

Your Dog Remembers More Than You Think

Once again, science has confirmed the suspicions of dog-owners that their beloved pets know more than they are letting on. In this case, it has to do with memory, a favorite subject of researchers who study the mental abilities of other animals.

No one doubts that dogs can be trained to remember commands and names of objects. They also remember people and places. But Claudia Fugazza and her colleagues at the Family Dog Project at Eotvos Lorand University in Budapest set out to see whether dogs share a more complex kind of memory.

In people it is called episodic memory, and it involves a sense of self. In animals, it's called episodic-like memory, because it's difficult to try to plumb something as elusive as self without the aid of language.

All attempts to understand thinking and memory in nonverbal animals are difficult, and Dr. Fugazza, Adam Miklosi and Akos Pogany developed a technique that depends on something called "Do-as-I-do training," which itself is pretty amazing.

In this training, dogs learn to imitate any action the trainer takes. First the trainer does something like touch an open umbrella with his hand. Then he says, "Do it." Then the dog taps the umbrella with its paw — assuming the training is going well.

Dr. Fugazza and her colleagues studied dogs that had learned the do-as-I-do command. They then switched to a different kind of training, teaching the dogs to lie down on a mat as a response to a new action by the trainer rather than wait for a "do it" command.

Finally, they added one more step. After a trainer did something a dog had not seen before, like tapping an umbrella that lay nearby the mat with his hand, he took the dog behind a screen for a minute.

Then he came back to the mat and, presumably to the dog's surprise, said, "Do it." The dogs in the experiment reliably imitated the umbrella tap or whatever the trainer had done before.

Dr. Fugazza and colleagues reported online in *Current Biology* that this showed that the dogs remembered an event they hadn't been concentrating on, the

trainer's action. She said one aspect strengthened that conclusion: The dogs tended to lie down immediately when they got back to the mat, suggesting that their heads were in "lie down" mode, not "do it" mode.

Also, the dogs were not as good at the imitation command when it was unexpected, which is what would happen with incidental episodic-like memory rather than remembering an action for an expected command.

Other experiments have suggested that chimpanzees, rats and pigeons have episodic-like memory. But Dr. Fugazza said the latest work with dogs is "the strongest evidence" yet, because the events they remember are richer "in content and context" than in previous experiments.

Jonathon D. Crystal of Indiana University, who studies episodic-like memory in rats and wrote a commentary on the work that will appear in the print edition of *Current Biology*, said he thought the conclusions were strong, although it was very difficult to ensure that a memory was truly incidental in a training situation. He said human episodic memory is lost in Alzheimer's disease and he and others study animal memory in hopes of learning how to combat that loss. The work on dogs offers a new technique that could be very useful, he said.

What does this mean for the dog owner? Dogs probably remember what their owners do even when training isn't going on. And, she said, "It tells us that the dog's memory is more similar to ours than we expected."

Source: The New York Times

Choose THREE correct answers from the list of possible answers below for this question, based on information given in the text:

Which of the following statements are true?

- A. Training can help dogs remember people and places.
- B. The support of language is essential in animals training related to their memory.

- C. All the dogs involved in “Do-as-I-do training” have done exactly what their trainers say.
- D. Dr. Fugazza claims that the dogs remember the trainer’s consistent command more than what they did not pay attention to.
- E. Being able to predict commands from trainers will increase performance of dogs in imitation command training.
- F. Only dos have been scientifically proven to possess episodic-like memory.
- G. Jonathon D. Crystal has no doubts over the experiment done by Dr. Fugazza as he believes that training circumstances would lead to unbiased results.
- H. How memory of dogs works can be applied to solve the problem of Alzheimer.

KEYS:

A (*No one doubts that dogs can be trained to remember commands and names of objects. They also remember people and places*)

B (*... because it's difficult to try to plumb something as elusive as self without the aid of language*)

E (*Also, the dogs were not as good at the imitation command when it was unexpected ...*)