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Food Preference

Food and food choice constitute a major part of waking human activity, and, in the Third World, the major expense. Furthermore, food choice may be the single most important selective force in animal evolution, as suggested by the fact that many animal groups are named for their food habits (e.g., carnivores, insectivores). In human evolution, adaptations to enable the exploitation of large animals as foods played a significant role in the evolution of the human brain and human social organization. As argued persuasively by Jared Diamond (1999), early advances in food procurement, agriculture, and domestication set the stage for major advances in technology, the development of urban centers, and warfare. As a fundamental and frequent part of human life, food has served as a foundation for the cultural evolution of non-food systems; thus, food plays a major role in religion, ritual, and social exchange. It is also a source of metaphors, with words such as 'bitter,' 'meat,' and 'swallow' used in many non-food contexts. Thus, an understanding of human relationships to food promises to enlighten a major area of human concern, as well as other areas. The full range of food in human life is beautifully described in Leon Kass' book, *The Hungry Soul* (1994).

1. The Basic Relationship Between Humans and Their Food

For any person, the world can be divided into the self and everything else. Eating involves taking matter from outside the self and putting it inside the self. This is a very intimate act. It is not surprising that people feel strongly about what they eat. The costs in terms of toxins, microorganisms, or imbalanced nutrients are high, but the benefits are at least as high: survival is at stake.

Humans (and rats and cockroaches) are food generalists. They eat a wide range of foods; virtually anything that can fit into the mouth is potential food. Generalists have few innate determinants of food choice, simply because it is not easy to predict the nutritive and toxic properties of a potential food on sensory grounds. There are only a few documented innate biases in human (and rat) food choice. First, there are innate predispositions to like or dislike certain tastes. There is an innate preference for sweet tastes, which, in nature, are predictive of calorie sources. The long history of sweetness in human culture, from fruit preferences, to cultivation of fruits, to extraction of sugar from fruits, to colonization of the Americas partly to get a source of sugar, to the development of sugar substitutes, is all driven by the innate liking for sugar.

There is also an innate tendency to dislike bitter tastes, and there are probably innate predispositions to reject very strong tastes including oral irritation (as from peppers) and to like fatty textures. Second, there is a suspicion about trying new foods (on account of potential toxicity), but also a conflicting interest in them (on account of their potential as a new nutrient source). This has been described as the generalist's dilemma. Third, there is a special learning mechanism that allows learning about the consequences of ingestion, even when these may occur hours after ingestion. Fourth, there are a few specific internal states that seem to signal the need for specific nutrients. The best example is thirst. Hunger, of course, signals a general need for energy, and there may be a specific internal signal associated with sodium deficiency.

Humans are mammals, and hence have a unique first food, milk. Humans and other mammalian generalists make a transition from this single food to a very wide range of foods. This transition is made under the guidance of parents and other caretakers, and usually consists of a scheduled and graduated introduction of new foods. For all mammal species except a subset of modern humans, milk is a food limited to infancy. The development of dairying afforded the opportunity for humans to exploit milk and its products as adult foods.

2. Determinants of Human Food Choice

For humans, food choice is accounted for by some combination of biological, psychological, and cultural factors. The role of biological factors is limited for two reasons. One, as discussed above, is the human generalist orientation to food. Second, the modern

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developed-culture world presents to its members a food world that is vastly different from the ancestral world in which the biological predispositions evolved. A shortage of food has been replaced by a surplus of food. A modest range of natural, local foods has been replaced by an enormous range of foods, representing most of the world's cuisines at a neighborhood supermarket. A major risk of food poisoning from toxins and microorganisms has been sharply reduced; the longer lifetime that has resulted from this and other medical advances establishes a new and more subtle link between degenerative diseases and dietary patterns over decades. Limited knowledge about foods and their consequences is replaced by exposure through the media to massive amounts of evidence relating dietary pattern to wellness and disease. And finally, the linkage between energy expenditure and finding food (or finding anything else) has been almost eliminated. Thus, while the ancestral food environment focused on shortage and short-term consequences of eating, the modern environment stresses overabundance and long-term consequences.

Culture is the most powerful determinant of human food choice. More can be learned about an individual's food attitudes and preferences from his or her cultural identity than from any other single piece of information. Food choice is highly constrained by availability and cost, and both of these are primarily determined by culture. In addition, since availability and cost control exposure to food, they indirectly affect the developing of liking for foods, since that is substantially determined by exposure.

Cost and availability aside, human preferences and food attitudes can be framed by a psychological (as opposed to nutritional) taxonomy of foods, developed by Paul Rozin and April Fallon. A basic distinction can be drawn between preferences based on liking, that is on the intrinsic, sensory properties of foods, and instrumental preferences, based on the consequences of eating particular foods. There appear to be three types of reasons for rejecting or accepting a food: sensory–affective, that is, how pleasant a food tastes and smells; anticipated consequences, what the expected consequences are of eating a food; and ideational, what is known about a food (for example, where it comes from, what the nature of it is).

Food rejections can be understood in terms of the selection and interplay of these reasons. One category of rejections is called 'distaste.' These are entities rejected because of negative sensory–affective properties, such as lima beans, broccoli, beer, or chili pepper, for those who find these foods distasteful. A second category is 'danger.' These are things rejected primarily because they are believed to be harmful, because of acute or long-term consequences. The emotion of fear is often associated with their consumption. A third category of rejected things—the largest category—is called 'inappropriate.' These are things that the culture labels as inedible, such as pencils, grass, paper, or cloth. They might taste good, and might be harmless, but they are rejected for ideational reasons. The fourth category is 'disgust.' Rejection of food as disgusting is, like the previous category, based on ideational, culturally transmitted information but, unlike inappropriates, there is a strong belief that disgusts taste bad and are harmful. Unlike the affectively neutral response to inappropriates, the response to disgusts is strongly negative and emotional. Disgust is the most powerful reaction people have to food. Disgusting entities are so powerful that if they touch an otherwise acceptable food, they render it undesirable, disgusting, and inedible (the principle of contamination or contagion; see *Disgust, Psychology of*).

On the positive side, there are four comparable categories. Good taste (acceptance principally because of sensory properties), beneficial (acceptance largely because of consequences), appropriate (acceptance because it is culturally designated as food, or food for a particular occasion), and transvalued (food enhanced because of its prior history). The transvalued category is much weaker and smaller than the disgust category, in most cultures. In Hindu India, food that has been 'shared' with the gods (via donation to the priests in the temple, and then returned, in part), called *prasad*, is an example of transvaluation.

3. *The Acquisition of Food Preferences*

For newborn infants, the only functioning categories are good taste (e.g., sweet) and distaste (e.g., bitter). Generally, infants will place in their mouth anything that might fit in, including feces and potentially toxic foods. They reject only on the basis of sensory properties. Gradually, they acquire distastes or good tastes, and learn about danger and beneficial foods. It is much later that the full manifestations of disgust appear. The full adult categorization is in place by roughly five to eight years of age.

Most is known about the distinction between distaste and danger. When ingestion of a food is followed by nausea, it tends to become disliked, that is, a distaste. However, if ingestion of a food is followed by most other negative symptoms (e.g., lower gut pain, skin rash, respiratory distress), the food typically becomes a danger. That is, people reject a food that has caused such symptoms, but it does not usually become a disliked taste. This distinction has also been demonstrated in the laboratory with rats. With respect to affect and emotion, it is notable that dislikes (distastes) and dangers have very different properties, although the outcome (rejection) is the same. The nausea-based acquired distaste (often called a conditioned taste aversion), unlike dangers, is not based on a legitimate sense of danger. Even if a person knows that the nausea/upper gastrointestinal illness was not produced by the food, the aversion remains.

Thus, people who get nauseous and often vomit after a meal usually develop an aversion to some food in the meal, even if they know that the illness was simply the onset of influenza.

The acquisition of good tastes is more complex and less understood. Mere exposure to a food, in itself, often seems sufficient to produce an acquired like. In addition, the pairing of a food with an already positive event (an already-liked food mixed with it, positive regard by a respected person, a pleasant environment), by a process called evaluative conditioning, can lead to acquired likes (or acquired dislikes, if the paired events are negative, as in conditioned taste aversions). Leann Birch has demonstrated that indications of liking by a significant other (peer, older child, teacher, parent) may cause acquisition of liking. The process at work here is not understood. It could be a form of evaluative conditioning. But it also may involve an important instance of communication of affect or emotion. The expressed pleasure by a significant other, on consuming a food, may directly induce a pleasant state in an observer, or it may induce a mimicked positive facial expression. Either of these responses may cause enhancement of liking. Birch has demonstrated, in the laboratory, that efforts by adults to promote liking by emphasizing the beneficial consequences (better health, a specific reward for eating) seem to block the acquisition of liking for the food. It seems that when a child observes respected others enjoying a food, this promotes liking; when she is rewarded for consuming it, this seems to block the acquisition of liking.

The acquisition of knowledge of appropriate and inappropriate foods seems to be largely cognitive, and affect free. The affect-laden acquisition of disgust contrasts with this. Some communication of affect (facial and other) is almost certainly involved, but there are also important cognitive aspects; it is the nature of the foods and their history that is central to this category. Disgusting foods have contamination properties. This property requires a realization that appearance does not equal reality: a contaminated food looks like any other food, but is distinguished by its history. Young children have difficulty making the appearance–reality distinction, and it is only by age four to seven that we see signs of the ability to appreciate contamination, and hence disgust.

Individuals in specific cultures develop likings (the good taste category) for some foods that are innately unpalatable (e.g., bitter, very strong tasting, irritating). Innately unpalatable foods are typically among the favorite foods: chili pepper, black pepper, ginger and other irritant spices, coffee, bitter chocolate, tobacco, alcohol, burnt foods, and highly salted foods. Such reversals of innate aversions are common in humans, and rare in animals. We do not know how these preference reversals occur. In part, it may be through the same processes that produce normal likes: mere exposure, evaluative conditioning, and social approval. But there may also be special mechanisms that are involved in preference reversals. One is that innately negative foods may come to produce the secretion of endorphins, chemicals secreted in the brain in response to pain and irritation. These may modulate the displeasure, and like their pharmacological analog, morphine, can produce pleasure. Normally, one ceases to interact with a bad-tasting food. However, cultural forces continually reintroduce innately unpalatable foods to the child. It may be that with repeated exposures, the body endorphin response becomes stronger, and eventually cancels and then overwhelms the displeasure. Another account is that it is the very displeasure that is the source of the pleasure. This places liking for innately unpalatable foods in the same category as thrill-seeking activities such as roller coaster riding. That is, humans get pleasure out of situations in which innate aversions or fears are stimulated, but in which there is no real danger. Roller coasters are safe, and so is chili pepper. This may be case of pleasure derived from 'mind-over-matter.'

4. *Family Influences and the Family Paradox*

There are strong arguments for high parent–child resemblance in food habits. There is the common genetic heritage, the fact that parents control access (and hence exposure) to foods, and that the principal affective signals about foods in early life come from the parents. Yet parent–child correlations in liking for foods are very low, in the range of 0 to 0.3, in comparison to parent–child correlations in values (such as attitudes to abortion), temperament, or abilities. These low parent–child correlations appear whether the children studied are four-year-olds or college students. This family paradox cannot presently be explained. However, it suggests that the second six years of life, when children are much more heavily influenced by peers and teachers, as opposed to parents, may be more critical for establishing adult preferences than the first six years.

5. *Preferences and Values: Moralization and Vegetarianism*

Selecting and consuming a food has social and moral implications, as well as physiological consequences. The source of a food (e.g., who prepared it, animal or vegetable origin) can powerfully influence acceptance. Particular food or food product boycotts in recent decades testify to this fact. Hindu Indian concerns about food fall largely within the moral domain. In the United States, there is a long history linking particular foods with the good life or immorality. Through the process of moralization, choice of a particular food may move from the domain of preferences to the domain of values. This has clearly happened with cigarette smoking in the United States, and it fre-

quently happens in the course of developing vegetarianism. For some vegetarians, eating of animals is an immoral act. When ingestion of a food becomes moralized, censure of consumers becomes licensed and governments and institutions may take limiting or prohibiting actions. Such foods often become offensive (disgusting), and the rejection becomes intrinsic as opposed to instrumental.

6. *Food, Fear, and Pleasure: Cultural Perspectives*

In the non-human animal world, and among traditional humans, food is basically a source of pleasure. Even in the developed world, cost and availability aside, the principal factor influencing food choice is taste, that is to say, pleasure. Convenience and health issues are also important determinants. However, with the major changes in the human environment in the First World, obesity and the consequences of long-term exposure to particular diets have become more salient. As a result, the earlier simple pleasure of eating has given way, for many people, to ambivalence, or even outright fear. This is most well developed in American women, who often fear food as much as they savor it. In some, there is now embarrassment and guilt about consuming high fat foods, great concern about thinness, and great concern about the healthfulness of every bite of food. This is not a necessary consequence of the modern environment since, in France, the pleasures of eating still dominate.

See also: Disgust, Psychology of; Eating Disorders, Determinants of: Genetic Aspects; Food in Anthropology; Food Production, Origins of; Hunger and Eating, Neural Basis of; Taste and Smell, Psychology of; Taste and Taste Culture; Taste, Neural Basis of

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Food Production, Origins of

A bird's eye view of the human career from inception to now reveals four major landmarks: origins of hominids; origins of *Homo sapiens sapiens*; origins of food production; origins of urbanized, state-based civilizations. Like the other categories of origins research, the emergence of the first farmers and herders has long attracted attention from archaeologists, anthropologists, historians, and other scholars. Early in the twentieth century, a prominent archaeologist, Vere Gordon Childe, discussed the origins of agriculture in arid western Asia at the end of the Ice Age (Childe 1936, Chap. V 'The Neolithic Revolution,' and 1942, Chap. III 'Neolithic Barbarism'). It was not Childe, however, but another archaeologist who set himself the task of actually digging up evidence for the food producing revolution in western Asia.

1. *The Origins of Food Production in Western Asia*

Shortly after the end of World War II, Robert J. Braidwood (1960) organized the Iraq-Jarmo Project aimed at excavating the oldest agropastoral community known anywhere in the world at that time: Jarmo in Iraqi Kurdistan. Braidwood's expeditions to Jarmo between 1948 and 1955 are famous for their interdisciplinary nature, and for his suggestion that food production in western Asia began in environments like that of Jarmo, a situation he described as 'the hilly flanks of the Fertile Crescent.' He was referring to the foothill and piedmont zone, extending from the Levantine coast along the southern slopes of the Taurus and down the westerly face of the Zagros Mountains, where wild species ancestral to the earliest plant and animal domesticates were distributed.

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