Critique of "Romantic love modulates women's identification of men's body odors"

By

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Background:

Romantic love is one of the most defining human emotions, occurring in all nations and cultures of the world and is as old as humanity itself. Romantic love is characterized by noticeable changes in neuroendocrine stats, neurological function and overt behaviour. Yet, the mechanisms behind these changes are relatively unknown.

The long-standing psychological mechanism of romantic love has been that heightened attention toward one's partner leads to heightened feelings of attachment, reward and commitment. However, two separate mechanisms are now frequently proposed in literature; attention theory and deflection theory. Attention theory states that an increase in attention towards one's partner leads to an increase in attachment and promotes shared activity and a long-term relationship. Evidence for this theory is given by the correlation between increased oxytocin levels and feelings of romantic love. Deflection theory states that an increase in passionate love will decrease attention paid towards other potential mates, which reduces relationship threats and promotes long term commitment. Support for this theory is provided by studies showing that people in romantic relationships spend less time observing attractive, opposite-sex individuals and their overall rating of attractiveness of said individuals is lower.

The ability to recognize an individual is a major component in developing all social relationships. It has been widely been established that humans can use visual and auditory cues to identify individuals, more recently, studies have begun to indicate that humans can also use olfactory cues as a means of identification. Human body odors carry with them information that can be perceived by the sensory system and used to aid in the identification of an individual. Yet, identification by body odor alone is quite difficult, so the process may be aided by limited conscious recognition. The ability to identify odour is known to be correlate with allocated attention.

The aim of this study was to determine the contributing factors behind the two potential mechanisms of romantic love by assessing the ability of human participants to identify individual body odors. Specifically, it tested whether a heterosexual woman's ability to identify the body odor of her romantic partner, and that of a male and female friend, is influenced by the degree of romantic love felt towards her partner.

Methods:

The study involved 20 nulliparous, self-described heterosexual women at various stages of their menstrual cycles. Each woman also brought with them their boyfriend and two close heterosexual friends (one male, one female). There was no significant difference in the length of the friendships. Couples must have been in a relationship for only 12-36 month and have expressed deep romantic love in a semi-structured interview. The time frame was selected to control for hormonal influences originating from the stage of romantic love.

Body odors where collected by odorless cotton nursing pads stitched into the arm pits of cotton t-shirts, which where slept in for seven consecutive nights. Prior to collection of odors, participants were given odor-free detergent to wash t-shirts and any bedding to be used. Participants followed instructions regulating diet, personal hygiene and contact with pets and other individuals. However, only direct contact was prohibited and social contact remained uncontrolled. T-shirts were stored in zip-lock bags while not in use and returned on the eighth day of testing. Upon completion, odor pads were removed and placed in large, open-mouthed glass bottles and frozen at -80°C until used.

In order to establish a control and test the ability to identify odors, participants were subject to the Sniffin' Sticks 16-item cued olfactory identification test, which involves correctly matching cue cards to felt-tip pens containing suprathreshold odors. To establish a level of romantic love felt towards their partner, participants where ranked using the Passionate Love

Scale. This consists of 30 statements related to emotions felt in a relationship, which a participant then ranked in accordance to how much it relates to their current relationship. The ability to identify a specific individual's body odor was tested in a three-alternative, no-feedback, forced-choice task with seven trials. Body odors from other participants where used as lures. To control for the effect of perceived intensity of odor with regards to identification, the perceived intensity of each odor was recorded using a 10cm visual analog scale. The true aim of this study was withheld from participants until completion.

To establish connections between body odor identification performance and variables of interest, a multiple regression analysis with stepwise exclusion was performed along with individual bivariate Pearson correlation analyses for each body odor. Only two-tailed significance was used and all results underwent Bonferroni corrections. Also, potential differences in perception where analysed with repeated measures ANOVA, while differences in menstrual cycle were analyzed with a one-way ANOVA. Finally, separate one-sample Student *t*-tests were used to evaluate odor identification performance above chance for the Sniffin' Sticks test.

Findings:

All participants achieved normal results on the Sniffin' Sticks control task and were able to identify above chance the odors from their partner, or male or female friend. However, there was no significant difference in the accuracy in which participants could recognize odors from each odor category. There were also no significant effects due to menstrual phase on odor identification. Menstrual phase was not an aim of the study and some data points were very small (3 women in follicular phase), therefore, these results should be taken lightly.

The length of exposure to either romantic partner or friend and the effect this duration would have on identification was also considered. No significant correlation was found between

length of partnership or friendship and identification performance. There was also no correlation between Sniffin' Sticks test results and identification of odors from either partner or friends. A regression model used to assess whether other measured variables influenced the relationship between the ability of the women to accurately identify a male friend's body odor and the level of passionate love felt. This model did not see significant results after Bonferroni correction; however, of all the variables considered, the romantic love scores contributed the most.

There was no correlation found between the accuracy in which the women could identify the odor of a same sex friend or their boyfriend and the level of passionate love they felt towards their partner. On the other hand, there was a significant negative correlation between the accuracy of odor identification for an opposite sex friend and passionate love felt, with increased passionate love there was a lower accuracy of odor identification. Together, these two results together support the deflection theory. The women see their male friends as a potential mate and deflect attention from them towards their boyfriend, seen in the negative correlation. Their female friends have no effect on mate choice and therefore do not affect odor identification ability, seen in the lack of difference between identification accuracy of same-sex friend and romantic partner. It is suggest, however, that the competing theory, attention theory, is also taking place, just at a different time

The study goes on to suggest that the reason for the women's inability to identify opposite-sex friends when experiencing a large degree of romantic love is due to elevated levels of oxytocin. The oxytocin blocks the reception of vasopressin, which in turn lowers the capacity for olfactory recognition by reducing the salience of an opposite-sex individual's body odor. The oxytocin also acts to increase feelings of attachment towards a romantic partner. Thus, the mechanism acts upon two separate systems and has added survival benefits.

Critique:

In choosing to study the effects of romantic love, the authors of this study started with the disadvantage of having to accurately define the complex emotion of love. The authors never actually state what romantic love is; they only say it's a change in state or a heightened sense of attraction. The authors also fail to provide accurate background information concerning human olfaction, as they provide only two sentences on the topic. They do not explain how individuals process olfactory cues, nor do they state what components of an odor are being used for identification. Understanding the process of human olfaction recognition is integral to being able to properly apply results to a conclusion.

In regards to the methodology of this paper, a few key aspects come into question. First, the study revolved around only 20 women, which is a small number, so small that in some definitions, it does not meet the requirements of central limit theorem (which applies to statistical analysis). This in turn, affects the validity of the experiment and its applications to humans overall. The authors also fail to include how the participants were selected, which is important when criteria limiting the inclusion of individuals into the study is based upon subjective concepts such as how close (in a relationship) a friend is to you. Continuing with the issues in friendship, the authors do not control for the type of friendship involved. For example, in an age where technology has improved communication to a point where direct contact between friends is no longer necessary, it is possible to have a close friend that you physically are around less often than other friends. Additionally, the authors never state why they chose to only use heterosexual participants. The authors do make the assumption that women can use odors to identify individuals better than men can, so why not also test whether a homosexual woman displays a negative correlation between odor identification of an opposite-sex friend and romantic love (although this type of study would require more background on sexual

preference)? Subsequently, the study only asks participants to identify a target odor from the odors of two same-sex strangers. The rationale for not having a strange, opposite-sex odor is never discussed and could provide results that are more applicable to real life situations. Another aspect the authors do not take into consideration the level of romantic love felt by the male in the relationship, which could serve to act as more accurate representation of the overall level of romantic love felt by both partners. Finally, the authors do not state the actual method by which they exposed participants to odors; they only state the type of test being done. Did they have the participants smell the odor pads directly or where they cut up into pieces and then exposed?

The methods of collecting odor samples have recently become under more scrutiny, and this study is no exception. Firstly, odor collection could have been under more control. Participants could have been kept under constant supervision in a clean room, although the feasibility of such an experiment is extremely low. On the other hand, preventing participants from undertaking their natural routine might detract from their natural odor. For instance, a certain diet might produce a specific odor, the removal of which changes the natural odor. Furthermore, what odor is being identified by the women? If there is a relative lack of control, could the women be identifying a particular brand of deodorant or perfume that a participant regularly uses instead of a natural odor cue? To that extent, could the nature of an odor cue change depending on the relationship status of the person giving off the cue? These types of problems arise when there is a relative lack in the definition of what is being tested.

The physical collection of odors in studies of similar nature lacks a common methodology leading to a drastic skew in results. In a recent study by Havlíček et al. 2011, it was shown that during collection of odors on to a cotton pad, some of the under-arm micro flora is transferred onto the pad. The micro flora have the ability to alter odors emitted from the pad,

depending on the duration in which the pad is left to collect odors. Pads that are left to collect over shorter periods of time are rated as more attractive, while pads left to collect longer are rated as being more masculine. As the pads in this study where used every night and then left in a zip-lock bag to be reused again the next over the course of a week, considerable changes to the odor in the pad may have occurred.

The paper concludes with a biological hypothesis for the mechanisms involved in romantic love and how these mechanisms support the findings of the study. Although this hypothesis may be correct, the study does not deal with the measurement of neuropeptides and therefore it should not be making inferences towards them.

In conclusion, this study attempts to correlate the extremely complex human emotion of romantic love with the identification of body odors. The relatively small size of the study and fact that our senses work in coordination with each other and it is hard to say that olfaction alone can be accurately used to identify someone, make it hard to apply this study to a broader scale. Also, the methods involving the collection of odors can be vastly improved upon. In the future, studies may look to measure levels of oxytocin and vasopressin in relation to romantic love, as mentioned in the paper. Ultimately, these studies might be forever limited in their lack of definition towards romantic love, for as the singer Haddaway best said, “What is love?”.

References:

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