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The scent of a loved one makes the heart beat faster

A study by researchers at the University of Freiburg investigates how the scent of one's partner influences stress reactions. The study participants showed that the subconsciously perceived scent of their respective partners increased their subjective perception of stress and caused their heart rate to rise, especially when the scent was perceived as sexually attractive.

In a relationship, the presence of a loved one can provide comfort and reduce stress. But does their subconsciously perceived scent also have a stress-relieving effect? A research team led by Prof. Dr Markus Heinrichs, Dr Franny B. Spengler and Dr Johannes T. Doerflinger from the Institute of Psychology at the University of Freiburg investigated this question. Their study shows that the body odour of a familiar person not only influences subjective stress perception and heart rate, but can even intensify them – depending on how attractive the scent is perceived to be. The study thus provides the first systematic evidence in humans that the subconsciously perceived scent of a partner can increase stress reactions. The results have been published in the Nature journal Scientific Reports.

The scent of one's partner does not replace his or her physical presence

In a laboratory study conducted under strictly controlled experimental conditions, researchers subjected 179 adults (91 women, 88 men) in stable, heterosexual relationships to a standardised psychosocial stress test. During the test, participants were exposed to either the natural body odour of their respective partners or a neutral control odour via a computer-controlled olfactometer – a device for dispensing odours. The researchers presented the scents below the subjective perception threshold so that the participants could not consciously recognise which odour they were actually smelling.

When exposed to their partner's scent, both men and women reported feeling more stressed, especially at the beginning of the stress test. At the same time, their heart rates increased significantly – a typical sign of heightened physical arousal. This effect was amplified by the subjective perception of the scent: the more attractive the participants rated their partner's scent, the more their heart rates increased. In contrast, the researchers found no difference between the partner's scent and the control scent in terms of the stress hormone cortisol.

"We initially expected that the scent would have an stress-buffering effect, similar to that shown for physical closeness in couples. Instead, the analysis of the data shows that the scent does not reduce stress levels, but actually increases nervousness and agitation."
Prof. Dr Markus Heinrichs, Study leader and Professor of Biological Psychology, Clinical Psychology and Psychotherapy at the Institute of Psychology at the University of Freiburg

The scent of partners does not replace their presence. "We initially expected that the scent would have a stress-buffering effect, similar to that shown for physical closeness in couples," explains Heinrichs, study leader and Professor of Biological Psychology, Clinical Psychology and Psychotherapy at the Institute of Psychology at the University of Freiburg. "Instead, the analysis of the data shows that the scent does not reduce stress levels, but actually increases nervousness and agitation."

Misperception or evolutionary advantage?

The result contradicts the widespread assumption that the scent of a partner automatically has a calming effect. The researchers see various possible explanations for this phenomenon. "We know that both stress and sexual arousal cause an increased heart rate. It could therefore well be that the increase in heart rate when presented with the partner's scent is caused by sexual arousal and misinterpreted as stress by the participants in the experiment," explains Doerflinger, one of the two lead authors and a research assistant at the Institute of Psychology at the University of Freiburg.

Lead author Spengler, a former research assistant at the Institute of Psychology at the University of Freiburg, adds an alternative explanation. "From an evolutionary perspective, it could make sense to react more strongly to stress when a subconscious smell signals the presence of my partner. In potentially threatening or challenging situations, an increased

cardiovascular response can help mobilise resources – whether to protect the person or to impress them."

Publication
Spengler, F. B.*, Doerflinger, J. T.*, Noel, J. A., Ditzen, B., Freiherr, J. & Heinrichs, M. (2026). Smelling the romantic partner's natural body odor increases psychological and autonomic but not cortisol stress responses. *Scientific Reports*, 16(1), 1760. *equal contribution

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Further information

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