

Dogs imitate novel human actions and store them in memory

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This image shows a dog owner demonstrating an action. Credit: Animal Cognition/Claudia Fugazza

Dogs can learn, retain and replay actions taught by humans after a short delay. According to a new study by Claudia Fugazza and Adám Miklósi, from Eötvös Loránd University in Hungary, this deferred imitation provides the first evidence of dogs' cognitive ability to both encode and



recall actions. The research is published in Springer's journal Animal Cognition.

Domestic <u>dogs</u> are particularly keen on relying on <u>human</u> <u>communication</u> cues. They learn by observing humans and are easily influenced by humans in learning situations. Living in human <u>social</u> <u>groups</u> may have favored their ability to learn from humans.

Fugazza and Miklósi looked at whether dogs possess the cognitive ability of deferred imitation. Eight adult <u>pet dogs</u> were trained by their owners with the 'Do as I do' method and then made to wait for short intervals (5-30 seconds) before they were allowed to copy the observed human action, for example walk around a bucket or ring a bell. The researchers observed whether the dogs were able to imitate human actions after delays ranging from 40 seconds to 10 minutes, during which time the dogs were distracted by being encouraged to take part in other activities. The researchers were looking for evidence of the dogs' ability to encode and recall the demonstrated action after an interval.

Fugazza described how one of the tests was carried out: "The owner, Valentina, made her dog, Adila, stay and pay attention to her, always in the same starting position. Three randomly chosen objects were set down, each at the same distance from Adila. When Adila was in position, Valentina demonstrated an object-related action, like ringing a bell with her hand.

"Then Valentina and Adila took a break and went behind a screen that was used to hide the objects, so that Adila could not keep her mind on the demonstration by looking at the object. During the break, Valentina and Adila either played with a ball or practiced a different training activity, for example, Valentina asked Adila to lie down. Or they both relaxed on the lawn and Adila was free to do whatever she wanted - sniff around, bark at people passing by, and so on.



"When the break was over, Valentina walked with her dog back to the original starting position and gave the command 'Do it!'. In a control condition, the 'Do it!' command was given by someone other than the owner, who did not know what action had previously been demonstrated by the owner. After the 'Do it!' command, Adila typically performed the action that was previously demonstrated."

The tests show that dogs are able to reproduce familiar actions and novel actions after different delays ? familiar actions after intervals as long as ten minutes; novel tasks after a delay of one minute. This ability was seen in different conditions, even if they were distracted by different activities during the interval.

The authors conclude: "The ability to encode and recall an action after a delay implies that the dogs have a mental representation of the human demonstration. In addition, the ability to imitate a novel action after a delay without previous practice suggests the presence of a specific type of long-term memory in dogs. This would be so-called 'declarative memory,' which refers to memories which can be consciously recalled, such as facts or knowledge."

More information: Fugazza C & Miklósi A (2013). Deferred imitation and declarative memory in domestic dogs. Animal Cognition; DOI 10.1007/s10071-013-0656-5

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