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Scanning the brain: Scientists examine the impact of fMRI over the past 20 years

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Understanding the human brain is one of the greatest scientific quests of all time, but the available methods have been very limited until recently. The development of functional magnetic resonance imaging (fMRI)—a tool used to gauge real-time brain activity by measuring changes in blood flow—opened up an exciting new landscape for exploration.

Now, twenty years after the first fMRI study was published, a group of distinguished psychological scientists reflect on the contributions fMRI has made to our understanding of human thought. Their reflections are published as part of a special section of the January 2013 issue of Perspectives on Psychological Science, a journal of the Association for Psychological Science.

In the last two decades, many researchers have used fMRI to try to answer various questions about the brain and mind. But some are not convinced of its usefulness.

"Despite the many new methods and results derived from fMRI research, some have argued that fMRI has done very little to advance knowledge about cognition and, in particular, has done little to advance theories about cognitive processes," write Mara Mather, Nancy Kanwisher, and John Cacioppo, editors of the special section.

The aim of the special section is to tackle the question of how fMRI results have (or have not) changed the way we think about human psychology and the brain, resulting in a collection of 12 provocative

articles.

Some of the authors argue that fMRI has fundamentally changed that way that researchers think about the aging mind. According to researchers Tor Wager and Lauren Atlas, fMRI may also provide a more direct way of measuring pain.

Others discuss the contributions fMRI has made to the longstanding debate about whether cognitive operations are modular or distributed across domains. And some emphasize the reciprocal relationship between fMRI and cognitive theories, highlighting how each informs the others.

As appealing as fMRI images might be, researchers Martha Farah and Cayce Hook find little support for the claim that fMRI data has a "seductive allure" that makes it more persuasive than other types of data.

In their concluding commentary, Mather, Cacioppo, and Kanwisher argue that fMRI does provide unique insights to our understanding of cognition. But, as powerful as it is, the researchers acknowledge that there are some questions fMRI will never answer.

"The best approach to answering questions about cognition," say Mather, Cacioppo, and Kanwisher, "is a synergistic combination of behavioral and neuroimaging methods, richly complemented by the wide array of other methods in cognitive neuroscience."

More information: *Perspectives on Psychological Science*: Volume 8, Number 1. pps.sagepub.com/content/current

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