FOOD AVersions AND PREFERENCES. The first food of the human omnivore, as a mammal, is a steady diet of blood delivered by the placenta. At the first great life transition, birth, the diet switches abruptly to a steady diet of milk. This second single diet leads to the consumption of a very large variety of foods in a second major life transition, weaning. During and after weaning, the foods and food traditions of the culture become established in the child. The challenge of weaning is great: it is both the introduction of new foods and, in most traditional cultures and in human prehistory, the abandonment of milk as a food. Before the institution of dairying, humans, like all other mammals, had no access to milk or milk products after weaning. A strong attachment to milk, as a complete food, accompanied by the powerful bonds produced by nursing, can be problematic. There is a wide variety of practices used across cultures to accomplish weaning. One general feature of mammalian helps; since the great majority of humans cannot digest milk sugar (lactose) after the nursing period (lactose intolerance), the consumption of milk after weaning can actually cause unpleasant symptoms.

Gradually, in the period from weaning to adulthood, and especially in the first 10 or so years of life, the adult feeding system takes hold. There are three important aspects: the regulation of food intake (when to eat and when to stop), the learning of food-related cultural rules and traditions (e.g., table manners, what foods are combined with which others, when one eats, and linkages between particular times, such as breakfast or feasts, and particular foods), and the learning of what to eat and what not to eat, or food preferences and aversions. It is the latter that is the focus of this article.

One of the biggest problems for any omnivorous (or generalist) animal is to distinguish between the edible and the inedible. This is often very difficult, because sensory properties alone will not provide sufficient information. A nutritive food containing harmful microorganisms or toxins should be rejected, as should a nonnutritive food, whatever its sensory properties. How generalist animals learn this vital distinction is unknown; for human beings, much of the required information is culturally transmitted and so does not depend on the direct experience of food by the child.

For adults, at the end point of development, all potential edibles, which means practically everything that can fit in the mouth, are divided into those that are accepted (preferences) and those that are avoided (aversions). Within each category, four subcategories can be distinguished. Certain foods are accepted or rejected on the basis of their sensory properties. These include distastes such as beer, chili pepper, or spinach for some individuals and good tastes such as many sweet and fat foods. Other foods are accepted because of the positive consequences of ingesting them (beneficials, "good for you," like vegetables and whole wheat bread, for some Americans) or rejected because of the negative consequences (dangers, like mercury-tainted food, or meat, for some Americans). Then there are many potential foods that are rejected because the culture in question characterizes them as not food, such as grass or sand. It is not either their sensory properties nor the consequences of eating them that determines rejection; they are just inappropriate. Finally, there are potential foods that are rejected because they are offensive (disgusts), having to do with their nature or origin. Almost all disgusts, crossculturally, are of animal origin. A much smaller category of transvalued foods is accepted and enhanced in value because of the foods' nature or origin, such as the wafer in the Catholic Mass or food shared with the Gods (prasad) in Hindu India.

It is unknown, in detail, how children master this taxonomy. Much of it is transmitted culturally, and, at the outset, it is sensory properties that determine choice. Sweet and fatty textures seem to be innately positive, and bitter and irritant properties and other strong tastes, innately negative. If one gets sick to the stomach after eating a food, it tends to become a distaste (i.e., it comes to taste bad), whereas if negative consequences do not involve the gastrointestinal system, it becomes a danger. For example, if one eats a new dish and gets sick to one's stomach within a few hours, one tends to now find that food distasteful. But if the consequences of eating the same food are skin rashes, shortness of breath, headaches, or visceral pain, the liking for the food tends not to be affected, but it becomes rejected as a dangerous food.

A critical distinction that arises in considering these categories is that some potential foods are accepted or rejected because people like or dislike them (e.g., good tastes and distastes and disgusts), and others are accepted or rejected because of their known effects, what might be called instrumental reasons (like dangers and beneficials). It is easy to understand why people do not eat wild mushrooms, having heard that many are toxic. But it is not fully clear how foods come to be liked or disliked.

Infants will put anything into the mouth that can fit. If the sensory properties are appealing, ingestion occurs, and if not, there is rejection. Infants are protected from eating harmful things because of close monitoring by parents. For infants and young children, sensory factors dominate. Furthermore, culinary rules are not yet present. If a child likes X (say, milk) and Y (say, string beans), the child will like X + Y. At least in the United States and Canada, the source of the data, it is very common for young children, in the 2- to 5-year age range, to reject almost all foods and develop a very narrow range of edible foods, a phenomenon referred to as food neophobia. It is not known if this neophobic
phase is a normal part of development or just appears in certain Western cultures.

Given that the human, as a mammal, consumes milk as an exclusive food for the first months or more after birth and that milk was unavailable after weaning for almost all of human history, it would be maladaptive to have strong lifelong attachments (imprinting) develop to early foods. There is no evidence in favor of the popular view that the foods of the first three or even six years of life have an especially important role in shaping adult preferences. The second six years of life (where, in many cultures, there is much more interaction with peers) may be just as important.

It is not known in any detail how preferences and aversions are acquired. The most important process seems to be more exposure. Exposure to a food (or anything else), within limits, tends to increase liking. There are also conditioning processes, called evaluative conditioning, such that pairing of a new food with other positive events (e.g., already-liked tastes, admired persons, feeling good or bad) can affect liking. However, such contingencies only work under conditions that cannot yet be described. Finally, social influence effects are powerful. Coming to recognize that a food is liked or disliked by peers or admired others can appropriately affect the acceptability of a food. There is a special category of likes in humans for innately unpalatable foods, like chili pepper or coffee or other bitter and irritant foods. There may be some special mechanisms of acquisition for these foods.

Another approach to understanding individual differences in preference is to attribute them to general innate biases or genetically based individual differences rather than early experience in the context of the family or later experience and influences such as peers and media. Parent-child resemblance in food choice could result from either genetic factors and/or the effects of early experience, which are dominated by the parents. It is sobering to note that results from a number of studies indicate that, within culture, children’s preferences (whether young or adult) are not very similar to those of their parents. Parent-child correlations average in the 0.15 to 0.20 range. This suggests that influences after early childhood, as in school and in peer interactions, may be the major source of variation in food preferences and aversions, but all of this data comes from a few Western-developed cultures.

Family meal interactions have been the focus of some research. This research has been directed at understanding both the development of individually unique preferences as well as those that are culturewide. A particular focus has been parenting styles.

As already indicated, because of low parent-child food preference correlations, family effects cannot be the principal determinants of food preferences. However, they have some effect and are the best-studied aspects of preference acquisition. In the development of food preferences, parents and siblings serve as role models for the sampling of novel foods. Parents’ liking of specific foods increases their child’s liking of that food. Exposure to novel foods and their observation of a family member eating an unknown food decrease neophobia and enhance liking of these foods in children. Parents who involve their child in the preparation of meals and expose them to a wide variety of flavors enhance the willingness of the child to sample new foods.

Children eat more in emotionally positive atmospheres. Forcing a child to eat a disliked food, on the other hand, further decreases liking for that food. Many parenting styles involve the use of rewards and punishments for eating. Rewarding the consumption of a disliked food with a liked food seems only to increase liking for the reward and not the disliked food. Restriction of access to foods may increase the child’s preference for those foods.

More generally, an authoritative parenting style, which uses supportive rather than punitive disciplinary methods, has been found to be associated with increased parental responsiveness to the child’s eating cues and behaviors as well as a higher intake of vegetables and dairy in children. Authoritarian parents who are characterized as directive and demanding, but not responsive, are known to be less likely to make fruits and vegetables available in their home. As a result, children raised in an authoritarian environment are less likely to consume these foods. Authoritarian parents are more likely to raise overweight and obese children than authoritative parents.

The influence of parenting styles on children’s food preferences has only been studied in Western cultures. Little is known about how far one can generalize these findings to other cultures. Even among Western cultures, important differences have emerged in the parenting styles employed to socialize children to food. For example, parents in the United States tend to introduce their children to foods through the use of negotiation, rewards, and punishments and to emphasize nutritional properties of foods. Italian children, on the other hand, are taught to pay attention to the sensory and pleasurable properties of food and are encouraged to develop their individual tastes.

Food is basic for survival and one of the major sources of pleasure for humans. In the modern Western world, the ancestral food environment has been essentially reversed: Calorie-dense and very tasty foods are plentiful and available with little expenditure of effort. Innate taste biases to prefer calorie-dense foods (e.g., the sweet and fat preference) and child-rearing practices have been shaped in a food-scarce environment, in which there were also acute dangers of eating toxic foods. There is now a mismatch between both humans’ biological biases and cultural practices and the environment that has been created in the modern Western world. Meat, a highly favored food in most traditional cultures, is now viewed by many with ambivalent feelings, and there seems to be a rise in vegetarianism in the
Western world. Widespread dieting, concerns about eating, obesity, and eating disorders are on the rise.

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SEE ALSO: Eating and Nutrition; Eating Disorders; Feeding, Infant; Malnutrition and Undernutrition; Obesity and Dieting; Taste and Smell. Development of


FOREIGN LANGUAGE EDUCATION. The acquisition of more than one language provides the opportunity to access alternative information and connect with individuals from diverse backgrounds and, consequently, is an act of cross-cultural solidarity and a way to recognize people's humanity. Researchers also have discovered that the acquisition and maintenance of additional languages can further cognitive and emotional development, creativity, and more diverse thinking. National tests in the United States also suggest that foreign language learners excel in oral and written linguistic and mathematical skills. Practical, educational, and cognitive advantages and military or economic motives and the possibility of increasing mutual human understanding and respect are motivations for foreign language education.

Given the benefits, what opportunities exist for foreign language education in the United States as compared to other countries? Foreign language education is a priority in many parts of the world, such as the European Union, Canada, Japan, Morocco, Kazakhstan, Thailand, Cuba, and India, where it is compulsory and an integral part of public school curricula. These countries require at least one, and often two or three, foreign languages beginning in elementary school. Furthermore, they have made it a national policy to foster immersion and other communicative methods, maintain nonofficial languages, and support innovative teacher-training programs.

Most public schools in the United States, on the other hand, consider foreign language education peripheral to math, language arts, social studies, and science and offer no foreign language courses until the eighth grade. Although increasing in secondary schools in the 1990s, foreign language education has declined as a result of the No Child Left Behind Act, signed into law in January 2002, especially in high-minority schools. And only 16% of four-year institutions of higher education require foreign language study.

In the United States, socioeconomically advantaged individuals are the most inclined and able to access foreign language education opportunities in academics and private or elite elementary and secondary schools that include "two-way" bilingual and immersion programs like those found in other countries. These more affluent individuals attain bilingual opportunities, recognizing the cognitive, academic, and other practical benefits of speaking more than one language and foreseeing its application in government and commercial management. Another case in point is reflected in the fact that the U.S. Department of Education has established goals for international education "to meet the national security and economic needs through the development and maintenance of national capacity in foreign languages." These needs are met partially by providing Title VI grants and Fulbright-Hays programs for college student and faculty foreign language education. Access to these and other meaningful foreign language programs is reserved primarily for the financially advantaged portion of the U.S. population.

Families that speak other first languages in the multi-ethnic U.S. society historically have felt pressure at home, in school, and in society at large to acculturate to monolingual norms and have acquired English but have lost fluency in their ethnic language. For example, there are more Hispanics in the United States than the entire population of Canada. According to one study from the RAND Corporation, however, while more than 95% of first-generation Mexican Americans speak English, more than 50% of second-generation Mexican Americans do not speak Spanish. Opposition to bilingualism for working-class people is also manifest in the "official English" or "English only" movement and in state legislative opposition to bilingual education. These policies are similar to those in pre--World War II Germany and in Spain during the Franco era, two countries that temporarily discouraged multilingualism, and are in contrast with policies in contemporary Europe and the other nations mentioned.

In addition to the contradiction between benefits and policy in the United States, the contrast between language acquisition research and foreign language education suggests another. Research indicates that in order to acquire a second language, learners must apply strategies like those used in acquiring a first language. This finding applies to classroom foreign language education as well. One group of researchers, for example, found that students who had experienced learning academic subjects in English as a foreign language became steadily more proficient in English, while those who studied it only in a formal language classroom situation did not improve as steadily. Similar studies of child second-language acquisition and college students' success in upper-division foreign language classes corroborate this finding.

Promoting the use of foreign languages in schools in ways similar to first-language use is challenging. The method must help students focus on the topics of discussion or writing instead of on the language itself. Individuals