

Brain connectivity reveals hidden motives

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To understand human behaviors, it is crucial to understand the motives behind them. So far, there was no direct way to identify motives. Simply observing behavior or eliciting explanations from individuals for their actions will not give reliable results as motives are considered to be private and people can be unwilling to unveil - or even be unaware of - their own motives. Psychologist and neuroscientist Grit Hein and Ernst Fehr from the Department of Economics, University of Zurich teamed up with Yosuke Morishima, Susanne Leiberg, Sunhae Sul and found that the way relevant brain regions communicate with each other is altered depending on the motives driving a specific behavioral choice. This interplay between brain regions allowed them to identify the underlying motives. These motives could not be uncovered by observing the person's choices, or based on the brain regions that are activated during the decision-making.

Connections between brain regions linked to motives

During the study, participants were placed in an fMRI scanner and made altruistic decisions driven by an empathy motive (the desire to help a person for whom one feels empathy) or a reciprocity motive (the desire to reciprocate an individual's previous kindness). Simply looking at the functional activity of specific regions of the brain couldn't reveal the motive underlying the decisions. Broadly speaking, the same areas in the brain lit up in both settings. "However, using Dynamic Causal Modeling (DCM) analyses, we could investigate the interplay between these [brain regions](#) and found marked differences between empathy- based and reciprocity-based decisions", explains Grit Hein. "The impact of the

[motives](#) on the interplay between different brain regions was so fundamentally different that it could be used to classify the motive of a person with high accuracy" she continues.

Empathy motive increases altruistic behavior in selfish people

A further important result was that motives are processed differently in selfish and prosocial people. In selfish people, the empathy but not the reciprocity motive increased the number of altruistic decisions. After activating the empathy motive, selfish individual resembled persons with prosocial preferences in terms of brain connectivity and [altruistic behavior](#). In contrast, prosocial people behaved even more altruistically after activating the reciprocity, but not the empathy motive.

More information: Grit Hein, Yosuke Morishima, Susanne Leiberg, and Ernst Fehr. The brain's functional network architecture reveals human motives. *Science*. March 3, 2016. [DOI: 10.1126/science.aac7992](https://doi.org/10.1126/science.aac7992).

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