
New Findings on Free Will

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Neuroscience is a vast field, but in the end the whole enterprise is motivated by a few central questions. One of them is, "Do we have free will?" A new study, published in the journal *Neuron*, has shed a little more light on that question. It suggests that we might need to rethink what "free will" really means.

Until now, the most important finding about free will has come from the famous "Libet experiment," devised by Benjamin Libet in 1983. Libet sat you in a chair, stuck electrodes on your head, and put a clock and a button in front of you. Whenever you felt like it, you could push the button; your only task was to notice when, according to the clock, you'd decided to push it. Libet found that your neurons started firing well in advance of your conscious decision-making: The surge in activity, or "readiness potential," started forming almost a full second before "W," your experienced moment of decision. W, Libet suggested, wasn't the present-tense sensation of making a decision, but the past-tense sensation of already having made one. This felt, to many observers, like a blow struck against the idea of free will.

Libet's experiment was thought-provoking, but imprecise. The followup study, by Itzhak Fried, Roy Mukamel, and Gabriel Kreiman, leverages new technologies that allow neuroscientists to monitor individual neurons, rather than huge brain regions. It also takes advantage of new clinical situations. Nowadays, super-small electrodes are sometimes inserted deep into the brains of epilepsy patients during pre-surgery diagnostic tests. Fried, Mukamel, and Kreiman asked these patients to perform a version of the Libet experiment.

What did they find? First, they discovered that W, the sensation of 'making a decision,' is correlated with activity in the motor areas of the brain -- not in some specific decision-making area. Second, they found that the W moment involves decreases in brain activity, as well as increases. Writing in *Neuron*, Patrick Haggard, a neuroscientist, argues that it's now "wrong to think of W as a prior intention, located at the very earliest moment of decision in an extended action chain. Rather, W seems to mark an intention-in-action, quite closely linked to action execution.... [occurring when] the brain transforms a prior plan into a motor act." The decreases in neural activity before W, meanwhile, suggest that the brain is set up to "tonically inhibit unwanted actions": the sensation of making a decision might not be about hatching a new plan, but about green-lighting one of many competing impulses.

What does all this suggest for the question of whether free will exists? That's probably the wrong question to ask. What the study does do is illuminate what "free will" really means. "Free will" isn't about some disembodied, hypothetical, abstract process of choosing; it's more about doing. Choosing -- at least in simple, immediate situations -- isn't about thinking a decision; it's about enacting one. With this in mind, it's a little less weird that the sensation of making a decision and the moment of enacting it are so closely linked.

So it looks as though our ideas about free will might need to change in a subtle way. That doesn't mean, though, that free will is going anywhere; in fact, there are many contexts in which we already understand free will this way. At Wimbledon this week, we'll be seeing top athletes playing at the highest levels: With every point, they'll be making split-second decisions not that dissimilar from the Libet decision. Clearly, those decisions will be made in a high-speed dance between body and brain. And yet we would never say that, because his body is involved in his decisions, an athlete doesn't have free will. Of course Roger Federer uses his body when he makes choices -- he's an athlete! So, it appears, are the rest of us.