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Revealed: How We Know Fido From Felix

By REUTERS

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WASHINGTON (Reuters) - It might not seem like being able to tell a cat from a dog is an important skill, but researchers said on Thursday they had found monkeys have brain cells specifically assigned to the task and people may, too.

The team at the Massachusetts Institute of Technology found that individual neurons in the monkeys' brains became tuned to the concept of ``cat'' and others to the concept of ``dog.''

Writing in the journal Science, they said their study shows how the brain categorizes things.

``One of our most fundamental behaviors is to assign meaning to what's around us,'' Earl Miller, an associate professor of brain and cognitive sciences who helped lead the study, said in a statement.

``When we enter a room, we don't spend a lot of time and effort identifying the objects. We know immediately if something is a chair or a table, and how to use it, even if we have never seen that particular chair or table before.''

Yet, he said, scientists know almost nothing about how the brain does this.

Miller, a neural scientist, said he believed individual neurons would have to be involved.

``Imagine a young child learning about a cat,'' he said in a telephone interview. ``You have a very long laundry list about what makes a cat. If it has long whiskers, purrs and has fur, it must be a cat. This information gets encoded in single neurons in the brain.''

The brain has to be able to get this information and put it together quickly.

``By encoding the information on a single cell level, the brain can automatically and effortlessly categorize everything,'' Miller said.

He and colleagues showed their rhesus monkeys computer-generated images of ``generic'' cats and dogs -- a house cat, a tiger and a cheetah, and a German shepherd, a pointer and a St. Bernard.

BLENDED IMAGES GIVE GENERIC ``CAT'' AND ``DOG''

They blended the six images into a single image. As soon as the image was more than half cat or dog, the monkeys, which had never seen a live example of either type of animal, correctly categorized it 90 percent of the time.

``It was a long, slow learning process, but they learned what makes a cat a cat and what makes a dog a dog,'' Miller said.

``The monkey's individual neurons became sensitive to features that comprise a dog or cat. With enough experience, that happens automatically.''

To follow what the neurons were doing, they stuck extremely thin wires into the monkey's brains. Such wires are often used to monitor individual neurons in the brains of laboratory animals.

``It's a painless procedure,'' Miller said. ``We recorded the prefrontal cortex, which is important to high-level cognitive function. We thought it was a likely spot.''

Because monkey's brains are so similar to the brains of humans, Miller said he was certain the same thing happens in people -- although he said he cannot go around sticking wires into the brains of human volunteers.

Next he wants to find other regions of the brain that are involved in this process of categorizing. ``It is certainly not the prefrontal cortex alone,'' he said.