

Tracking feline memories on the move

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When a cat steps over an obstacle with its front legs, how do its hind legs know what to do? A new study in the August 21st issue of *Current Biology*, a publication of Cell Press, reveals that it is the foreleg stepping movement itself that leaves a lasting impression. By comparison, feline memories of having just seen an obstacle proved rather fleeting.

Indeed, the researchers found that cats could remember having stepped over a hurdle for at least ten minutes. The findings suggest that cats' working memories can extend much longer than earlier studies had shown, according to the researchers.

"We've found that the long-lasting memory for guiding the hind legs over an obstacle requires stepping of the forelegs over the obstacle," said Keir Pearson of the University of Alberta, Canada. "The main surprise was how short lasting the visual memory on its own was—just a few seconds when animals were stopped before their forelegs stepped over the obstacle."

The researchers examined the animals' memories by stopping cats after their forelegs, but not their hind legs, had cleared an obstacle. They then distracted the animals with food and lowered the obstacle into the walking surface. The nature of the subsequent step revealed whether the animal remembered having stepped over the "disappearing" obstacle. To find out whether the cats remembered what they saw versus what they did, Pearson's group repeated the experiment, but this time they stopped the cats just before they made their first step.

The results revealed that when the animals stepped over the obstacle with the forelegs they remembered this action for a long time and stepped up with their hind legs to clear the necessary height. However, if the forelegs did not step over the obstacle, the memory of the obstacle was quickly lost; simply seeing that an obstacle lay in their path wasn't enough.

“Animals, including humans, unconsciously keep track of the location of objects relative to the body as they move, and this tracking is largely dependent on signals associated with movement of the body,” Pearson said.

Although it is not entirely clear how the four-legged stepping of cats relates to people, Pearson said such memories might play a role in humans’ ability to navigate objects in the dark—for example, when you move through a cluttered room in the light, turn out the light, and continue avoiding objects you can no longer see.

Rock climbers might experience a similar phenomenon, Pearson added. “We have not tested this yet, but it is possible that the trajectory of the hands relative to potential impediments establishes a memory for guiding the trajectory of the feet in the absence of vision,” he said.

Source: Cell Press

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