Sarkis Marie, Khalil Joey

COMM 344

Dr Zinnia Shweiry

The Chemistry of Love: Understanding the Brain's Role in Romance

Every one of you has experienced being drawn to an intriguing person when your gaze catches theirs. Or the ball of nerves that forms in your stomach upon receiving a text from your crush. Or the connection you get when you hug your partner at home after an exhausting working day. You are now in your 20s, the part of your life where you might have met or potentially will meet your partner. Wouldn't it be interesting if you knew the science behind your feelings? As students who took a morphology course, we thought it would be interesting to look at love and attraction, that are often expressed through poetry and art, through a scientific look. We are going to discuss the neuroscience of attraction that reveals how complex chemical and neurological processes drive human connection, influencing everything from physical attraction to emotional bonding, and shaping how we form relationships on a subconscious level.

You could say that love, in its early stages, begins as a stressor, which is the result of a chemical symphony in your brain. According to a 2015 Harvard Medical School study, the first stages of romantic love are marked by elevated levels of the stress hormone cortisol, which prepares your body for the impending "crisis," sharpening your focus, and making you

hyperaware of every detail. This nervous excitement you experience around someone you're drawn to is your body's response to stress in a beneficial way, helping you react more sensitively to their presence. Norepinephrine, as well, is secreted to help your body counter stress, raising your heart rate, and filling you with energy, creating those unmistakable butterflies in your stomach. Dopamine, responsible for pleasure, surges, and euphoria, like the satisfaction of enjoying your favorite dessert or achieving a major goal, is also released.

Contrary to these listed previously, serotonin levels drop, leading to obsessive thoughts about the person you are drawn to. This shift throws you off causing anxiety and mood fluctuations, which explains why falling for someone can feel like an emotional rollercoaster. The ups and downs of attraction stem from this temporary imbalance, resulting in an experience that is both exciting and emotionally unstable. However, just as any other form of stress would be detrimental to you, relationships that perpetuate ongoing tension, whether from unfulfilled love or from a turbulent or abusive relationship, are emotionally unhealthy and detrimental to your physical health.

Despite the stress that it brings into your life, love can be seen as a reinforcing action that activates your reward system, leading to an intensely pleasurable experience; it's not quite an addiction, but it has similar qualities. Georgetown University states that your brain's reward system plays a key role in attraction, encouraging behaviors that promote connection. Your brain has regions that work together to form the mesolimbic system, the reward circuit. An increase in cortisol and dopamine are this system's two primary components. According to Harvard Medical School, oxytocin, the love hormone, and vasopressin are secreted from the pituitary into the blood during sexual activity. These reinforcing hormones are crucial for pair bonding, empathy, security, committed partnerships, territorial aggression, and mate guarding. The reward system shares neural pathways with primal urges such as thirst which could be why it is difficult to

control. So, if you are disordered, it is not your fault, this is how you were designed. It is interesting to note that cocaine addiction exhibits activation in the same brain regions as passionate love. According to "The Anatomy of Love", romance is one of the natural addictions that has been maintained by natural selection while abuse-related drugs take over these systems, eliciting pleasurable feelings but not beneficial effects.

Interestingly enough, love - this stressor and this addiction - in its late stages, becomes a buffer against stress, playing a crucial role in helping you manage the hardships that come with life. Futurity.org discusses a recent study where participants were asked to dip one foot in chilly water. The participants, all of whom were in committed relationships, were randomly allocated one of three conditions by the researchers: think about their romantic partner, have their significant other sit silently in the room with them, or reflect on what happened during their day. Researchers found that individuals who were instructed to reflect on their day responded to the stress by raising their blood pressure more than those who thought about or had their spouse present in the room, proving that having a romantic connection may help people manage stress more effectively and have lower levels of cardiovascular reactivity. Love also turns off the neurological pathway between the amygdala and the nucleus accumbens, that generates negative emotions like fear and social judgment. It is such a strong emotion that brings peace and serenity to couples that when it dies, it is shocking what a huge deal that is for one's body and mind. It is no less difficult than losing a loved one to death, if not harder because during a breakup, that someone made the decision not to be in your life. Breaking up can be described as a depressive episode since it is such a big adjustment. Breakups not only make you feel more stressed, but they also make it harder to stay motivated to take healthy actions. For example, they may decrease your desire to work out or result in stress eating unhealthy foods.

The neuroscience of attraction opens a window into the processes that shape our relationships. From the rush of dopamine to the warmth of oxytocin, our brains are constantly at work, influencing who we are drawn to and why. As we understand the brain's pathways, we gain insight into the complexities of our relationships. But beyond science, remember that attraction is not merely a chemical reaction; it's a rich assortment woven from our experiences, values, and stories. Yet, armed with this knowledge, we must ask ourselves: How can we consciously apply these insights to deepen our connections and foster love in our lives? As we continue to explore the mysteries of attraction, let us not fail to remember the power of our choices and intentions in shaping the relationships we cherish; let us strive to blend science with our own humanity.

References:

Arizona, A. B. (2019, January 23). Thoughts of love buffer blood pressure against stress. Futurity. <u>https://www.futurity.org/blood-pressure-stress-partners-1963972/</u>

Djajapranata, C. (2024, February 14). The Neuroscience of Love: What's going on in the lovestruck brain? - Georgetown University. Georgetown University. <u>https://www.georgetown.edu/news/the-neuroscience-of-love-whats-going-onin-the-lovestruck-brain/</u>

Edwards, S. (2015). *Love and the Brain*. Harvard Medical School. <u>https://hms.harvard.edu/news-events/publications-archive/brain/love-brain</u>

Jbro. (2016, February 14). *Our first study of romance: the reward system - The Anatomy Of Love*. The Anatomy of Love. <u>https://theanatomyoflove.com/conclusions/first-study-romance-reward-system/</u>

Williamson, L. (2023, February 10). *This is your brain on love*. Www.heart.org. https://www.heart.org/en/news/2023/02/10/this-is-your-brain-on-love