

Transcript - Long

Robert Lawrence Kuhn:

Bob, free will has been the domain of philosophers. I think we should broaden the attack on free will. As a neuropsychologist, particularly one who has studied the array of neuropsychiatric disorder, what can you tell us about free will?

Robert Bilder:

Well, it's fascinating, free will is, I think, one of the cornerstones of all brain activity and you know, as we've evolved, our brain, you could roughly divide between the part of our brain that's dedicated to action and the part of our brain that is dedicated to processing of inputs. And over evolution, these things have become quite elaborated, but I often give the example of a dinoflagellate, you know, the one-celled organism with the little tail, so how this little guy gets light onto the top of him, and then his tail goes faster, and that drives him towards the light. I would argue that, that even though that's a completely automatized, predictable process, that he's showing a drive to get to the light, and to get to where the food is, and I think that, you know, we have such an elaboration of this process over, you know, hundreds of millions of cells later, and a billion years, that the same fundamental processes though that are associated with our drive to survive, to reproduce, and to execute actions that will be in the service of those goals. That this is free will.

Robert Lawrence Kuhn:

Okay. What about problems with free will? Trauma that occurs to the brain or the, the neurochemistry that alters free will in different ways. What are some of the neuropsychiatric disorders that impinge on our understanding of free will?

Robert Bilder:

It's, it's really amazing that we can see in the presence of neuropathology breakdowns in free will at every level, hierarchically from the most minute motor program, all the way up to the entire process of envisioning a long-term goal. And it looks as though action starts at the level of the representation of a long-term goal or drive state, and then the rest of the brain that's associated with will and action begins to aggregate around that nucleus of a goal, and as other bits of brain activation begin to resonate with that initial goal, then other pieces come into play. So, from a goal might come a plan, from a plan might come a sequential strategy of how we're going to go about that plan. From the sequential strategy, then comes the actual sequence of actions that are necessary to achieve that goal, ultimately down to the motor implementation. And what we've seen in cases of neuropathology with focal brain lesions is breakdowns in that process, everywhere from the most broad plan, down to the most specific action.

Robert Lawrence Kuhn:

Let's take some specific cases in that gradient, from the most specific to the, the broad general.

Robert Bilder:

Yeah. So, in studies of patients with frontal lobe lesions, we can have them do little drawings, and so we could see a phenomenon that's referred to as perseveration. That's an inability to terminate a motor program, and, or any kind of an action program. But we can see people have breakdowns at the level where they'll just, if you ask them to draw a circle, they'll just keep on drawing a circle, drawing, and drawing, and drawing until they wear through the paper, because they just can't seem to stop that fundamental, low-level motor action. However--

Robert Lawrence Kuhn:

And when you ask them about it, what do they say?

Robert Bilder:

They say you asked me to draw a circle. Yeah. I mean, a patient may think that they were compliant with that, that instruction. However, you could have somebody drawing a circle, and then ask them to draw a square, and they might be able to do that fine, but then imagine you had an intervening activity where they were asked to solve some mathematical problems. Then you go back and ask them to draw a circle again, and they draw a bracket that you would use in algebraic notation. Ask them to draw a square, they draw a square bracket that might be used in algebraic notation. Now there, what's been perseverated is not the low-level motor action, but rather a higher level of representation that has to do with the entire activity, and the same kind of thematic perseveration can occur at even, even higher levels. So, you could read someone a story, and then read them another story, they might contaminate entire moral elements from one story to the next. And so, these kinds of breakdowns can occur at any level from the most, you know, minute motor implementation to the highest level of goal and drive.

Robert Lawrence Kuhn:

And they'll be that specific?

Robert Bilder:

Oh yeah.

Robert Lawrence Kuhn:

The, the, the pathology would be limited just to that one very narrow area, or more.

Robert Bilder:

That's right, [crosstalk] you can see these dissociations, so the person with the high-level perseveration will not have any difficulty with the low-level stuff and the person with the low-level perseveration won't have any problem with the high-level stuff.

Robert Lawrence Kuhn:

What does that tell us about the nature of free will, the sense that whatever I'm doing, I'm doing it because I want to do it?

Robert Bilder:

I think that that sense of agency is also a brain function. We know that that can be, you know, robbed in the case of certain brain lesions. And then I think the, the rest of it has to do this nature, hierarchically organized execution of action that, you know, we do have representations of goals, and then below that, a level of strategy implementation, and below that, a level of motor implementation, and that these things are stacked up but connected, and the amazing thing is that we can see the dissociations among these processes.

Robert Lawrence Kuhn:

What type of therapies do you use to try to improve these pathologies of free will?

Robert Bilder:

Yeah, so that's an area where, you know, very little real progress has been made, because the syndromes, neurologically that, that alter these kind of states, are relatively rare, so, the, the things that are, that tend to be done in therapies really focus on either trying to get around the problem using some alternate paths, or provide a prosthesis in the external world that can help people not have difficulties with the, the problems that they are having.

Robert Lawrence Kuhn:

When you've, when you see problems in free will on these very specific aspects, do they have implications for the whole sense of free will that the individual has, or is that just a minor aberration?

Robert Bilder:

Well, an amazing thing is that the patients who have these problems will frequently not have much insight into the nature of that problem, so--

Robert Lawrence Kuhn:

What does that tell you?

Robert Bilder:

Yeah, from my point of view, and again, I'm not a philosopher, so a philosopher might have a cleverer point of view, but I believe that what we're witnessing there is a breakdown in the substrates of the neural basis of free will that are actually robbing us of elements of free will, in terms of our subjective experience of free will. Now the degree to which you're actually manifesting free will depends on the nature of the problem. I mean, I would see free will as being the ability to execute an action plan that is in line with the goal state that you had at the beginning. And so, unfortunately, many syndromes will disrupt something about that process. They'll decrease the efficacy that we may have and the ability to harness action programs that relate to our, our fundamental goals and drives.

Robert Lawrence Kuhn:

And overall though, what can the, the pathologies of neuropsychology tell us about the nature of free will?

Robert Bilder:

I think that they may help us philosophically to understand the connection between drive states, goal states, and action plans, and then what is our subjective experience of each one of those processes? So, I think that there is potential for being able to tease apart some of these subcomponents of free will, so that we can analyze them better and understand their unique contributions to the entire high level concept of free will.