How Free Will Probes Mind and Consciousness: David Eagleman

Transcript - Long

Robert Lawrence Kuhn:

David, free will is one of those subjects that can be a probe of what mind is or even the nature of consciousness. It's been very extant in the philosophical literature. Physicists talk about it in terms of determinism and the laws of physics. But neuroscience is where it happens. Neuroscience is, is – explains how we decide things and what it is. So as a neuroscientist, how do you look at free will? How shall we analyze it?

David Eagleman:

There are a few camps about free will, so not surprisingly there are supporters and detractors of the existence of free will. Here's why a lot of neurobiologists think there is not free will. It's because when you look in the brain, everything is connected to everything else. All the neurons are being driven by other neurons and they're driving other neurons and so what you have is this vastly complex network but in the end, it's a network, it's mechanical. And what you need for a sort of metaphysical free will is an uncaused causer. You need something else in the system that's changing the dynamic properties of this physical stuff even though it's not connected to it directly.

Robert Lawrence Kuhn:

Because every physical law is caused by a previous physical law. Something happens and there's a chain of events no matter how complicated it is. Everything has a prior physical cause and has a, a forced result which is deterministic.

David Eagleman:

Exactly, that's exactly right. So a lot of neurobiologists will look at the brain and say, there just doesn't seem to be anywhere else to put something in there to for the uncaused causer to happen. Okay so that's why free will might not exist. And of course there are lots of experiments that can show that people will take credit for having come up with ideas even though they didn't. They were manipulated into choosing something and they'll come up with a narrative about why they did it. Those last examples suggest that we can at least be fooled into thinking we chose something freely even though we didn't.

Robert Lawrence Kuhn:

And that's used to support the deterministic philosophy based on the hard physical cause so now you have some examples that defend that.

David Eagleman:

Exactly right. And then of course we have a whole class of examples where people will do things even though they don't want to. So for example if you have Tourette's syndrome, you have involuntary tics, you'll cuss at somebody even though it's the last thing you want to do. So Tourette, people with Tourette's syndrome don't have free won't. They're not able to not do that thing. So you can't look at somebody and say oh well, you know, of course all your choices are – you get to choose them freely. We at least have lots of evidence that stuff happens that's out of our control. So all that is there. Now, why do some people believe we might have free will? Well it's because we certainly feel like we have free will, right? You, you make choices, you make decisions and we would like to think we're not just deterministic beings that are being cranked forward with an algorithm.

Robert Lawrence Kuhn:

I think I can raise my hand or not, or whatever I want.

David Eagleman:

Precisely. So we have that impression. The situation currently is that there is no killer experiment that actually distinguishes these. We don't have something where everyone says oh yeah that's a good experiment. Now we know which answer is correct. I'll tell you my own view on it, which is that when you above a system of sufficient complexity, there is a, there is a very really sense in which that complex system in making choices and deciding. And even if it is deterministic in some way, it's so complex and it incorporates its past experience and makes probabilistic decision making and so on that it essentially indistinguishable from a system that has what we would like to think of as free will.

So as an example, if you imagine the brain like a giant corporation with 100,000 employees. The CEO does not get to just make any sort of wacky decision to go off in a new direction. He or she is bound by the capabilities of the company, the sentiment of the company, what the employees want to do, and likewise the employees can't go off and do stuff on their own. They have nested loops of management and middle management and all the way up to the CEO. It's a giant organism. And that organism reacts to its environment which might be the stock market or the customers in the case of a corporation. This giant organism works its way through the world, reacting to stimuli and making choices. It makes choices. This is that advertising campaign did not work so let's try this other thing. But nobody's really in charge. It involves the whole system.

Robert Lawrence Kuhn:

Well let, let's follow the analogy – and it's only an analogy I understand that. But a CEO can override the opinions of the corporation. Steve Jobs is an example at Apple, classically. He has dominated and it's his sense of aesthetics which has driven products and fired people, whatever it took to do that. I mean over-rid it. Now, if you apply the analogy, that would mean that the CEO, whatever that is in me, in my brain, in my mind, can do that but when we looked at it from a neuroscience point of view, the first category, there's no CEO.

David Eagleman:

Well there is a CEO in the brain in the sense that that is the highest level of abstraction. So at the lowest level you've got all the neurons and the mechanisms that make things happen. You have layers of abstraction on top of that and on top of that so and just like a company with a CEO so that when you think about it –

Robert Lawrence Kuhn:

But it's all neurons, it's all connections. It's all the same thing. One, one thing triggering another thing in a perfect concatenation with nothing else coming in.

David Eagleman:

That's exactly right but the different levels of the system, even though they are built of neurons, you have different levels of representation on that. In exactly the same way that the company is built of people the whole way up, it's all just people. But you have some people who are sort of looking at things in a real long-term strategy and they're seeing the whole company. You have exactly the same thing going on in the brain. It's mostly your prefrontal cortex which cares about yourself through time, which cares about these other areas in a, it ignores the details and just cares about what is getting accomplished in the outside world.

Robert Lawrence Kuhn:

OK so just to continue the highest level abstraction in the cerebral cortex prefrontal or wherever it is, is in some case overruling whatever is coming up from the lower levels, that can happen I think. But, but the issue comes up in the, in the CEO, when you have him in a corporation just looking at it as a kind of a dot CEO without, without structure. That dot CEO can make a free-will decision to override the corporation but when we're talking about the CEO in the brain, this enormously complicated prefrontal area, that's neurons itself. That's the same thing going on there. There's no difference. It, it's all pathways and one neuron connecting to another and it's just another network and it's running by its own deterministic system. So your CEO is just as deterministic as, as the whole system.

David Eagleman:

I agree with you. I think this may be where the analogy breaks down is that the – so Steve Jobs actually has, we at least we think Steve Jobs might make decisions about things in a free will kind of manner, but in the brain of course it's exactly right that everything is driven by everything else. But it is the case that your prefrontal cortex is

responding to outside stimuli, it cares about you in time. About your future and your past and so it can win in certain circumstances over other areas like the limbic system.

Robert Lawrence Kuhn:

Fair.

David Eagleman:

Where your limbic system says, I want to do this right now. I want to eat that cookie and your prefrontal cortex says don't eat it, you're going to get fat, it's unhealthy. You can have an arm wrestle between these parts of the brain, and it's not that anybody is making a free choice. It's like all of your history, your experience leads up to you being a certain kind of person who can resist a cookie.

Robert Lawrence Kuhn:

I totally agree with that, but what I think you are arguing, your argument leads to is a sophisticated kind of determinism. I don't see any difference.

David Eagleman:

Oh agree, no, no I agree, but that's why I think it's analogous to a, the reason it's helpful to think about accompany is because companies are very complicated and they have nested feedback in all levels of the system. But it is still the case that you would look at a company. You look at Nike shoes and you say, yeah Nike shoes makes decisions and navigates its way through the world. It responds to the market. It's essentially like free will, what we would want to be free will, in the sense that it's reactive, it makes choices. It uses probabilistic decision making. And maybe that's the best we can get. But that's good enough.

Robert Lawrence Kuhn:

But it is not classically what's called libertarian free will. It is, it is, it is a sophisticated kind of determinism. That's the way it sounds to me.

David Eagleman:

I mostly agree with you on that. The problem with the libertarian free will is, as I said, it might be that our science is just too young to understand how it could work. But I don't even know that there's a good definition of what it would mean to, to say that we make free choices completely independent of, of anything else or that we have the capacity to do that.

Robert Lawrence Kuhn:

Well, it would mean some sort of factor that is not caused by the, the neuronal activity that came from the past. Now, if there was something in the neuronal activity at the present that created that, who knows. But there is still a gap in our understanding. I think we both agree with that.

David Eagleman:

Yeah, there is a big gap in the understanding. I just want to know if you would look at Nike the way it navigates itself through the world as a giant organism and say, say that there's anything lacking in its behavior that would make you feel like that it's not making free decisions and it's not responding to its environment in a way that resembles choice and probabilistic decision making.

Robert Lawrence Kuhn:

I, I would say that a corporation's decision making is, is closer to a, a real free will than I think we can establish in a human being right now in the human brain.

David Eagleman:

Really. Why? But, but Nike of course is just responding to its to its environment and it has very complicated decision making all up and down the ladder, but in the end that's exactly what's happening in the brain. You have

lots of experience that's given you probabilities on different aspects of how you should behave. You have different parts competing in the brain about what it thinks the right thing to do is, you have very long-term parts. And, and there is this competition at all of the levels and you navigate through the world just like a corporation does.

Robert Lawrence Kuhn:

Yeah I guess, I guess that the trick would be is that in, in Nike to really get down to it, each of those individual decision points are a human being and I think we're in, in circles and circles.

David Eagleman:

But assume the humans don't have free will in Nike, the employees of Nike are just like us in that lets say they don't have free will.

Robert Lawrence Kuhn:

Well then there, then there maybe not free will but it may be masked more easily masked in that case, because it will be the, the key points will be smaller and it becomes like a chaotic system that, that has a – that has more of an illusion of free will than it would really have.

David Eagleman:

And I think that's exactly what's going on with us. So Nike has 100,000 employees, we've got a hundred billion employees.

Robert Lawrence Kuhn:

Billion.

David Eagleman:

Exactly. And so what happens is –

Robert Lawrence Kuhn:

And ours talk to 10,000 at any one time, not just one or two.

David Eagleman:

Exactly right. So what happens is the system is so sufficiently complex and it does probabilistic choice, and that essentially is indistinguishable from libertarian free will.