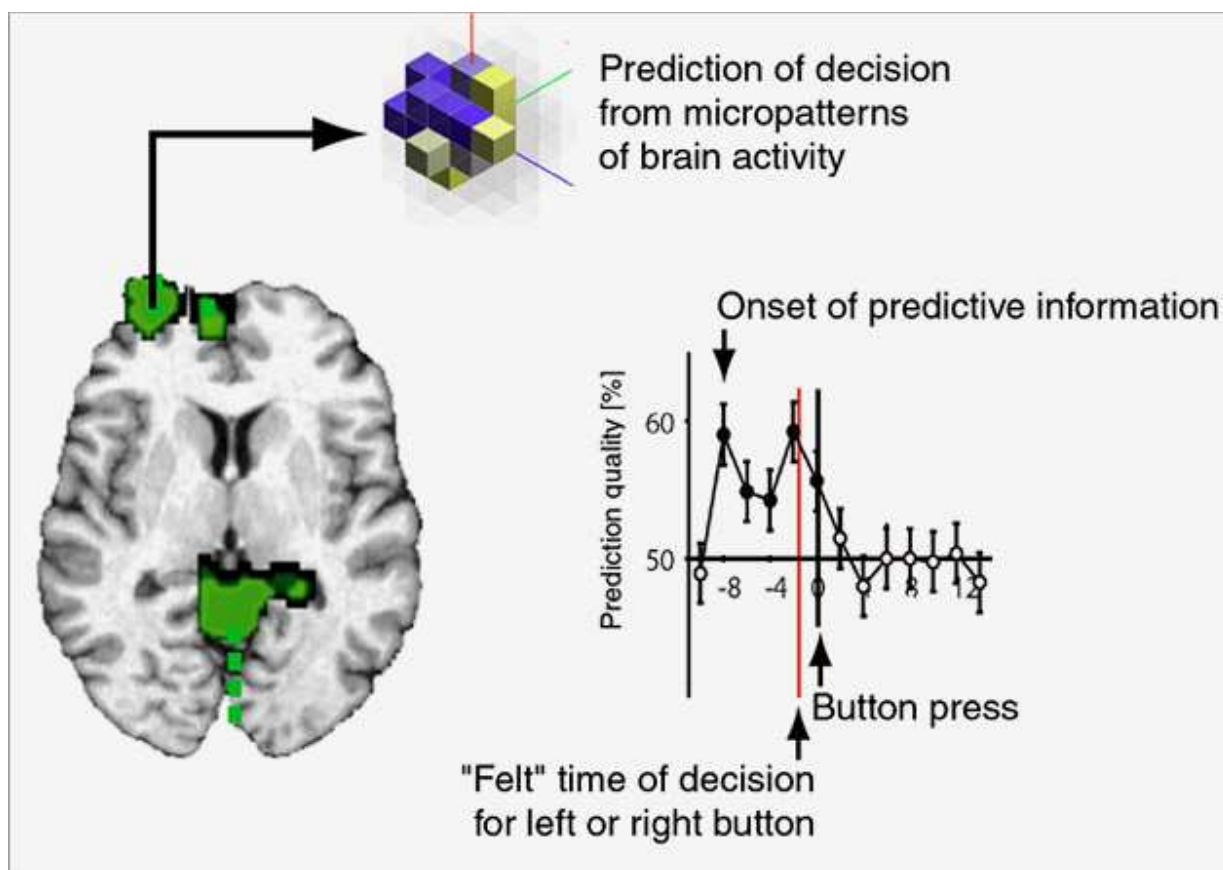


# Brain Scanners Can See Your Decisions Before You Make Them

By Brandon Keim 04.13.08



This schematic shows the brain regions (green) from which the outcome of a participant's decision can be predicted before it is made. *Courtesy John-Dylan Haynes.*

You may think you decided to read this story -- but in fact, your brain made the decision long before you knew about it.

In a study published Sunday in *Nature Neuroscience*, researchers using brain scanners could predict people's decisions seven seconds before the test subjects were even aware of making them.

The decision studied -- whether to hit a button with one's left or right hand -- may not be representative of complicated choices that are more integrally tied to our sense of self-direction. Regardless, the findings raise profound questions about the nature of self and autonomy: How free is our will? Is conscious choice just an illusion?

"Your decisions are strongly prepared by brain activity. By the time consciousness kicks in, most of the work has already been done," said study co-author [John-Dylan Haynes](#), a Max Planck Institute neuroscientist.

Haynes updated a classic experiment by the late [Benjamin Libet](#), who showed that a brain region involved in coordinating motor activity fired a fraction of a second before test subjects chose to push a button. Later studies supported Libet's theory that subconscious activity preceded and determined conscious choice -- but none found such a vast gap between a decision and the experience of making it as Haynes' study has.

In the seven seconds before Haynes' test subjects chose to push a button, activity shifted in their frontopolar cortex, a brain region associated with high-level planning. Soon afterwards, activity moved to the parietal cortex, a region of sensory integration. Haynes' team monitored these shifting neural patterns using a functional MRI machine.

Taken together, the patterns consistently predicted whether test subjects eventually pushed a button with their left or right hand -- a choice that, to them, felt like the outcome of conscious deliberation. For those accustomed to thinking of themselves as having free will, the implications are far more unsettling than learning about the physiological basis of other brain functions.

Caveats remain, holding open the door for free will. For instance, the experiment may not reflect the mental dynamics of other, more complicated decisions.

"Real-life decisions -- am I going to buy this house or that one, take this job or that -- aren't decisions that we can implement very well in our brain scanners," said Haynes.

Also, the predictions were not completely accurate. Maybe free will enters at the last moment, allowing a person to override an unpalatable subconscious decision.

"We can't rule out that there's a free will that kicks in at this late point," said Haynes, who intends to study this phenomenon next. "But I don't think it's plausible."

That implausibility doesn't disturb Haynes.

"It's not like you're a machine. Your brain activity is the physiological substance in which your personality and wishes and desires operate," he said.

The unease people feel at the potential unreality of free will, said National Institutes of Health neuroscientist [Mark Hallett](#), originates in a misconception of self as separate from the brain.

"That's the same notion as the mind being separate from the body -- and I don't think anyone really believes that," said Hallett. "A different way of thinking about it is that your consciousness is only aware of some of the things your brain is doing."

Hallett doubts that free will exists as a separate, independent force.

"If it is, we haven't put our finger on it," he said. "But we're happy to keep looking."

Read the original Wired Article at

[http://www.wired.com/science/discoveries/news/2008/04/mind\\_decision](http://www.wired.com/science/discoveries/news/2008/04/mind_decision)