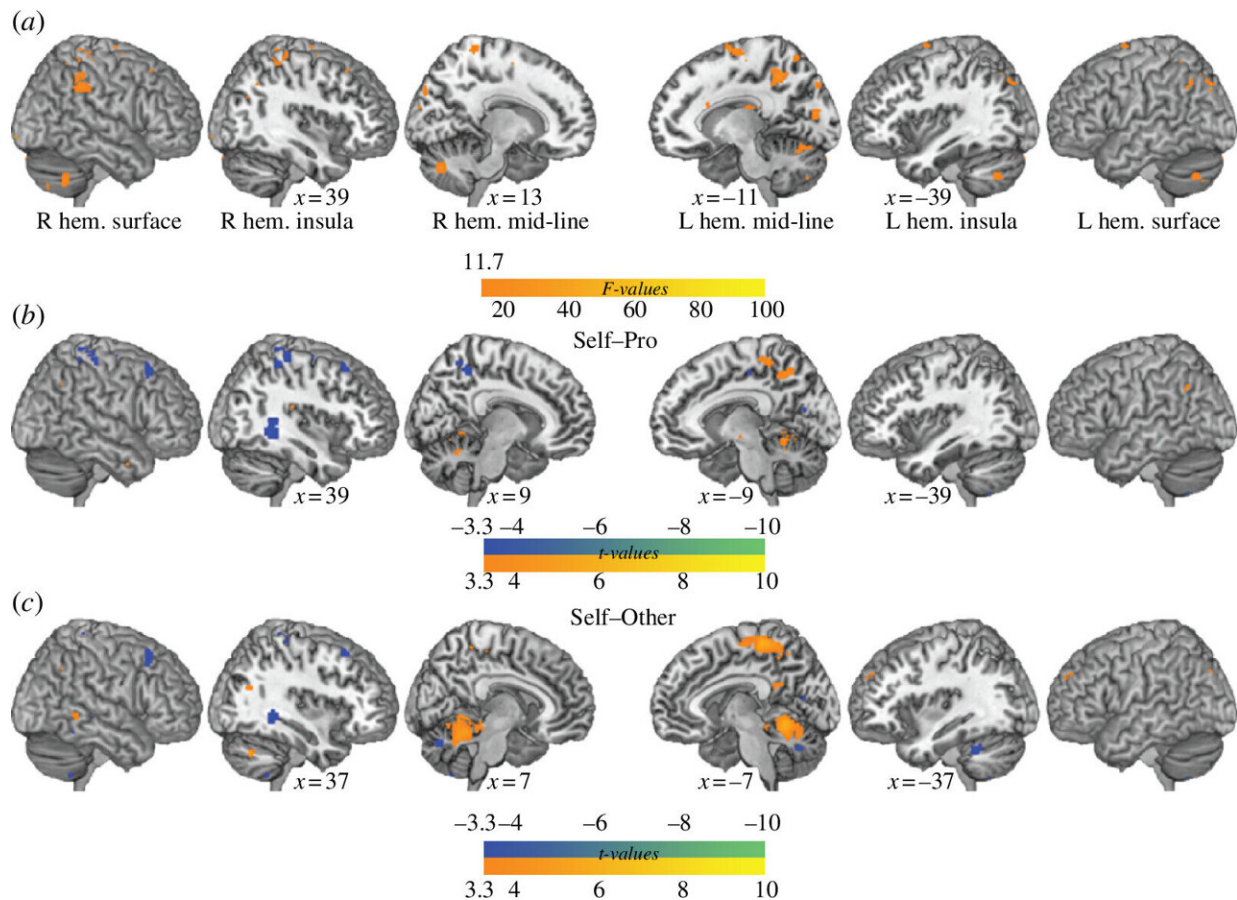


Researchers use MRI scans and karaoke to better understand the nature of blushing

July 17 2024, by Bob Yirka



Associations between task activity and individual differences in blushing as indexed by cheek temperature increase. (a) Regions with parameter estimates for watching singing associated with individual differences in cheek temperature changes. (b–c) Regions with significant differences in association with individual differences in cheek temperature change as a function of the singer. Credit: *Proceedings of the Royal Society B: Biological Sciences* (2024). DOI: 10.1098/rspb.2024.0958

A small team of psychologists and neurologists from the University of Amsterdam, in the Netherlands, and D'Annunzio University of Chieti–Pescara, in Italy, has found that blushing may be more related to an increase in emotional awareness and what a person is doing, rather than feelings of judgment by others.

In their study, [published](#) in the journal *Proceedings of the Royal Society B: Biological Sciences*, the researchers asked a group of teens and 20-somethings to experience an embarrassing event during brain scans via MRI.

Most people have experienced blushing events and observed them in others. Blushing is a reddening caused by increased [blood flow](#) to the cheeks, and sometimes the whole face, ears and chest. Anecdotal evidence suggests such experiences are closely tied to feelings of exposure and/or embarrassment. But why people blush and the processes involved have never been explained.

In this new study, the research team investigated the phenomenon by recruiting 40 people—teens and those in their early 20s—to be recorded singing a karaoke song. The researchers conducted MRI scans during the performances.

To further ensure embarrassment, the researchers told the volunteers that others would be watching and listening to the performance. The research team also gave the volunteers only four song choices, all of which had been chosen for their high level of difficulty.

The research team then analyzed the MRI images and also compared them to others in the volunteer group, looking for the source of blushing that inevitably occurred.

The researchers were able to determine when the volunteers were blushing based on a rise in skin temperature on the faces of the volunteers. They also found brain pattern similarities in the volunteers during blushing events, noting increased activity generally associated with emotional arousal and self-focused attention.

Notably lacking was any sign of increased activity in parts of the brain typically observed when imagining their own or someone else's behavior. Such patterns, the research team points out, suggest that blushing is more strongly tied to how a person perceives themselves rather than how they think others might be perceiving them—a finding that coincides with reports of people who have admitted blushing when they are alone.

More information: Milica Nikolić et al, The blushing brain: neural substrates of cheek temperature increase in response to self-observation, *Proceedings of the Royal Society B: Biological Sciences* (2024). [DOI: 10.1098/rspb.2024.0958](https://doi.org/10.1098/rspb.2024.0958)

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