Love

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Humans developed three independent yet overlapping neural systems that influence how we form pair bonds

- Lust
- Attraction
- Attachment
Lust

- Also known as libido or sex drive
- Promotes mating with a range of promising partners
- Influenced primarily by estrogens and androgens
Attraction

- Guides us to choose one particular partner
- Characterized by increased energy, focused attention, intrusive or obsessive thoughts, cravings for emotional union
- Dopamine and Norepinephrine levels are high
- Serotonin levels are low
Attachment

- Facilitates cooperation between partners to complete parental duties
- Influenced primarily by oxytocin and vasopressin
- Brings feelings of calm, security, social comfort, and emotional union.
So how do we choose?

- “Somewhere between the ages of 5 and 8, individuals develop a love map--an unconscious mosaic of traits that they will look for later in a mate”
Addiction - In DSM IV

Substance dependence, or addiction, as defined by the DSM-IV, is indicated by the presence of three or more of the criteria listed to the right in the last 12 months. Note that all but the first two criteria reflect some form of loss of control over the use of or effects of the drug.

**Tolerance:** Does the patient tend to need more of the drug over time to get the same effect?

**Withdrawal symptoms:** Does the patient experience withdrawal symptoms when he or she does not use the drug?

**Continued use of drug despite harm:** Is the patient experiencing physical or psychological harm from the drug?

**Loss of control:** Does the patient take the drug in larger amounts, or for longer than planned?

**Attempts to cut down:** Has the patient made a conscious, but unsuccessful, effort to reduce his or her drug use?

**Salience:** Does the patient spend significant time obtaining or thinking about the drug, or recovering from its effects?

**Reduced involvement:** Has the patient given up or reduced his or her involvement in social, occupational or recreational activities due to the drug?
The DSM-V recognizes substance related disorders resulting from the use of ten separate classes of drugs:

- alcohol
- caffeine
- cannabis
- hallucinogens
- other hallucinogens such as LSD
- inhalants
- opioids
- sedatives
- hypnotics, anxiolytics, stimulants (including amphetamine-type substances, cocaine, and other stimulants), tobacco, and other or unknown substances.
Addiction - Why Is it?

-Thinking about one’s loved one triggers neurotransmitters in the Ventral Tegmental Area.
Addiction - Reward Pathways

- Increased dopamine release in ventral tegmental area (VTA)
- VTA projects to Nucleus Accumbens
- Vasopressin and oxytocin may facilitate dopamine release in VTA and enhance memory
- Anterior cingulate and orbitofrontal cortex thought to be involved in addiction
Addiction - Withdrawals

- Intensely focused attention, mood swings, cravings, obsession, compulsions, personality changes, risk taking
- Absence similar to withdrawal
- Negative mood, sleep disturbance, cravings
- Classic addiction signs
- Tolerance
- Withdrawal
- Relapse
Addiction -

“A maladaptive or problematic pattern of love relation leading to clinically significant impairment or distress, as manifested by three (or more) of the following, (occurring at any time in the same 12-month period for the first five criteria): (source: DSM-IV).

- Existence of a characterized withdrawal syndrome in the absence of the loved one, by significant suffering and a compulsive need for the other.
- Considerable amount of time spent on this relation
- Reduction in important social, professional, or leisure activities.
- Persistent desire or fruitless efforts to reduce or control relation.
- Pursuit of the relation despite the existence of problems created by this relation.
- Existence of attachment difficulties”
Ethics - Enhancing Love

Oxytocin - Enhances Brain Reward System
Ethics - Enhancing Love

Nucleus Accumbens
Ethics - Enhancing Love

Ventral Tegmental Area
Ethics - Enhancing Love

Oxytocin Nasal Spray - Potential Aid to Traditional Marital Therapy

Downsides?
Ethics - Anti-Love

95% of college students were rejected by someone they loved and rejected someone who loved them.
Ethics - Anti-Love

- Lust
- Attraction
- Attachment
Ethics - Anti-Love

Internet Sex Addiction - Naltrexone
Ethics - Anti-Love

Serotonin Transporter:
  Lower Levels Found in OCD Patients and Those in First Stage of Relationship

ssRIs
Ethics - Anti-Love

“Stockholm Syndrome” - Long Term Domestic Abuse

Oxytocin and Dopamine Antagonists