Discovering the Einsteins of the Dog World

by C.Flisi

Owners of border collies know automatically that their dogs are

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very VERY smart — the smartest of any canine breed. Dog IQ was formalized by a psychologist named Stanley Coren in a book published in 1994. He ranked 130 breeds of dog on two criteria: how fast they learned a new command, and how quickly they obeyed commands. Border collies bested the second-ranking breed, poodles, by a wide margin.

Border collies were developed in Scotland to help shepherds handle herds of unruly sheep in challenging, often remote terrain; the dogs had to use independent judgment when out of signaling range of their owners so performance was favored over looks. And still is today: anyone who has been around border collies can testify to their innate herding ability, which comes from a combination of instinctive, adaptive, and working intelligence.

But scientists need empirical, not anecdotal, evidence to prove that an

animal is reasoning by intelligence rather than instinct alone. That is where Rico comes in. Rico was a border collie living near Cologne, Germany, in the 1990s. His owners thought he was pretty clever at retrieving objects by name, and he wound up on German television showing off his knowledge of a claimed 200 words.

Three researchers from the Max Planck Institute for Evolutionary Anthropology in Leipzig ((Juliane Kaminski, Josep Call, and Julia Fischer) happened to be watching. "The program triggered a number of questions in our minds," Dr. Call remembers. "How does this dog do what he does? How does he understand the words and make the distinctions among 200 objects? Is this a trick setup for TV?"

The scientists contacted the owner and asked if they could test Rico under controlled conditions, and found — to their surprise — that NO

tricks were involved. But to turn their findings into credible science, they had to conduct a proper experiment. So they brought new toys to Rico with new names, and the dog was able to fetch them after one repetition. They found out that he knew 300 different words, not 200.

More impressive still: he demonstrated a skill known as fast mapping, i.e., identifying the name of an object by exclusion. The researchers presented him with several objects in a pile, all but one known to him. They used familiar labels to request that he bring them "ball" and "newspaper" and the like. Then they asked for a "Toma", a word he did not know. He brought them the one new object in the pile, associating by exclusion the one unknown object in the pile with the unfamiliar word.

One month later they tested him again to see if he still remembered "Toma." And he did, although he had

heard that word and seen that object only once. He wasn't perfect every time, but his success rate was far better than chance — clear proof of his fast mapping ability.

Fast mapping is one of the ways in which toddlers grow their vocabulary exponentially between the ages of two and five. Without it, the speed at which small children learn new words would not be possible, since they learn not only by association but also by inference. Humans were believed to be the only animals with this capability until Rico.

This discovery opened a new Pandora's Box of questions. Presumably humans developed fast mapping abilities because they needed to learn many words. (The average adult knows about 42,000 of them). So why did Rico develop this ability? A dog does not have the language needs of a human because a dog has not evolved to

communicate that way. There is no question that humans tap inferential processes to learn language. But it is not the evolution of language that causes those inferential processes to develop, because Rico has them too.

Researchers might conclude that inferential processes were in place and *then* they were co-opted by language to evolve and develop. One can speculate that at least some of the inferential processes used by human infants to learn language already exist in other species.

"Rico is a really interesting story," reflects Dr. Call. "He absolutely loved this game. When we first published the paper about him in 2004, the press was very excited. There was a lot of coverage and I can't tell you how many emails we received from dog owners telling us, 'My dog does the same thing.' What was really striking is that most of them were border collies."

The Max Planck researchers subsequently tested five other dogs in Austria and Germany and found that Rico was not an exceptional Einstein; border collies tend to be good at this. Some years later, a border collie in South Carolina, Chaser, earned the moniker of "smartest dog in the world" when she was tested and shown to have an understanding of more than 1,000 words. Unsurprisingly, she handled fast mapping with ease.

Rico died in 2008 and Chaser in 2019. Meanwhile an entire cottage industry has grown up around the subject of canine intelligence. Dog owners tend to extoll their brainy canines, but not every pet is a Rico, much less a Chaser. Rigorous analysis is needed so scientists can identify what process is at work when Rover responds to words.
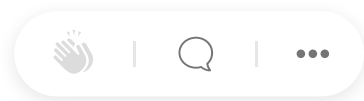
Dr. Call admits that he and his colleagues occasionally wind up in an awkward position when they

announce to an owner that his or her pet is cleverly doing so and so. "Sometimes the owner may be annoyed, saying to me with exasperation, 'Yes, I TOLD you he was doing that.'"

Perhaps scientists do not catch on quite as fast as canines.

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