What your friends' brains look like when they think of you

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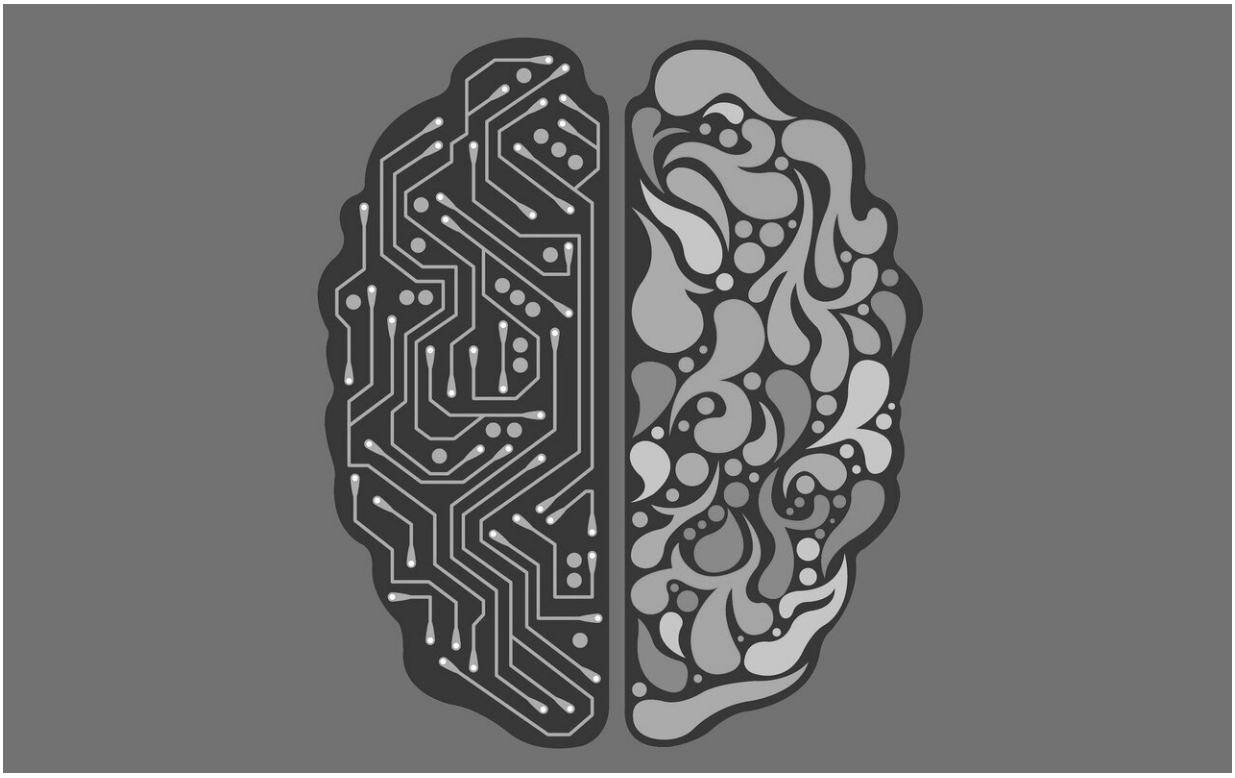

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If you ever wondered what's going on in your friends' brains when they think about you, new research may provide a clue.

It turns out that the brain activity patterns found in your friends' brains

when they consider your personality traits may be remarkably similar to what is found in your brain when you think of yourself, the study suggests.

Those same friends will have a different brain activity pattern when they think of someone else in your group—and more in alignment with that person's pattern, findings indicate.

It was somewhat surprising to see the close similarity in brain patterns between individuals and their friends, said Dylan Wagner, co-author of the study and assistant professor of psychology at The Ohio State University.

"It didn't have to be that way. We thought it was equally possible that you would think of me in the same way as I think of myself, but the way your brain encodes that information could be totally different," Wagner said.

The study was led by Robert Chavez, an assistant professor of psychology at the University of Oregon, who did the work as a postdoctoral researcher at Ohio State. Their research was published online recently in the *Journal of Personality and Social Psychology*: Attitudes and Social Cognition.

Chavez and Wagner made this finding using a research design that had rarely been used in functional neuroimaging experiments before. They recruited 11 people who were all friends with each other to varying degrees. ("They were a pretty tight-knit group from the same academic program who all spent time together at the university as well as outside of it," Wagner said.)

The novel part is that the researchers used a round-robin design in which everyone evaluated each other—and evaluated themselves—on a variety

of personality traits, Wagner said.

In one session, each participant rated each of the other 10 and themselves on a variety of personality traits in a written questionnaire.

In a separate session, the 11 participants conducted similar evaluations while in a functional magnetic resonance imaging (fMRI) scanner.

The fMRI took images of each person's brain while they completed a task similar to the one they did earlier. They rated each of their friends and themselves on 48 traits, including lonely, sad, cold, lazy, overcritical, trustworthy, enthusiastic, clumsy, fashionable, helpful, smart, punctual and nice.

As they expected from previous research, the researchers saw activity in the medial prefrontal cortex, a part of the brain implicated in thinking about the self and close others, as the participants thought about the personality traits of themselves and their friends.

The study found that for each participant, the combined brain activity of their friends evaluating them looked a lot like their own brain activity.

This suggests that order to accurately perceive another person, your neural representation of that person—your patterns of brain activity for their identity—has to essentially match the pattern in that persons' brain when they are thinking about themselves, Wagner said.

The researchers note, however, that their data only suggest this in aggregate, as the analysis focused on taking the brain patterns of all a person's friends and averaging them together, an approach commonly taken in non-fMRI personality research when comparing friends' consensus judgments of each other.

In some ways, that is not surprising, Chavez said.

"Each one of your friends gets to see a slightly different side of you. When you put them all together, it is a better approximation of how you seen yourself than any one person individually," Chavez said.

More information: Robert S. Chavez et al. The neural representation of self is recapitulated in the brains of friends: A round-robin fMRI study., *Journal of Personality and Social Psychology* (2019). DOI: 10.1037/pspa0000178

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