

FREE WILL, AGENCY, AND EVOLUTION

Most of us think we have free will, and we certainly act as if we do. We expect ourselves to do certain things and not do other things, and we feel responsible for those choices. We have the feeling, the sense, that we control those behaviors, or at least that we have the ability to control decisions about which things we do and which we don't. We attribute to other people their own agency, which we take to be just like ours, even if they may have different ideas about proper behavior.

There's a school of thought that says we don't control those things. Here's a recent article about Robert Sapolsky, a Stanford University neurobiologist, who doesn't agree. He's not the only one. Perhaps recognizing that this is an intractable problem, many scientists use the term agency instead of free will.

One is Michael Tomasello, whose book, *The Evolution of Agency*, I'll be examining in the next few posts. Agency carries less moral baggage, and it's something that can be described and studied neutrally; at least more neutrally. Tomasello doesn't give a precise definition of agency. This is from the introduction:

...[I]n the current case, we may say that agentive beings are distinguished from non-agentive beings ... by a special type of behavioral organization. That behavioral organization is feedback control organization in which the individual directs its behavior toward goals—many or most of which are biologically evolved—controlling or even self-regulating the process through informed decision-making and behavioral self-monitoring. Species biology is supplemented by individual psychology. P. 2.

The book rests on two assumptions. The first is that the basis of agency is a feedback control activity, a psychological mechanism, seated in the brain. The second is that agency is an outcome of evolution.

Feedback control organization

Tomasello's feedback control organization works like a thermostat. The idea is that a goal is set for the thermostat: keeping the temperature at a certain level. It has a sensor that measures the ambient temperature and compares it to the goal. It then turns on another device that brings the temperature closer to the goal. It continues to test the ambient temperature and when it reaches the goal, it turns off the device.

Tomasello claims that this is the only model that can work to enable things to control themselves. He points out that all efforts to get machines to operate autonomously work in accordance with this model.

Evolution and agency

Tomasello doesn't think there's a goal for evolution. He thinks that as brains become more complex, the feedback control activity takes on a different shape, a shape that takes advantage of the bigger brain. I'll just toss in the observation that mutations happen all the time, and some become established in subpopulations whether or not they have any survival value. That might include hair color or a larger brain. If circumstances change, the mutation may suddenly have survival value, and the subpopulation thrives while the rest of the population suffers.

Studying psychological processes

Tomasello says agency is a psychological process, one that occurs in the brain of an individual creature. It cannot be studied directly. Instead scientists infer the existence of psychological processes from the overt behavior of subjects.

Scientists infer psychological agency when the organism acts flexibly toward its goal even in novel contexts. To behave in this flexible manner, the individual must go beyond a stimulus-driven, one-to-one mapping between perception and action. The individual must be capable of choosing to act or not to act, or among multiple possible actions, according to its continuous perceptual assessment of the situation as it unfolds over time (sometimes employing executive processes such as inhibition, as a further control process, during action execution). P. 27.

The layout of the book

Evolution has been at work on this planet for hundreds of millions of years. We say that different species split off from lines of evolution, as humans split off from the great apes; and as homo sapiens eventually split off from the first hominids, and then evolved into modern humans. The lines go back to the beginnings of life on the planet, to the earliest living creatures.

Tomasello thinks certain existing species have no agency, and the rest fall into four categories. He selects five of them to represent his five categories of agency.

1. No agency: *C. elegans*, a tiny worm-like creature (the image on the home page is a bunch of these creatures)
2. Goal-directed agency: lizards as representative of reptiles
3. Intentional agency: squirrels as representative of small mammals
4. Rational agency: great apes as representative of great apes
5. Socially normative agency, which has two subcategories
 - a) young human children as representative of hominids with a simple form of socially

normative agency

B) adults humans who exhibit a more comprehensive socially normative agency

Tomasello treats each category of agency in its own chapter. The last chapter is mostly for his fellow scientists, discussing gaps in the research and proposals for future work on this model. In each chapter Tomasello explains how the agency works, the evolutionary pressures that might have led to it, and the nature of the world as perceived by the example creatures. These issues are supported by a empirical evidence from academic and field studies.

I'll take a quick look at the first three levels of agency, and discuss socially normative agency in more detail.

Creatures without agency

Let's start with *C. elegans*. This is a worm-like creature about 1 mm in length. We know a great deal about it: we have sequenced its genome; and identified its 302 neurons, their connections, and the role each plays. It has no sensory apparatus beyond the ability to sense nutritious and certain noxious substances. It lives in organic material, where it eats bacteria. It has rudimentary powers of movement. They are mostly hermaphrodites. For more, see this dense Wikipedia entry.

Basically it moves around in organic muck eating bacteria. If it isn't finding any, it moves. If it detects a noxious substance it moves. That's about it. Tomasello says that with the tiny number of neurons, it's hard to imagine the creature could have a goal, let alone behave flexibly to achieve it. It is purely stimulus driven. It's sensory apparatus is very simple, so it only recognizes a few stimuli, and it responds to them mechanically.

In Tomasello's terms, this creature is non-agentive. He calls it an animate actor. There's not much else to say about it.

Discussion

I'm not fond of the word "agentive", which strikes me as an ugly neologism, but it points to something about human behavior. Not all of our behavior is agentive. Take breathing. We can control it, but mostly we don't. It's an interesting exercise to think about what parts of our actions are agentive.

Another way to put that is to ask how much we resemble *C. elegans*.