

# MRI of Romantic Love

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## *Watching New Love as It Sears the Brain*

by Benedict Carey, New York Times, 31 May 2005

<http://www.nytimes.com/2005/05/31/health/psychology/31love.html> (

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New love can look for all the world like mental illness, a blend of mania, dementia and obsession that cuts people off from friends and family and prompts out-of-character behavior - compulsive phone calling, serenades, yelling from rooftops - that could almost be mistaken for psychosis.

Now for the first time, neuroscientists have produced brain scan images of this fevered activity, before it settles into the wine and roses phase of romance or the joint holiday card routines of long-term commitment.

In an analysis of the images appearing today in *The Journal of Neurophysiology*, researchers in New York and New Jersey argue that romantic love is a biological urge distinct from sexual arousal.

It is closer in its neural profile to drives like hunger, thirst or drug craving, the researchers assert, than to emotional states like excitement or affection. As a relationship deepens, the brain scans suggest, the neural activity associated with romantic love alters slightly, and in some cases primes areas deep in the primitive brain that are involved in long-term attachment.

The research helps explain why love produces such disparate emotions, from euphoria to anger to anxiety, and why it seems to become even more intense when it is withdrawn. In a separate, continuing experiment, the researchers are analyzing brain images from people who have been rejected by their lovers...

Brain imaging technology cannot read people's minds, experts caution, and a phenomenon as many sided and socially influenced as love transcends simple computer graphics, like those produced by the technique used in the study, called functional M.R.I.

Still, said Dr. Hans Breiter, director of the Motivation and Emotion Neuroscience Collaboration at Massachusetts General Hospital, ... "The findings fit nicely with a large, growing body of literature describing a generalized reward and aversion system in the brain, and put this intellectual construct of love directly onto the same axis as homeostatic rewards such as food, warmth, craving for drugs."

In the study, Dr. Fisher, Dr. Lucy Brown of Albert Einstein College of Medicine in the Bronx and Dr. Arthur Aron, a psychologist at the State University of New York at Stony Brook, led a team that analyzed about 2,500 brain images from 17 college students who were in the first weeks or months of new love. The students looked at a picture of their beloved while an M.R.I. machine scanned their brains. The researchers then compared the images with others taken while the students looked at picture of an acquaintance.

... the researchers found that one particular spot in the M.R.I. images, in the caudate nucleus, was especially active in people who scored highly on a questionnaire measuring passionate love.

This passion-related region was on the opposite side of the brain from another area that registers physical attractiveness, the researchers found, and appeared to be involved in longing, desire and the unexplainable tug that people feel toward one person, among many attractive alternative partners.

This distinction, between finding someone attractive and desiring him or her, between liking and wanting, "is all happening in an area of the mammalian brain that takes care of most basic functions, like eating, drinking, eye movements, all at an unconscious level, and I don't think anyone expected this part of the brain to be so specialized," Dr. Brown said...

In the new study, the researchers also saw individual differences in their group of smitten lovers, based on how long the participants had been in the relationships. Compared with the students who were in the first weeks of a new love, those who had been paired off for a year or more showed significantly more activity in an area of the brain linked to long-term commitment. ...

In a follow-up experiment, Dr. Fisher, Dr. Aron and Dr. Brown have carried out brain scans on 17 other young men and women who recently were dumped by their lovers. As in the new love study, the researchers compared two sets of images, one taken when the participants were looking at a photo of a friend, the other when looking at a picture of their ex.

Although they are still sorting through the images, the investigators have noticed one preliminary finding: increased activation in an area of the brain related to the region associated with passionate love. "It seems to suggest what the psychological literature, poetry and people have long noticed: that being dumped actually does heighten romantic love, a phenomenon I call frustration-attraction," Dr. Fisher said in an e-mail message... ([full article \(http://www.nytimes.com/2005/05/31/health/psychology/31love.html\)](http://www.nytimes.com/2005/05/31/health/psychology/31love.html) )