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Richard A. Shweder

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Thomas R. Bidell

Anne C. Dailey

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Peggy J. Miller

John Modell

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Learning to Like Chili Peppers

Chili pepper is probably the most widely used spice in the world, if we exclude garlic from this category. More than 1 billion human beings consume it every day. This is a remarkable state of affairs because the oral irritation produced by chili pepper is innately aversive, and it is rare that someone likes it the first time it is tried. The chili peppers (genus *Capsicum*) all originate in the Western Hemisphere. First contacts with chili pepper for the Eastern Hemisphere followed on Christopher Columbus, Hernán Cortés, and Francisco Pizarro. The widespread integration of chili pepper into the cuisines of Africa, Asia, and the Mediterranean is thus astonishing, given the initially negative taste.

Why is anything that makes such a negative initial impression such a common and liked flavoring, and how is this liking acquired? The innately aversive burn produced by chili peppers results from a family of chemicals, called capsaicins, that are contained in the peppers. They probably serve to deter consumption of the peppers by mammals. It is the same innately aversive burn that appeals to chili lovers. It is not that they become insensitive to the burn, but rather that a sensation that is initially negative becomes positive. The same holds true for negative properties of many other popular human foods, including the bitterness of tobacco and coffee and the burns of black pepper and ginger. Capsaicin produces a local burning sensation and an increased blood supply in the mouth, nasal membranes, the linings of the gastrointestinal system, and on the skin. It is not harmful at modest levels.

Chili peppers were widely used in Mexico and other parts of Central and South America in pre-Columbian times, principally as a component of the flavoring placed on virtually all savory foods. Chili peppers along with corn, tomatoes, potatoes, squash, vanilla, chocolate, and peanuts constitute the principal foods involved in what Alfred W. Crosby calls the Columbian Exchange. All of these foods were introduced into the Eastern Hemisphere in the 16th century. Although they originally arrived in Europe, chili peppers did not find a principal home there. Rather, they became integrated, as a fundamental flavoring element, in the cuisines of much of the tropical and subtropical world of Africa and Asia.

We can only speculate about what promoted the adoption of chili peppers. Many of the cultures that adopted chili pepper were already using black pepper as a flavoring element. These botanically unrelated items share an irritating property; chili pepper may be less expensive to produce and may have replaced black pepper to some extent. The culinary tastes of these cultures may have already favored irritating properties. Other possible reasons are that peppers have a pleasant appearance and aroma; have some antimicrobial properties; are excellent sources of vitamins A and C; cause sweating, which in some climates may have a cooling effect; stimulate digestive activity, which may be important for high-starch diets; and add flavor and mouth stimulation to very bland diets. But most Mexicans, when asked why they like chili peppers, do not refer to these reasons but say they like the flavor and the burn.

Infants and young children find chili pepper aversive. It is

even used to facilitate weaning in some cultures by spreading it on the mother's breast. While virtually all Mexicans older than 6 years of age like chili pepper, we have been unable to find Mexican animals that like it, even though dogs and pigs consume it often as discarded food. Any account of acquisition must take this major species difference into account. Two of the known mechanisms for acquired likes for food—induction by mere exposure and some type of pairing of the taste with positive postingestive effects—may be operative, but they would hold for animals as well as humans. A third mechanism for acquired likes—social influence—may be a factor. The child's experience with older siblings, parents, and admired others who eat and obviously enjoy the burn may somehow induce a liking. It may be that the food-sharing and social-meal context characteristic of humans is sufficiently different from that of other animals that the social factor can explain the unique preference in humans. Two other possible mechanisms for the acquired liking of the burn depend on its being initially negative. We know that the brain endorphin system is activated by the experience of pain and serves to modulate the experience of pain. Normally, when we experience pain, we avoid the cause. But for chili pepper, children are continually exposed to it because it is such an integral part of the cuisine. In Mexico, small children avoid it when possible until they are 4 to 6 years old. There is evidence from animals and humans that repeated experiences with something negative promote the brain endorphin response, which becomes stronger and longer with experience. At some point, the endorphin response may overshoot, producing a net pleasant effect. But then, animals should show chili liking as well.

A fourth mechanism, which we call benign masochism, has the virtue of explaining the unique human aspect of chili preference. Humans are the only species, so far as we know, that enjoy initially negative sensations under certain "safe" conditions. Humans like to be frightened (as on roller coasters), to be made sad or angry (as in movies), and to eat foods that are innately negative in sensory properties. In all such cases, negative body reactions are elicited, but we are not really in danger. It is a form of enjoying mind over body; the body produces negativity, but we know that we are not really threatened. Young children don't like this type of experience, nor do animals. Evidence that this benign masochism may play a role in the liking for chili pepper is that the preferred level of burn for most chili likers is just below the level of unbearable pain (just like the preferred roller coaster is the scariest that can be tolerated). Liking the burn of chili pepper is an example of the widespread acquisition of liking for innately negative states by human beings; this is something that we are just beginning to understand. Paul Rozin

FURTHER READING: P. Rozin, "Getting to Like the Burn of Chili Pepper: Biological, Psychological, and Cultural Perspectives," in B. G. Green, J. R. Mason, and M. R. Kare, eds., *Chemical Senses, Volume 2: Irritation*, 1990, pp. 231–69. • A. Naj, *Peppers: A Story of Hot Pursuits*, 1992.