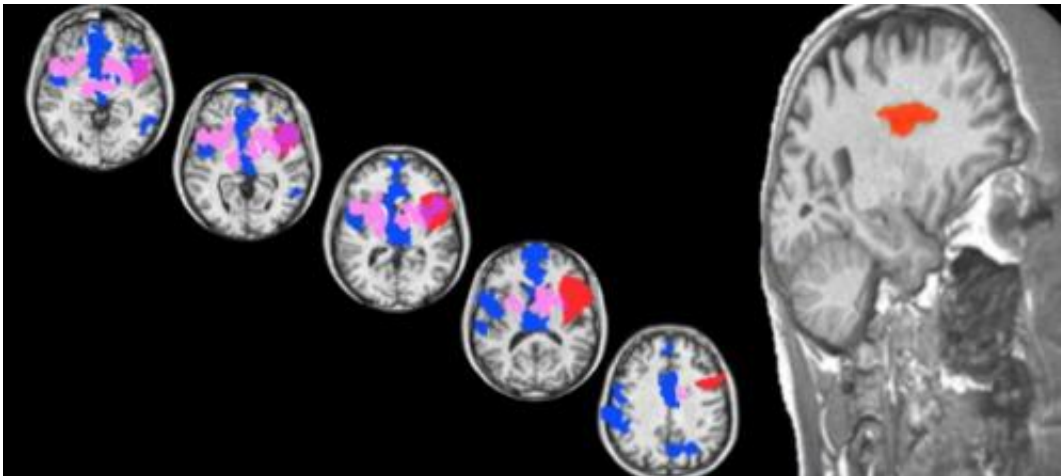


## Researchers find brain's 'sweet spot' for love in neurological patient

February 14 2014, by William Harms

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These fMRI scans show brain regions activated by sexual desire (in blue) compared to love (in pink) in healthy patients. The overlap in red illustrates how a patient's brain lesion affected the area in the brain associated with decision-making in love. Credit: Chris Frum and James Lewis/West Virginia University; Robin Weiss/University of Chicago

(Medical Xpress)—A region deep inside the brain controls how quickly people make decisions about love, according to new research at the University of Chicago.

The finding, made in an examination of a 48-year-old man who suffered a stroke, provides the first causal clinical evidence that an area of the [brain](#) called the anterior insula "plays an instrumental role in [love](#)," said

UChicago neuroscientist Stephanie Cacioppo, lead author of the study.

In an earlier paper that analyzed research on the topic, Cacioppo and colleagues defined love as "an intentional state for intense [and long-term] longing for union with another" while lust, or [sexual desire](#), is characterized by an intentional state for a short-term, pleasurable goal.

In this study, the patient made decisions normally about lust but showed slower reaction times when making decisions about love, in contrast to neurologically typical participants matched on age, gender and ethnicity. The findings are presented in a paper, "Selective Decision-Making Deficit in Love Following Damage to the Anterior Insula," published in the journal *Current Trends in Neurology*.

"This distinction has been interpreted to mean that desire is a relatively concrete representation of sensory experiences, while love is a more abstract representation of those experiences," said Cacioppo, a research associate and assistant professor in psychology. The new data suggest that the posterior insula, which affects sensation and motor control, is implicated in feelings of lust or desire, while the anterior insula has a role in the more abstract representations involved in love.

In the earlier paper, "The Common Neural Bases Between Sexual Desire and Love: A Multilevel Kernel Density fMRI Analysis," Cacioppo and colleagues examined a number of studies of brain scans that looked at differences between love and lust.

The studies showed consistently that the anterior insula was associated with love, and the posterior insula was associated with lust. However, as in all fMRI studies, the findings were correlational.

"We reasoned that if the anterior insula was the origin of the love response, we would find evidence for that in brain scans of someone

whose anterior insula was damaged," she said.

In the study, researchers examined a 48-year-old heterosexual male in Argentina, who had suffered a stroke that damaged the function of his anterior insula. He was matched with a control group of seven Argentinian heterosexual men of the same age who had healthy anterior insula.

The patient and the control group were shown 40 photographs at random of attractive, young women dressed in appealing, short and long dresses and asked whether these women were objects of sexual desire or love. The patient with the damaged anterior insula showed a much slower response when asked if the women in the photos could be objects of love.

"The current work makes it possible to disentangle love from other biological drives," the authors wrote. Such studies also could help researchers examine feelings of love by studying neurological activity rather than subjective questionnaires.

**More information:** Cacioppo S., Couto B., Bolmont M., Sedeno L., Frum C., Lewis, J. W., Manes F., Ibanez A., Cacioppo, J. T. (2013) "Selective decision-making deficit in love following damage to the anterior insula." *Current Trends in Neurology*. 7, 15-19.  
[hpenlaboratory.uchicago.edu/sites/default/files/uploads/Cacioppo%20et%20al\\_Current%20Trends%20in%20Neurology%202013.pdf](https://openlaboratory.uchicago.edu/sites/default/files/uploads/Cacioppo%20et%20al_Current%20Trends%20in%20Neurology%202013.pdf)

Provided by University of Chicago

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