SOCIETY FOR NUTRITION EDUCATION AND BEHAVIOR'S COMPETENCIES FOR NUTRITION EDUCATORS

The Society for Nutrition Education and Behavior has developed a list of competencies that nutrition educators should have (SNEB 2016). These reflect the need for competencies in the broad range of disciplines listed above and are summarized below.

1. *Basic food and nutrition knowledge:* Describe the fundamentals of nutrition science, food groups and the dietary guidelines; describe prevention and management approaches for major diet-related public health issues; explain different types of nutrition-related study designs; and critically evaluate nutrition-related claims.
2. *Food science:* Describe the functions of food ingredients and basic types of culinary practices; identify the effects of food processing; describe best practices to address safe food handling; and explain how to plan, select, prepare, and, manage foods to enhance

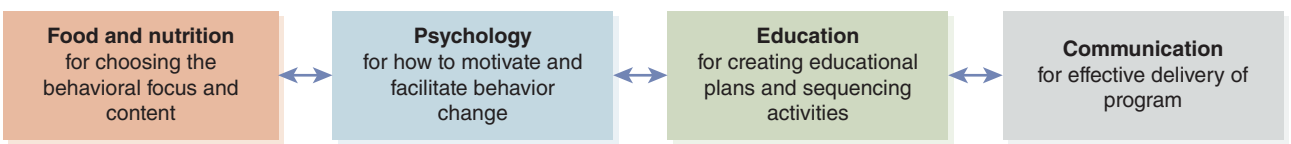


FIGURE 2-6 Nutrition educators need competencies in many fields.

the well-being of individuals, families, communities, and the food system.

3. *Nutrition across the life cycle:* Identify the primary dietary issues and challenges at different phases of the life cycle and use dietary guidelines to make recommendations.
4. *Physical activity:* Describe national and international physical activity guidelines; describe the benefits of physical activity and identify physical activity opportunities in daily living.
5. *Food and nutrition policy:* Describe the purpose, funding and implementation of various government food-related programs to address malnutrition and food security and to promote health; the roles of government agencies in regulating food systems, the food supply and dietary supplements; describe ways to collaborate to create communities and settings where healthy foods are easy, affordable, and desired while unhealthy foods are less prominent and desired.
6. *Agricultural production and food systems:* Describe the potential effects of differences in agricultural practices and various food processing, packaging, distribution, and marketing practices on food choices and food availability; explain effects of natural resources on the quantity and quality of the food and water supply; and, describe ways to collaborate to promote policies supporting systems that produce healthy food.
7. *Behavior and education theory:* Describe the biological, psychological, social, cultural, political, and economic determinants of eating behavior; psychosocial theories of behavior and behavior change and apply them to eating behavior and behavior change; and, apply theory-based learning and instruction practices in nutrition education
8. *Nutrition education program design, implementation, and evaluation:* Assess population to design nutrition education for all ages and diverse audiences using the following steps: determine the behavior change goals of the program; identify theory-based motivators and facilitators of behavior change using a participatory approach, including social and environmental influences; select appropriate theoretical models or frameworks; determine objectives to address determinants in the model; select or design appropriate strategies/techniques for diverse audiences; apply participatory approaches; develop a timeline and budget; and, design process and outcome evaluations and assess progress, and revising program as needed.
9. *Written, oral, and social media communication:* Communicate effectively with diverse audiences in written, visual, and oral form; use simple, clear and motivational language; facilitate communication among clients/participants; and, advocate effectively for nutrition education and healthy diets in various sectors and settings
10. *Nutrition education research methods:* Analyze, evaluate, and interpret nutrition education research and apply it to practice.

ACADEMY OF NUTRITION AND DIETETICS COMPETENCIES

The Academy of Nutrition and Dietetics' accreditation standards for the education of entry-level dietitians (Academy of Nutrition and Dietetics 2018) include some competencies that are related to nutrition education.

Core Knowledge for the Registered Dietitian

Upon completion of the program, graduates are able to:

- Demonstrate effective and professional oral and written communication and documentation.
- The curriculum must include the role of environment, food, nutrition, and lifestyle choices in health promotion and disease prevention.
- Demonstrate an understanding of cultural competency/sensitivity.
- Develop an educational session or program/educational strategy for a target population.
- Demonstrate counseling and education methods to facilitate behavior change and enhance wellness for diverse individuals and groups.
- Learning activities must use a variety of educational approaches necessary for delivery of curriculum content to meet learner needs and to facilitate learning objectives.

- The behavioral and social science foundation of the dietetics profession must be evident in the curriculum. Course content must include cultural competence and human diversity; human behavior, psychology, sociology, or anthropology.

Chapter Summary

People's food choices and nutrition-related practices are determined by many factors. This has consequences for nutrition education.

BIOLOGY AND PERSONAL EXPERIENCE WITH FOOD

Humans are born with biological predispositions toward liking the sweet, salty, and umami tastes and rejecting sour and bitter tastes. Some genetic differences exist between individuals in sensitivity to tastes, and these may influence food choices. However, individuals' preferences for specific foods and food acceptance patterns are largely learned from familiarity with these foods. People's liking for foods thus can be modified by repeated exposure to them. Sense of fullness is also learned.

Nutrition education applications:

- Check out the food preferences and prior experiences with food when you work with an audience.
- In nutrition education, address food-related motivating and facilitating determinants by providing food experiences and other activities to increase preference for healthy food.

PERSON-RELATED DETERMINANTS

People acquire knowledge and develop beliefs, expectations, and feelings about foods. These perceptions, attitudes, beliefs, personal meanings, values, and perceived cultural norms are all powerful determinants of food choice and dietary behavior. Families, social networks, and cultural groups also influence food choices.

- Conduct a thorough assessment of your audience before you design any nutrition education in terms of their beliefs, attitudes, values, cultural group membership, social networks, and food and nutrition-related knowledge and skills. Check out your own cultural competence.
- Use the information to develop nutrition education that addresses person-related motivating and facilitating determinants of dietary change.

SOCIAL/ENVIRONMENTAL DETERMINANTS

The physical/built environment influences the foods that are available and accessible as well as venues for active living such as walkable streets and attractive parks. Social settings, cultural practices, social structures, and policies related to food choices make it easier or harder to be healthy. The economic determinants of behavior include the price of food and time. The information environment, including the media, is very powerful in influencing people's food choices.

- Understand fully the physical, social, economic, and cultural settings of your audience and their information environment so that the behavior change recommendations you provide are appropriate.

KNOWLEDGE AND SKILLS ARE NOT ENOUGH

Consequently, knowledge and skills are not enough for people to eat healthfully and live actively. Nutrition education must address these many other food, person, and environmental determinants of behavior if it is to be effective.

- Check that your sessions or intervention includes activities that address motivation as well as knowledge and skills and takes into account other influences on behavior.

CONSEQUENCES FOR THE SKILLS OF NUTRITION EDUCATORS

These considerations make it clear that nutrition educators need an additional set of skills beyond our knowledge of food and nutrition. We need to develop the skills to understand people, their behavior, and the context of their behavior in order to create programs to address these factors.

- Review your knowledge and skills as an educator and check what skills you still need to enhance.

Questions and Activities

1. Think about the key influences on your eating and physical activity behaviors and list them. Compare them to the categories of influences described in this chapter. Into which categories do the items on your list fall? Are there some surprises? How would you describe the motivations for your eating patterns?
2. List at least five biological predispositions people are born with and describe each in a sentence or so. Are they modifiable? If so, provide the evidence. How can the information be useful to nutrition educators?
3. One often hears parents say that their child will just not eat certain healthful foods such as vegetables. They believe that such dislikes cannot be changed. Based on the evidence, what would you say to such a parent?
4. How can nutrition educators help young children learn to self-regulate the amount of food they eat?
5. Influences on dietary behavior arising from within the person have been stated to be central to his or her food choices and dietary practices. Why is this so? Describe three of these influences in a sentence or two, and indicate why they are so important. How might understandings of these personal factors help people make dietary changes?
6. People live within social networks and may experience cultural expectations about how and what they eat. Because these can't be changed by nutrition education, why should nutrition educators be interested in such information about their intended audience?
7. Distinguish between food availability, accessibility and quality. How can they influence food choice? How might nutrition educators address these issues?
8. Describe four environmental factors that influence people's food choices and dietary practices. What can nutrition educators do with such information?
9. As stated in this chapter, in terms of healthy eating and active living, "knowledge is not enough." In your view, is that true? Why do you say so? Give evidence for your view.
10. In reviewing the competencies suggested by the Society for Nutrition Education and Behavior for a nutrition educator, which competencies do you believe that you already possess? Which ones would you like to develop further? Keep these in mind as you read the remainder of this book.

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