Rodents, robots and humans

The sleazy science of commandeering animals' brains

By William Saletan

May 10 — Last week, scientists reported in the journal Nature that “a guided rat can be developed into an effective ‘robot.’ ” The scientists steered rats around an obstacle course by sending radio signals from a laptop computer to electrodes wired into the rats’ brains. The signals gave each rat the sensation of brushing an object with its left or right whiskers. When the rat responded by turning left or right, as commanded, the scientists sent a third signal that made the rat feel good. The revelation in the experiment, however, is how the scientists made themselves feel good. The story isn’t what we tell the rats. It’s what we tell ourselves.
WE TELL OURSELVES we’re commandeering animals for good purposes. The report’s senior author, neurophysiologist John Chapin, told ABC News, the New York Times, and other media outlets that the experiment’s techniques could be used to train “rescue rats” to search for people trapped in rubble at disaster scenes. Chapin’s colleague Sanjiv Talwar added:

“The larger idea behind the study was to continue our research in neurorobotics. We wanted to get an idea about how effectively can animals sense brain-stimulation cues. This would enable us to evaluate the feasibility of a ‘sensory’ prosthesis, which could enable paralyzed patients to experience sensations such as touch and so be able to better control an artificial limb through a suitable brain-machine interface.”

FOR A GOOD PURPOSE?

The media put these spins together mathematically: One good purpose plus one good purpose equals two good purposes. “Remote Control of ‘Living Robots’ Offers Promise of New Treatments for Paralysis, Rescue Missions,” said the Wall Street Journal. “Technique’s Potential Uses Include Aid to Victims of Disaster or Neural Injuries,” agreed the Washington Post. But journalists, if not scientists, should remember that life isn’t mathematical. It’s narrative. The rescue rationale didn’t just add to the prosthesis rationale. It succeeded it. And when rationales change, journalists’ whiskers should go up.

Chapin’s Web page shows that he’s been working for years.
It would be acceptable but should be limited to lower-order animals. There is no reason to limit such research on ethical grounds.

RATIONALIZING RESEARCH

We tell ourselves we’re only investigating how animals respond to stimuli. Scientists are just “bringing information back into the brain,” Chapin told the Los Angeles Times. Information? What Chapin’s team gave the rats was, in the words of the team’s paper, “a virtual ‘touch’ to the left or right whiskers by stimulating their respective cortical representations.” The “chief benefit” of this technique, according to the paper, is “its ability to dissociate explicit schedule variables such as cues and rewards from the physical variables that are normally associated with their delivery.” In other words, you don’t have to put a wall in front of the rat or give it an edible treat. You just make it think that it has touched a wall or been given a treat. That isn’t information. It’s deception.

A rat maneuvers along a railroad track using a remote-controlled micro stimulator. By implanting electrodes in rats’ brains, scientists have created remote-controlled rodents they could command to turn, climb, jump or navigate piles of rubble.
We tell ourselves that the rats are happy and unhurt. “The rat looks normal and isn’t feeling any pain because he’s getting rewards for doing the right thing,” Chapin told the Post. In the Los Angeles Times, Talwar mused, “The rats could almost understand what you wanted them to do.” Rewards? Understand? There were no rewards, and the rats understood nothing. An animal controlled by a whip or bridle knows, at least, that it’s being dominated. An animal controlled by fabricated sensations and gratifications doesn’t.

What’s creepy about the robotized rats isn’t that they’re unhappy. It’s that they’re happy doing things no autonomous rat would do. Chapin’s paper boasts that his team steered the rats “through environments that they would normally avoid, such as brightly lit, open areas.” A companion diagram notes that a rat “was instructed to climb a vertical ladder, cross a narrow ledge, descend a flight of steps, pass through a hoop and descend a steep (70 degree) ramp. Two rounds of high-density MFB [medial forebrain bundle] stimulation were required to guide the rat successfully down the ramp, demonstrating the motivational qualities of MFB stimulation.” The rat wasn’t whipped or pushed. It was “motivated.”

ORWELLIAN FEARS

We tell ourselves we won’t do this to dogs, monkeys, or humans. “We’re trying to avoid using bigger animals,” Chapin told the Post. But that language is already hedged. History shows little human reluctance to manipulate higher animals. We’ve used attack dogs, lab monkeys, and military dolphins trained to hunt human divers. Our rationales for robotizing rats are already moving in that direction. “Rats are more mobile than mechanical robots,” Chapin explained. “The rat has rather sophisticated navigational skills developed over 200 million years of evolution. It makes sense to make good use of the animal’s abilities.” Good point. And dogs, being more evolved, have even better navigational skills. And monkeys, being still more evolved, have still better navigational skills. Almost as good as humans.

The most famous novel about mind control, George Orwell’s 1984, ends with the protagonist losing his will at the prospect of having his head locked in a cage full of rats. How silly. Nobody’s going to lock you in a cage. Soon, even rats won’t have to be locked in cages. They’ll be happy doing whatever we want them to do. They’ll love Big Brother.

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