

Brain activity predicts people's choices

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The activity in one brain structure can predict people's preferences, according to new research in the March 25 issue of *The Journal of Neuroscience*. The study shows that even when people rate options similarly, they will choose the one that causes more activation in the caudate nucleus, a brain region involved in anticipating reward.

The study also shows that after a decision is made, caudate [nucleus](#) activity increases for the selected option and decreases for the rejected one. The findings help to explain a classic finding in psychology.

In 1956, psychologists showed that after choosing between two similar home appliances, women subsequently claimed that the one they picked was better and the one they rejected was worse than they originally thought. In the current study, the researchers, led by Tali Sharot, PhD, a British Academy postdoctoral fellow at the Wellcome Trust Centre for Neuroimaging at University College London, used functional [brain](#) imaging to explain why people reevaluate their options after making decisions. The research team also included Raymond Dolan, MD, the director of the Centre, and Benedetto De Martino, PhD.

"The authors here repeat a version of the classic experiment, but now they can look inside the head and see how parts of the brain behave while people are making and evaluating choices," said Daniel Hommer, MD, at the National Institute of [Alcohol Abuse](#) and Alcoholism, an expert on brain systems involved in [motivation](#) and emotion who was not affiliated with the study.

The researchers imaged people's brains as they imagined vacationing in 80 different destinations around the world. After rating how much they would like to travel to each location, participants were asked to decide between similarly rated options — for example, Greece or Thailand. Participants then imagined and rated each location again, and their brains were imaged a second time.

Participants tended to choose the location that most activated the caudate nucleus during the first imaging session. In fact, the researchers found that this brain activity, which indicates anticipated reward, could predict where the subjects chose to vacation, even when thoughts of both options were similarly pleasurable. "In other words the part of our brain that attaches [emotional](#) significance to things actually 'likes' the thing we are *going* to pick more to begin with," Hommer said.

Consistent with the original psychology study, participants changed their evaluation of the destinations within minutes of making their decisions. For example, if they chose Greece over Thailand, they rated Greece higher and Thailand lower after the decision was made.

The researchers found that activation in the caudate nucleus changed in parallel with this reevaluation. Compared with the initial brain scans, caudate nucleus activation increased for the selected (Greece) and decreased for the rejected (Thailand) option in the second brain scan. The findings suggest a biological basis for post-choice reevaluation.

In addition to its role in anticipating reward, the caudate nucleus is involved in helping people learn classifications. The caudate nucleus is part of a [brain structure](#) called the striatum, which is involved in generating movement.

"Re-evaluating our options post-choice may serve an adaptive purpose by increasing an individual's commitment to the action taken. In the

absence of a rapid update of value that concurs with choice, we are likely to second-guess our decisions and actions," said study author Sharot.

More information: *The Journal of Neuroscience* -- www.jneurosci.org/

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