

The science behind love songs

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Credit: Pexels

There's nothing like a love song to get your heart racing, right? To mark Valentine's Day we look at five love songs and ask University of Melbourne scientists for the truth behind them. Why have we evolved 'love', why is it so important to humans, and why give red roses?

1. What Is Love? (Howard Jones, 1984)

Is [love](#) a feeling or an emotion? It's a confusing question because the

terms are sometimes used interchangeably, but as Professor Nick Haslam from the Melbourne School of Psychological Sciences explains, love is an emotion. The feeling is a person's subjective experience of the emotion.

"Love is defined as an emotion because in addition to being a feeling it's associated with bodily processes such as the release of hormones, and also tendencies to act in particular ways, essentially wanting to maintain closeness to the beloved person," Professor Haslam says.

"Sometimes the progression of love is described as lust, attraction then attachment, sometimes as [passionate love](#) to companionate love, sometimes as a movement through passion to intimacy and then to commitment ... ideally not losing each ingredient along the way!"

2. Love Is The Drug (Roxy Music, 1975)

The three stages of love are defined by some of the most powerful chemicals in the body, says Professor Haslam.

Lust, the first stage, is driven by the sex hormones testosterone and oestrogen. Although traditionally associated with men, testosterone also plays a major role in the sex drive of women.

The next stage of attraction, he says, is dominated by a group of brain chemicals or neuro-transmitters.

"Dopamine is responsible for that euphoric feeling towards another person and norepinephrine, otherwise known as adrenalin, makes the heart race," says Professor Haslam.

"But serotonin is possibly love's most important chemical. Low serotonin levels are associated with being in love, and it is thought that this drop

makes us feel obsessively infatuated.

"In the third stage of love, attachment takes over to create a lasting relationship. This is the bond that keeps couples together after attraction has passed, and if they go on to have children."

In this phase, he says the hormones oxytocin and vasopressin are released by the nervous system.

The importance of vasopressin in long-term relationships was discovered when scientists studied the prairie vole.

When male prairie voles were given a drug that reduced the effect of vasopressin, the bond with their partner immediately deteriorated as they lost their devotion and failed to protect their partner from new suitors.

The hormone oxytocin is produced by the brain in the hypothalamus and then released by the pituitary gland of both sexes during orgasm. It is thought to promote bonding when adults are intimate.

"Oxytocin also is expressed during childbirth, helping the breast express milk and cementing the strong bond between mother and child," Professor Haslam says.

3. Why Do Fools Fall in Love? (Frankie Lymon & The Teenagers, 1964)

Professor Mark Elgar, from the School of BioSciences, says these 'attachment hormones' add to the theory that humans may have initially evolved love to support each other during the demanding times of raising young children.

"Human infants are extremely helpless compared with those of most mammalian species, whose babies are born around the stage a two year-old human child would be.

"That's because humans have developed comparatively large brains for our body size, so our babies are essentially born prematurely so that the baby's head can fit through the woman's small birth canal.

"As a result caring for a human infant is highly time and resource-intensive, which may explain why humans typically have a strong and durable attachment bond for parenting."

However, Professor Elgar notes love doesn't have a purely biological basis.

"Like humans, some sea birds pair bond for years, perhaps decades, but it would be pushing the envelope to call this love. Love requires empathy and theory of mind to really understand and connect with another person, and that makes us special."

4. Love Is in the Air (John Paul Young, 1977)

When it comes to attracting a mate, love really is in the air, says Professor Elgar.

Animals produce pheromones, which are chemicals released into the environment that affects the behavior or physiology of others of the same species."

"Suitors need to discern themselves from rival mates, like having the most impressive Tinder or Facebook profile. And because potential mates are often spread far and wide across the environment, they need to leave a specific 'calling card' ".

Professor Elgar and his team have studied the chemical communication of many species, particularly insects. They found that female spiders leave a chemical signal on their web, and male spiders are more attracted to the signal of a female who isn't from the local spider population.

"We predict that spiders are attracted to others who are not genetically similar in order to create stronger offspring. The mixing of genes creates a stronger immune system to fight off disease."

This phenomenon has also been shown in humans in a famous study from 1995, where researchers at the University of Bern in Switzerland asked a group of women to smell some unwashed T-shirts worn by different men. They also took blood samples from both the men and women to look at the genes that regulate their immune system.

The study revealed that women consistently preferred the smell of men whose immune systems were more different from their own, supporting the idea that animals can sniff out a mate that is best for the genetics of their offspring.

5. Love is a Rose (Linda Ronstadt, 1977)

To express their love and devotion, humans have long given flowers to each other.

The rose is thought to symbolize eternal love between the ancient Greek goddess Aphrodite and her great love, Adonis.

In Western cultures, red roses are synonymous with romantic love, but many other cultures have their own flower and colour variations for love, says John Rayner, lecturer in horticulture in the Faculty of Science.

"It's understandable that red has become so associated with love," says

Mr Rayner. "In garden design we call red an 'advancing or hot colour', which means that it comes to the fore of our vision and dominates, much like passion does.

"New varieties of roses are often grown and dedicated by the breeder to a loved one. Roses lend themselves to this gesture thanks to their basic biology. The sexual organs of roses are large, making crossing varieties easier."

He points out that in Asian countries other flowers like the chrysanthemum represent love, and in Hindu cultures, white is the colour of love in jasmine flowers.

Sunflowers are also associated with a romantic legend where in Greek mythology Clytie the water nymph fell madly in love with Helios, the sun god. But Helios was in love with another woman. The love-struck Clytie watched him race his chariot across the sky for so long that she became rooted to the ground and transformed into a sunflower.

"Perhaps this year the time has come for Valentine's Day to adopt an international symbol of love, like a United Nations bouquet of red roses, chrysanthemums, jasmine and sunflowers."

Now that would be a conversation starter at a dinner for two.

Provided by University of Melbourne

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