

# Preferring a Taste and Recognizing It May Involve Separate Brain Areas, Study Shows

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Are you disgusted when you hear about Elvis Presley's fried peanut butter 'n 'nanner sandwiches? A new study shows that it could all be in your head. In fact, our taste preferences may have little to do with whether we can even recognize the substance we're eating or drinking.

In the current issue of *Nature Neuroscience*, California Institute of Technology neuroscientist Ralph Adolphs and his colleagues at the University of Iowa report on their examinations of a patient whose sense of taste has been severely compromised. The patient suffered from a herpes brain infection years ago that left him with brain damage. Today, the patient is unable to name even familiar foods by taste or by smell, and shows remarkably little preference in his choice of food and drink.

According to Adolphs, who is a professor of psychology and neuroscience at Caltech, the subject is a 72-year-old man, known as "B," whose brain infection destroyed his amygdala, hippocampus, the nearby temporal cortices, and the insula, and damaged several other brain structures. As a result, the patient today has a memory span of about 40 seconds, somewhat similar to that of the character in the film *Memento*.

As a result of his extensive brain damage, B is unable to recognize familiar people and many objects, although his vision and his use of language are unaffected. In terms of taste, he fails to recognize any familiar food items, and could probably outdo even Elvis by wading into a banana and mayonnaise sandwich with gusto.

"Our likes and dislikes in taste stem from both innate and cultural causes," Adolphs explains. "You may like sushi or bitter melon or certain smelly cheeses, whereas other people turn away from these foods in distaste."

The research shows that it may be possible to like or dislike certain foods without being able to recognize them at all, and that different regions of the brain are responsible for these two processes.

To test this hypothesis, the researchers set up an experiment in which B, several other subjects with brain damage, and several normal subjects were all offered salty and sweet drinks. All the subjects drank the sweet drinks and said they enjoyed them, and all with the notable exception of B said they found the saline drink disgusting.

By contrast, B drank the saline solution with a pleased expression, saying it "tasted like pop." However, when he was asked to sip both a salty and a sweet drink and to continue drinking the one he preferred, he chose the sweet one and took a pass on the salty one.

The researchers concluded that B, like most people, has some fundamental preference for sweet drinks over salty ones-which goes far to explain why soft drinks have always been made with sugar rather than salt-even if he is unaware of the identity of either. In sum, it would seem that B has no preference for drinks unless he can compare them within the 40-second span of his memory.

What does this mean for us regular tasters? According to Adolphs, taste information "that is meaningless for an isolated individual stimulus can yield relative values when the taste is structured as a comparison." In other words, there's something in your brain that indeed has a preference for a sweet drink over a salty one, but there's something else in your brain that disgusts you when you're given a salty drink when you know

you could've had a cola.

The research was supported by grants from the National Institute of Mental Health and the National Institute of Neurological Disorders and Stroke. The paper's coauthors are Daniel Tranel, Michael Koenigs, and Antonio R. Damasio, all of the University of Iowa's Department of Neurology and Neuroscience.

Source: CalTech

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