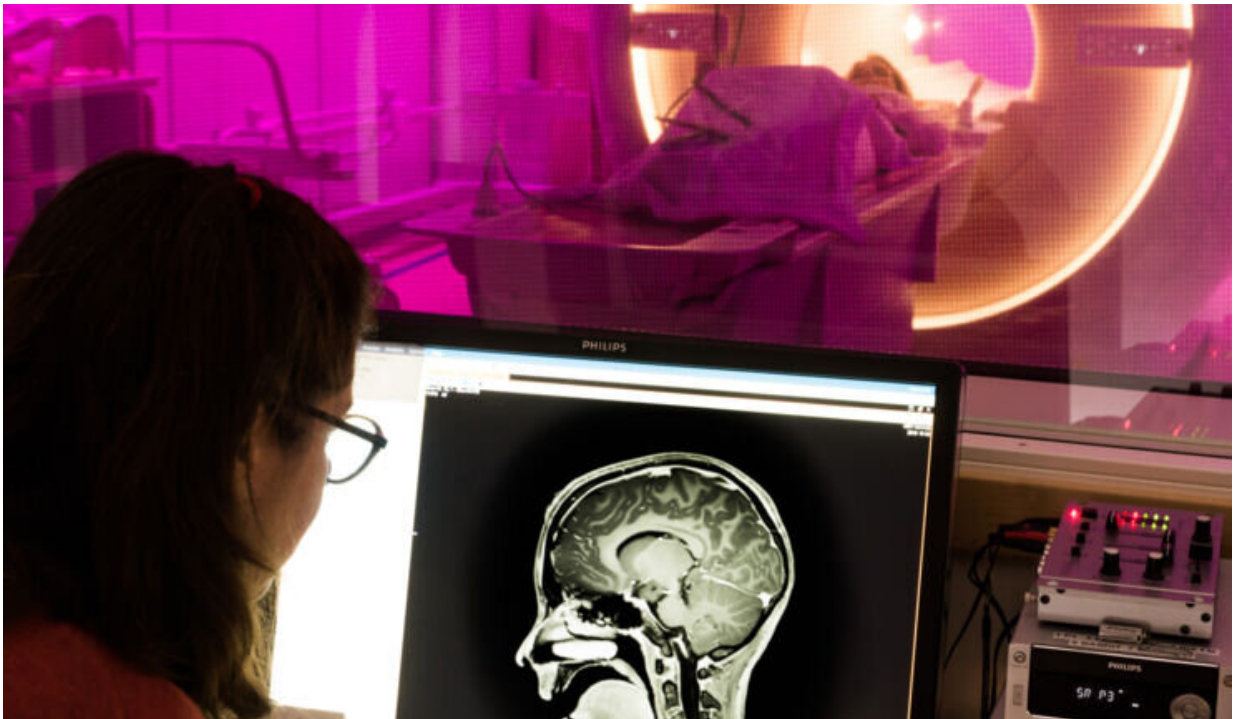


# Study finds the brain reacts differently to touch depending on context

May 9 2023, by Karin Söderlund Leifler

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Credit: Thor Balkhed/Linköping University

The touch of another person may increase levels of the "feel-good" hormone oxytocin. But the context really matters. The situation impacts oxytocin levels not only in the moment, but also later, as is shown by researchers at Linköping University and the University of Skövde in Sweden. Their study has been published in the journal *eLife*.

An embrace from a parent, a warm hand on your shoulder or a caress from a [romantic partner](#) are examples of how touch can strengthen [social bonds](#) between people and influence emotions. But although touch and the sense of touch have a very important function, knowledge of how this actually works is still lacking.

Studies in animals have shown that the [hormone oxytocin](#) is linked to touch and social bonding. However, many questions remain unanswered when it comes to [oxytocin](#)'s role in human social interactions and how this hormone can influence and be influenced by the brain. To study this more closely, researchers have examined what happens in the body when we feel a soft touch.

"We saw that the body's oxytocin response to touch was influenced by the situation: What had happened a few moments earlier and with whom the interaction takes place. The hormone does not function like an on/off button, but more like a dimmer switch," says India Morrison, senior associate professor at the Department of Biomedical and Clinical Sciences at Linköping University.

Forty-two women took part in the study, published in *eLife*. The actual experiment consisted of the woman's male partner stroking her arm with his hand, while her [brain activity](#) was monitored using [functional magnetic resonance imaging](#), fMRI.

The experiment also involved repeatedly taking blood tests to see whether oxytocin levels in the woman's blood changed over time. Combining the various measurements allowed the researchers to examine whether [hormone levels](#) were linked to brain activity.

The measurements from the [social interaction](#) between the woman and her partner were compared with what happened when instead an unknown, non-threatening man touched her arm in the same way. In half

of the experiments, her partner was the first to stroke her arm, and in the other half it was the stranger. The participating women were informed of who was stroking their arm.

"Our basic question was whether oxytocin levels would be higher when the woman's partner touched her arm than when a stranger did it. The answer was yes, but only when her partner was the first to stroke her arm," says India Morrison.

The researchers found that when her partner was first, the women's oxytocin levels increased during the social interaction, then fell, only to increase again when the stranger did the same thing. However, when the stranger touched her first, there was no change in oxytocin levels. And when her partner then stroked her arm, there was only a slight increase. The changes in [oxytocin levels](#) were linked to activity in regions of the brain important for the contextualization of events.

Oxytocin is released in a variety of situations and has several functions in the body.

"It might be good to bear in mind that context matters, for instance when providing synthetic oxytocin in the form of a nasal spray as part of the treatment of mood-affecting conditions," says India Morrison.

**More information:** Linda Handlin et al, Human endogenous oxytocin and its neural correlates show adaptive responses to social touch based on recent social context, *eLife* (2023). [DOI: 10.7554/eLife.81197](https://doi.org/10.7554/eLife.81197)

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