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Metaphysics special: Do we have free will?

Biology suggests we might not have free will, but everything changes when you get down to the quantum level



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By **Michael Brooks**

“DID I really just decide to have fish and chips for lunch?” Humans have been wrestling with such questions for millennia. Maybe not about the fish and chips, but about whether we are truly in control or whether some external agent – be that an omnipotent god or the laws of physics – predetermines the trajectory of our lives.

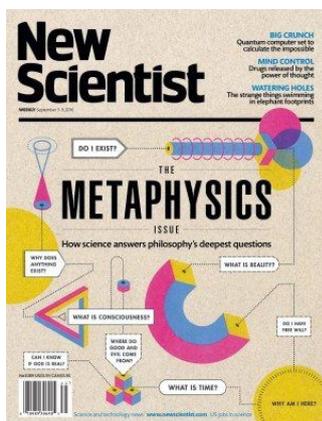
Unfortunately, there are no easy answers. Who is the “I” who decided to have fish and chips? Your gut reaction might tell you that you are a conscious entity controlling your physical body. But that physical body includes the brain that generates your consciousness. There is no splitting the two.

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We do know that any sense we have of being in control of our actions is, to some extent, an illusion. In particular, neuroscientist Benjamin Libet showed in the 1980s that mechanisms within the brain initiate actions long before that brain's owner is aware of deciding to perform them.

It's a big extrapolation to claim that all of our actions are outside our control. "Libet deals with the very short-term precursors of very simple actions," says Patrick Haggard, a neuroscientist at University College London. Then again, even longer-term decisions and actions are the result of specific brain processes. "I assume this is also deterministic," says Haggard.

For Nicholas Humphrey, an emeritus psychologist at the London School of Economics, acknowledging that decisions have an involuntary, material cause in brain processes does not amount to denying free will. "On the contrary, I'm saying that I myself am the cause of it," he says. Humphrey calls his "I" an "embodied self": the sum of the thoughts, beliefs, desires, dispositions and so on that live within him. The embodied self might not be conscious of every action, but it ultimately determines them – a sort of free will on autopilot.



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A physicist might question that separation of personhood from other material parts of the universe. Biological material is nothing more than agglomerations of atoms and molecules that follow the laws of physics – and surely we can't claim to be in control of those. Vlatko Vedral, a physicist at the University of Oxford, thinks that to understand free will (or our lack of it) we need to better understand what makes the universe tick. "My guess is that we will be able to illuminate it more and more as we continue to reduce more complex natural sciences, such as biology and neuroscience, to physics," he says.

If it is all down to physics, that doesn't mean everything is predetermined. Quantum physics, our most fundamental theory of how the building blocks of the universe behave, seems to say that a degree of randomness and uncertainty is built in to particle properties and movements – including those that make us up. Scale that up, and what happens in the universe can't be entirely determined from beginning to end because

you can never know what's going to happen at the quantum scale.

Quantum decisions

Unless, that is, you believe the many-worlds interpretation of quantum theory, which says that all this uncertainty is only because everything that can happen does happen, only in different universes. In this scenario, the universe really is predetermined. The only uncertainty lies in which pre-packaged universe you find your conscious self in: the one where you ordered fish and chips or the one where you didn't.

Or you can take it even further as some physicists do, notably Nobel Laureate Gerard 't Hooft of the University of Utrecht in the Netherlands. He argues that the universe is superdeterministic – that something outside it sets everything in stone, including the outcome of experiments we might do to test whether we have free will. To some people this amounts to a god. Vedral admits the possibility can't be discounted. "Because we are finite, and part of the universe, we would still perceive it as non-deterministic." There are some battles you just can't win.

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