

Brain center for social choices discovered in a poker study

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Although many areas of the human brain are devoted to social tasks like detecting another person nearby, a new study has found that one small region carries information only for decisions during social interactions. Specifically, the area is active when we encounter a worthy opponent and decide whether to deceive them.

A brain imaging study conducted by researchers at the Duke Center for Interdisciplinary Decision Science (D-CIDES) put human subjects through a functional [MRI brain scan](#) while playing a simplified game of poker against a computer and human opponents. Using [computer algorithms](#) to sort out what amount of [information](#) each area of the brain was processing, the team found only one brain region -- the temporal-

parietal junction, or TPJ --- carried information that was unique to decisions against the human opponent.

Some of the time, the subjects were dealt an obviously weak hand. The researchers wanted to see whether they could watch the player calculate whether to bluff his opponent. The [brain signals](#) in the TPJ told the researchers whether the subject would soon bluff against a human opponent, especially if that opponent was judged to be skilled. But against a computer, signals in the TPJ did not predict the subject's decisions.

The TPJ is in a boundary area of the brain, and may be an intersection for two streams of information, said lead researcher McKell Carter, a postdoctoral fellow at Duke. It brings together a flow of attentional information and biological information, such as "is that another person?"

Carter observed that in general, participants paid more attention to their [human](#) opponent than their computer opponent while playing poker, which is consistent with humans' drive to be social.

Throughout the poker game experiment, regions of the brain that are typically thought to be social in nature did not carry information specific to a social context. "The fact that all of these [brain regions](#) that should be specifically social are used in other circumstances is a testament to the remarkable flexibility and efficiency of our brains," said Carter.

"There are fundamental neural differences between decisions in social and non-social situations," said D-CIDES Director Scott Huettel, the Hubbard professor of psychology & neuroscience at Duke and senior author of the study. "Social information may cause our brain to play by different rules than non-social information, and it will be important for both scientists and policymakers to understand what causes us to approach a decision in a social or a non-social manner.

"Understanding how the [brain](#) identifies important competitors and collaborators -- those people who are most relevant for our future behavior -- will lead to new insights into social phenomena like dehumanization and empathy," Huettel added.

The study, supported by National Institutes of Health, appears in the July 6 *Science*.

More information: "A Distinct Role of the Temporal-parietal Junction in Predicting Socially Guided Decisions," R. McKell Carter, Daniel L. Bowling, Crystal Reeck, and Scott A. Huettel, *Science*, July 6, 2012. DOI 10.1126/science.1219681

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