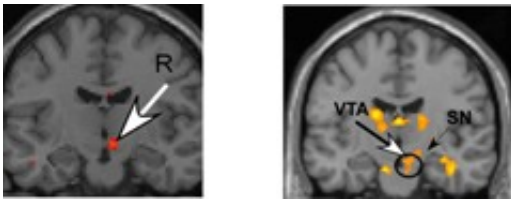


## Love can last: Brain activity of those in love long term similar to those newly in love

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Functional Magnetic Resonance Imaging (fMRI) showing group brain activations of individuals recently fallen in love (at left) compared with long-term married and in love individuals shows similar neural activity in the ventral tegmental area (VTA) of the brain. Long-term married individuals also show activation within another area of the brain (substantia nigra).

(PhysOrg.com) -- Can science prove that romantic love can last? A new study led by Bianca Acevedo, Ph.D., and Arthur Aron, Ph.D., of the Department of Psychology at Stony Brook University, and colleagues, compared the neural correlates of long-term married and in love individuals with individuals who had recently fallen in love.

They discovered highly similar brain activity in regions associated with reward, motivation and "wanting" in both sets of couples. In an article titled, "Neural correlates of long-term intense romantic [love](#)," reported online in *Social Cognitive and Affective Neuroscience*, the study is the first to image and analyze the neural correlates of people in long-term romantic love and could give scientists clues as to why couples stay in

love.

The research team used functional Magnetic Resonance Imaging (fMRI) to scan the brains of 10 women and 7 men who reported that they were still intensely in love with their spouse after an average of 21 years of marriage. Participants viewed facial images of their partner, and control images including a close friend, a highly-familiar acquaintance, and a low-familiar person. [Brain activity](#) was measured while participants viewed the facial images.

The researchers then compared the fMRI imaging results with those from an earlier experiment (Aron et al., 2005) that used similar fMRI scanning methods with 10 women and 7 men who had fallen madly in love within the past year.

"We found many very clear similarities between those who were in love long term and those who had just fallen madly in love," says Dr. Aron, referring to key reward and motivation regions of the brain, largely parts of the dopamine-rich ventral tegmental area (VTA). "In this latest study, the VTA showed greater response to images of a long-term partner when compared with images of a close friend or any of the other facial images."

"Interestingly, the same VTA region showed greater activation for those in the long-term couple group who scored especially high on romantic love scales and a closeness scale based on questionnaires," adds Dr. Acevedo.

Overall, Drs. Acevedo and Aron explain that the brain imaging data on the long-term couples suggest that reward-value associated with a long-term partner may be sustained, similar to new love. Additionally, the results support theories proposing that there might be specific brain mechanisms by which romantic love is sustained in some long-term

relationships.

While the mysteries of romantic love and how love can be maintained long term may never be fully understood by humans, Drs. Acevedo and Aron believe that the study provides evidence and possibly powerful clues to what may be essential activity in the brain for love to last.

Some other novel results from the study include: greater closeness with the partner was associated with activity reflecting reward and motivation (in the VTA and substantia nigra), as well as human awareness (middle insula and anterior cingulate cortex); relationship length was significantly associated with activity of the ventral and dorsal striatum, similar to individuals who yearn for a deceased loved one or experience cocaine-induced high, thus linking attachment bonds with addiction-related properties; and sexual frequency was positively associated with activity of the posterior hippocampus, in an area found in studies of hunger and craving, as well as for obsession and early-stage love.

Provided by Stony Brook University

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