



A new research program on free will teams up neuroscientists and philosophers. ISTOCK.COM/RUDALL30

## Philosophers and neuroscientists join forces to see whether science can solve the mystery of free will

By **Bahar Gholipour** | Mar. 21, 2019 , 11:05 AM

Philosophers have spent millennia debating whether we have free will, without reaching a conclusive answer. Neuroscientists optimistically entered the field in the 1980s, armed with tools they were confident could reveal the origin of actions in the brain. Three decades later, they have reached the same conclusion as the philosophers: Free will is complicated.

Now, **a new research program** spanning 17 universities and backed by more than \$7 million from two private foundations hopes to break out the impasse by bringing neuroscientists and philosophers together. The collaboration, the researchers say, can help them tackle two important questions: What does it take to have free will? And whatever that is, do we have it?

Neuroscience's first and most famous encounter with free will occurred in 1983, when physiologist Benjamin Libet made a peculiar discovery. A brain signal called the readiness potential was known to precede self-initiated actions, such as raising a hand or spontaneously tapping a finger. Libet found the readiness potential starts to rise before people report they are aware of their decision to move. Many took that as a challenge to the existence of free will. But subsequent studies argued that was a flawed interpretation, and that the results said little about free will.

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The eight neuroscientists and nine philosophers involved in the new program pledge to do better this time around by asking more precise questions and designing philosophically informed experiments. With the 4-year grant from the John Templeton Foundation in West Conshohocken, Pennsylvania, and the Fetzer Institute in Kalamazoo, Michigan, the team plans to study how the brain enables conscious control of decisions and actions. Overall, it hopes to establish a new field in the study of the brain: the neurophilosophy of free will.

Last weekend, as part of the launch of the program, 90 researchers from 40 universities gathered at **the International Conference on the Neuroscience of Free Will**, held at Chapman University's Brain Institute in Irvine, California. *Science* spoke with project leader **Uri**

**Maoz**, a psychologist and computational neuroscientist at Chapman, about how the new effort aims to change the future of free will research.

**Q: Scientists have been studying free will for more than 3 decades. Have they made any progress?**

**A:** Libet's study was the paper that spawned a thousand papers and launched the field. But there was a lot of criticism against Libet's findings. I think what individual scientists have done since was to try to chip away some of the criticism. They tried to answer questions such as does brain activity only predict *when* you are going to move a hand, or could it predict *which* hand you move? How early can you see the signal? Do these early predictive signals mean the decision has been made several seconds in advance? Or are they some kind of activity that biases the decision? So, I'd say two types of progress have been made. One is that we tried to elucidate which of the claims made in the original paper holds, what replicates and what doesn't. Second, we now know the question is much more complex and nuanced. That's one of the reasons we need our philosopher colleagues. They have been thinking about [free will] for many years.

**Q: How did the new research program come about?**

**A:** It's a bit of a funny story. Three years ago, Swedish scientist Hans Liljenström approached me about organizing a conference on free will. I thought it was a great idea because even though a few labs work on the topic, there was never a conference on the neuroscience and philosophy of free will. The funding was confirmed very late, just about 2 months before the conference date. Yet, almost everybody I invited found a way out of their busy schedule to make it to Sweden for the meeting. It was clear to me that there was a lot of enthusiasm in the field. And then as part of that conference, we went on a shrimp cruise. It's a popular Swedish activity, where you are given bowls after bowls of shrimp to peel and eat.

At some point when we were on that boat, somebody came over and said to me, "Do you realize that if this boat sinks, the field of the neuroscience of free will is going to sink with it?" Roughly everybody was there. And that kind of brought the idea that given so much enthusiasm, what if we approached one of the funding agencies to try and see if we can have a joint project with neuroscientists and philosophers.

**Q: Have the two fields collaborated before?**

**A:** Previously, different groups of philosophers and neuroscientists worked separately and once a year met and told each other what they were doing. That was good to start getting people interested in free will, but now we've gone past that. Now, we can start working together rather than each group in their own silos.

**Q: What would a collaboration between philosophers and neuroscientists look like?**

**A:** It is part and parcel of this grant that every project has at least two neuroscientists and at least one philosopher involved. It's written in the contract. What I expect philosophers to do is not sit there and analyze data. What I would hope to get from them is to first help in deciding what are the right questions to ask. What to investigate is not a scientific question. It's a theoretical or philosophical question. Then, if we agree on the question, how do we design the experiment that would answer exactly that question? Then, once the experiment is done, they help interpret what the results mean and produce joint publications.

Ultimately, we'd like to get at two questions. One is, what is required for people to have free will? That is a philosophical question that our philosopher colleagues should come to an agreement on. As a scientist, I don't know what it entails to have free will. Then there's the second question, which is, whatever that thing is that is required for free will, do we have that? Do humans possess that? This is an empirical question. It may be that I don't have the technology to measure it, but that is at least an empirical question that I could get at.

**Q: What questions are you asking?**

**A:** The important thing is that right now we are trying to go beyond Libet-type experiments. Rather than asking do we have free will, we are trying to get at more nuanced and better-defined questions. How does the brain enable conscious causal control of our actions and decisions? How do our conscious intentions lead to actions? A third question is about purposeful actions. We try to see whether the results of these Libet-type experiments [involving raising hands or moving fingers] generalize to more deliberate decisions, which philosophers would tell you are more pertinent to moral responsibility. Those are the ones we care about. Who would take you to court for raising your right hand and not your left for no reason and no purpose? It's meaningless. So, the fact that I can predict that based on some symmetry breaking signal in your brain ... well, can I also [predict your actions] if you're faced with a morally charged situation? Say, there's a car that's burning and a baby is inside. Are you going to run to the car, even though it might explode, or are you going to just stand there? Those are the kinds of decisions I think would be interesting to look into. Of course, we're not going to create that horrible kind of scenario, but things that mimic these types of decisions are what we've been trying to look at.

**Q: What do you mean when you say you hope this will create a new field of neurophilosophy of free will?**

**A:** I don't claim that no research has been done about this before, but what I'm trying to do is to bring people together more formally and try to think what a field requires. It requires conferences, for example, where people come together from time to time to talk specifically about the topic, instead of meeting at the sidelines of another conference, on vision or decision-making or consciousness, to talk about free will. We try to think of ways to get students engaged, as equal partners. We had a student-led session at this

conference, for example. We need to get younger people excited about this. Otherwise, the field stagnates and dies off. And it's a good idea to have students to get trained in the field by both neuroscientists and philosophers from the start.

**Q: Why do we need to study free will in the first place? And does what we may find have practical applications in neurology and law?**

**A:** As I always say, the first thing about doing basic science is that you should want to satisfy human curiosity because we never know what applications there could be in 10 years that we have not thought about right now. So, there is value in doing basic science for its own sake.

Second, it may well turn out that neuroscience is not able to completely tell us whether or not there is free will. But I think studying it is important because it teaches us about processes in the brain and how things like volition come about. That has implications for the legal system, for example, which distinguishes between voluntary and involuntary actions. It may also have implications for motor disorders like Parkinson's disease, where people have a hard time with self-initiated movements. If we understand more about how the brain produces self-initiated movements, we may be able to add another layer to the Parkinson's research. I would say the more we understand about the brain, the better we can do in many areas.

*\*Correction, 21 March, 3:25 p.m.: This story has been updated to correct the year of Benjamin Libet's discovery.*

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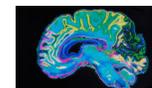
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