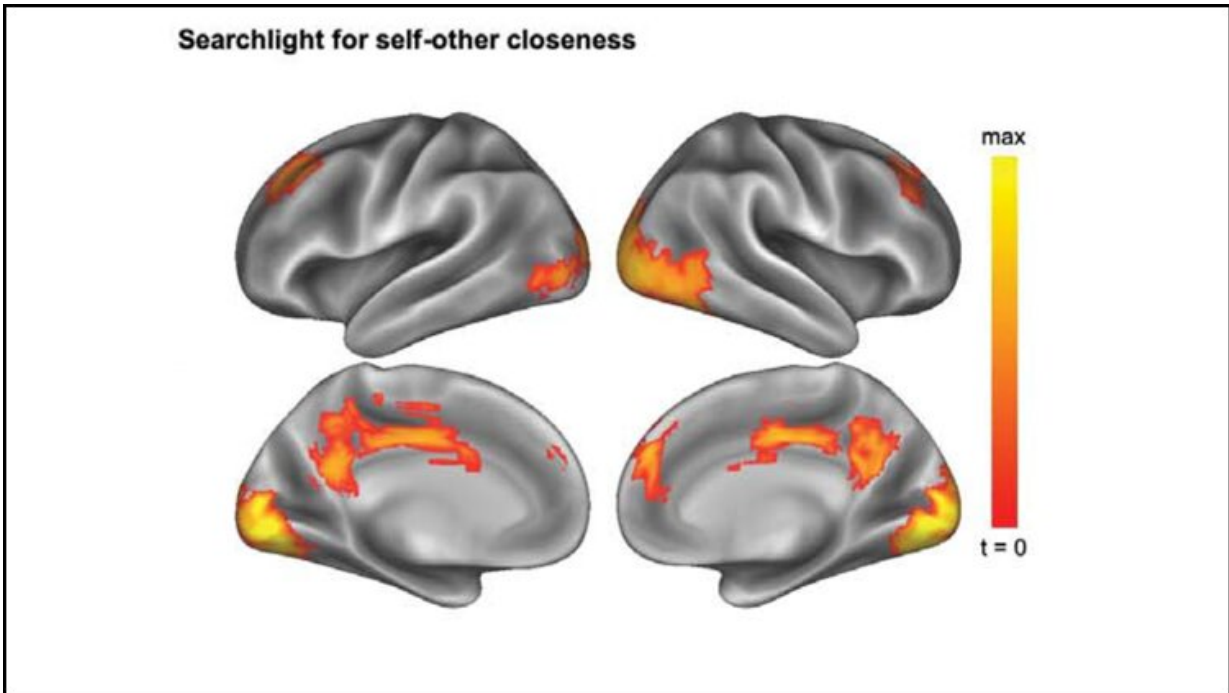


Your brain shows if you are lonely or not

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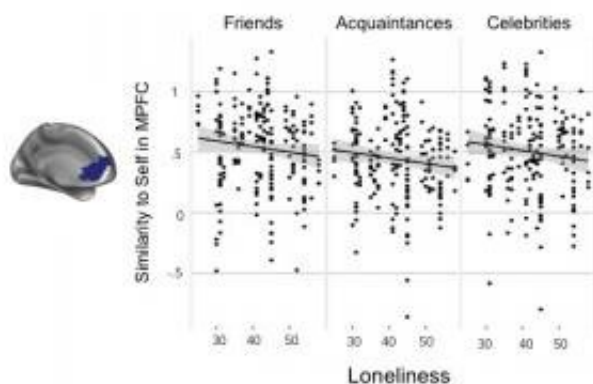
The activity patterns of these brain regions reflect self-other closeness: the closer the relationship, the more the patterns resemble each other. Credit: Courtney and Meyer, *JNeurosci* 2020

Social connection with others is critical to a person's mental and physical well-being. How the brain maps relationships with other people in relation to one's self has long been a mystery. A Dartmouth study finds that the closer you feel to people emotionally, the more similarly you represent them in your brain. In contrast, people who feel social

disconnection appear to have a lonelier, neural self-representation. The findings are published in the *Journal of Neuroscience*.

"If we had a stamp of neural activity that reflected your self-representation and one that reflected that of people whom you are close to, for most of us, our stamps of neural activity would look pretty similar. Yet, for lonelier people, the neural activity was really differentiated from that of other people," explained senior author Meghan L. Meyer, an assistant professor of psychological and brain sciences, and director of the Dartmouth Social Neuroscience Lab.

The study was comprised of 50 college students and community members ranging from age 18 to 47. Before going in an fMRI scanner, participants were asked to name and rank five people whom they are closest to and five acquaintances. During the scan, participants were asked to make trait judgements about themselves, the people they are closest to and the acquaintances that they had just named, and five celebrities. Participants were asked to rate how much a trait described a person (such as if the person is friendly) on a scale from 1 to 4 (from not at all to very much).



Loneliness was associated with lower self-other similarity in the medial prefrontal cortex (MPFC). Less self-other similarity in MPFC with greater

loneliness was observed when participants thought about either their friends, acquaintances, or celebrities. Credit: Andrea L. Courtney and Meghan L. Meyer

The results showed how the brain seemed to cluster representations of people into three different cliques: 1) oneself, 2) one's own social network, and 3) well-known people, like celebrities. The closer participants felt to someone, the more similarly their brain represented them throughout the social brain, including in the [medial prefrontal cortex](#) (MPFC), the region associated with the concept of self. Lonelier people showed less neural similarity between themselves and others in the MPFC, and the demarcations between the three cliques was blurrier in their neural activity. In other words, the lonelier people are, the less similar their brain looks when they think about themselves and others.

Meyer added, "It's almost as if you have a specific constellation of neural activity that is activated when you think about yourself. And when you think about your friends, much of the same constellation is recruited. If you are lonely though, you activate a fairly, different constellation when you think about others than when you think about yourself. It's as though your [brain](#)'s representation of yourself is more disconnected from other people, which is consistent with how lonely people say they feel."

The findings illustrate how loneliness seems to be associated with distortions in the neural mapping of social connections with others.

More information: Self-Other Representation in the Social Brain Reflects Social Connection, *JNeurosci* (2020). [DOI: 10.1523/JNEUROSCI.2826-19.2020](https://doi.org/10.1523/JNEUROSCI.2826-19.2020)

Provided by Dartmouth College

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