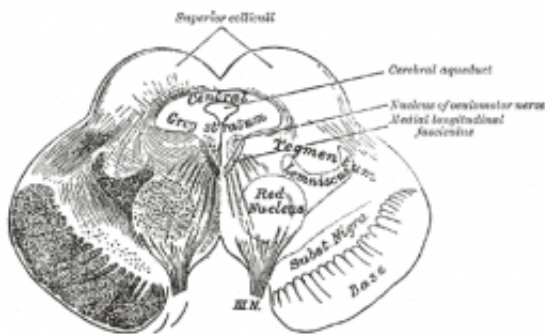


Neurochemical evidence that long-lasting love is possible

May 11 2011, by Deborah Braconnier



Transverse section of mid-brain at level of superior colliculi. (Tegmentum labeled at center right.) Image: Wikipedia

(Medical Xpress) -- We all remember that feeling of intense emotions as a new love and romance begins. Despite the ongoing debate that intense love fades through the years, there are still many couples who claim to have that intense feeling years after marriage. In a new study published in *Social Cognitive and Affective Neuroscience*, researchers have discovered similar neurological responses in those experiencing new love and those in long-term and passion filled relationships.

The study first looked at those in the rush of a new relationship and love. Researchers found that these individuals, when presented with an image of their partner, showed responses in the area of the brain that processes the [brain chemical](#) dopamine. This is the area of the brain that is often

associated with food and alcohol and is a motivator for wants and [desires](#). When these same individuals were shown images of similar looking people, that region of the brain remained unaffected.

Social neuroscientist Arthur Aron from Stony Brook University in New York and his team then conducted the same study on 17 adults who had been in long term marriages ranging from 10 - 29 years and who stated they still felt as in love as they had at the beginning. Aron created a seven-point scale which rated the intensity of love participants felt in their relationship and all those participating scored a five or more. With an MRI machine recording [brain activity](#), participants were shown pictures of their partner's face as well as the faces of others they were close to but not in love with.

Both groups showed similar activity in the [ventral tegmental area](#), which is the dopamine-processing region. Those long-term relationship participants who rated themselves highest in the seven-point scale showed more activity than those who scored only five.

The study also showed differences between the brain activities of both groups. Those in new relationships showed activity in the regions related to obsession and tension while those long-term relationship participants showed activity in the regions related to pair bonding and attachment.

The team believes this research shows that the claims of long-term intense love relationships are possible and that this is the beginning step to understanding the biology behind long-lasting love and relationships.

More information: Neural correlates of long-term intense romantic love, *Soc Cogn Affect Neurosci* (2011) [doi: 10.1093/scan/nsq092](https://doi.org/10.1093/scan/nsq092)

Abstract

The present study examined the neural correlates of long-term intense

romantic love using functional magnetic resonance imaging (fMRI). Ten women and 7 men married an average of 21.4 years underwent fMRI while viewing facial images of their partner. Control images included a highly familiar acquaintance; a close, long-term friend; and a low-familiar person. Effects specific to the intensely loved, long-term partner were found in: (i) areas of the dopamine-rich reward and basal ganglia system, such as the ventral tegmental area (VTA) and dorsal striatum, consistent with results from early-stage romantic love studies; and (ii) several regions implicated in maternal attachment, such as the globus pallidus (GP), substantia nigra, Raphe nucleus, thalamus, insular cortex, anterior cingulate and posterior cingulate. Correlations of neural activity in regions of interest with widely used questionnaires showed: (i) VTA and caudate responses correlated with romantic love scores and inclusion of other in the self; (ii) GP responses correlated with friendship-based love scores; (iii) hypothalamus and posterior hippocampus responses correlated with sexual frequency; and (iv) caudate, septum/fornix, posterior cingulate and posterior hippocampus responses correlated with obsession. Overall, results suggest that for some individuals the reward-value associated with a long-term partner may be sustained, similar to new love, but also involves brain systems implicated in attachment and pair-bonding.

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