

3Qs: A crazy little drug called love

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Moviemakers and songsters have long realized that love affects us just like an addiction. Now the scientists can confirm it. Credit: Thinkstock.

Singers and filmmakers know it: Love is a drug. Popular lines such as, "Love is the drug, got a hook on me," or "I wish I knew how to quit you," solidify this pop culture notion. But is it really true, scientifically speaking? Does romantic love look the same way on our brains as alcohol, tobacco, or cocaine? Well, yes, as a matter of fact, it does.

A new study from the Interdisciplinary Affective Science Lab of

Northeastern University Distinguished Professor of Psychology Lisa Feldman Barrett compiled data that scientists have collected over the years, confirming that yes, love is indeed a kind of drug. We asked Shir Atzil, a postdoctoral research associate in Barrett's lab, to explain the findings.

How does romantic love mirror addiction in the behavioral patterns elicited by the two phenomena?

The behavior of a drug user has a lot in common with someone in love. The intense overwhelming high feeling that accompanies falling in love can be compared to the euphoric "high" experienced during initial drug use. When in love, all you can think about is your partner. Such "intrusive" thoughts and desire for proximity also characterize drug users and their typical drug seeking behaviors. At this point, longing for your lover may feel very similar to craving your drug. After a while, the gradual disappearance of the bliss associated with new love is similar to tolerance. The same stimulus—your partner or the next "hit"—is no longer sufficient to maintain the same level of ecstasy.

Last, both breaking up and suspending drug use causes "withdrawal-like" unpleasant reactions. Often romantic partners will keep seeing each other, even though they realize it is bad for them, just to avoid these feelings of "love withdrawal." Drug use and attachment are not only behaviorally alike, but also impact each other. Using drugs can soothe the painful yearning for a lost partner, and the loss of a partner can enhance drug use. Moreover, both phenomena are triggered and modulated by stressful events.

How are those behavioral patterns reflected in our neurobiology, and does the similarity persist in the brain?

Active drug users secrete dopamine in certain [brain regions](#) such as the nucleus accumbens, putamen, pallidum, and caudate, which together make up the mesolimbic dopamine system. This dopamine secretion is thought to reflect the good feeling, the "reward," that they get from using the drug and create the motivation to get more of that drug. Merely seeing a cigarette will cause an addicted person to secrete dopamine.

To the brain, showing the [romantic partner](#) to a person in love is quite similar to presenting a cigarette to a smoker. When a subject lying inside a brain scanner sees a picture of his romantic partner, the same mesolimbic dopamine brain regions are activated. Cortical brain regions usually linked to mentalizing, such as the medial-prefrontal cortex and posterior cingulate, are also consistently involved in both addiction and romance. According to the incentive sensitization theory of addiction, the dopaminergic reward response following each "hit" sensitizes the brain to the next "hit" and actually makes the drug more desirable. It seems that both drug use and romance follow this principal of the incentive sensitization. The neural adaptations following the repeated exposure to our new romantic partner transform ordinary levels of interest into excessive intense [love](#).

How can the knowledge of this overlap inform future addiction prevention or treatment protocols?

Being "addicted" to a lover is evolutionarily beneficial. Love is strongly supported by a biologically-based reward system that evolved to motivate mate selection and courtship behavior. Given that drugs seem to operate on the same neural pathways, it has been suggested that drugs "hijacked" the romance neural mechanism, which may be the reason for its robust addictive potency. Establishing the commonalities between romantic affiliation and drug use raises the possibility of new research that could enhance our understanding and coping strategies for dealing

with phenomena such as the individual differences associated with the vulnerability to drug abuse. Moreover, the mechanistic similarity between drug use and romance marks the potential of social attachment and support as a prophylactic and therapeutic aid to deal with [drug](#) abuse.

Provided by Northeastern University

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