

# Both Ends of the Leash

## Walking the Talk

### What do dogs understand and how do they understand it?

Patricia B. McConnell

Alex, the world's most famous African Grey parrot, died September 6, 2007, and the world is a sadder place for it.

You may be wondering why a column about dog behavior would begin with a memorial to a parrot, but there is an important connection between Alex's behavior and that of your dog. It was Alex, and his human, Irene Pepperberg, who stretched our understanding of what goes on in the minds of nonhuman animals, including the furry best friend lying at your feet.

When, in 1977, Pepperberg began teaching Alex to use words to communicate, the consensus was that animals could be taught to associate sounds with objects (“Go get your ball,”) but not concepts. Concepts are abstractions that live only inside your brain. For example, try picking up a “bigger” or giving someone a “different” as a birthday present.

The argument used to be that non-human animals could only respond to something directly in front of them, and weren't capable of the kind of cognitive gymnastics that abstractions require. However, Pepperberg's research taught us that not only could Alex use words to label an object's shape, form and color (“Alex, pick up the blue triangle out of all the other objects on the tray.”), he had little trouble grasping concepts like “different” and “bigger” (“Alex, what color is the object that is shaped differently from all the rest?”).

Alex's thought processes, and the way he communicated them, went far beyond answering questions put to him during his training sessions. One day, while looking in the mirror, Alex said “What color?” Mind you. Alex had been trained to answer questions, not ask them. When the surprised trainers answered “grey,” Alex was then able to identify other grey objects.



That wasn't the only time Alex surprised his handlers. I am still amused by a video I saw of Alex working with an impatient trainer. After several interactions, clearly frustrating for person and parrot alike, Alex belted out, in a startlingly clear Bronx accent, “Go away!” But the bird's most compelling vocalization took place when Pepperberg had to leave him alone, for the first time, at a veterinary clinic. As she walked away, Alex said in a soft and quiet voice, “I'm sorry. I love you. I'm sorry.” (This knowledge has made leaving my dogs at a vet clinic a hundred times harder for me, and I pass it along to you with my own soft and quiet, “I'm sorry.” Ignorance indeed can be bliss.)

When Pepperberg first began working with Alex, there were suggestions that certain other animals could understand simple concepts, but it's only been during the last 20 years that this issue has gotten the attention it deserves. We've found that many animals – including rats, pigeons, and a surprising star in cognitive research, the octopus (honest) – can functionally use concepts like “different” and “bigger.”

But what about our dogs? If an octopus can understand the concept “different,” surely our dogs can too. Or can they? Until very recently, research on our best friends has lagged behind that on primates and laboratory rats; apparently, “familiarity breeds contempt” in science as well as in the rest of life. But dogs are finally becoming hot topics in cognitive research – check out, for example, recent issues of the *Journal of Comparative Psychology*.

Here's a little about what we've learned so far. Research confirms that dogs can also functionally use concepts like “larger” and “different.” What's more, in certain contexts, they can also be taught a more complicated procedure called “delayed non-matching to sample.” Here's how the experiment works: The dog is presented with an object that has a piece of food underneath. He's allowed to move the object and get the food. Then, after a delay of a varying amount of time, say, 10 seconds, the dog is presented with two objects. One item is the same as before, the other is different. The “right” choice is the different object.

When researchers first conducted the study, the dogs failed miserably. After hundreds of trials, the dogs were still unable to identify the different object. In comparison, rhesus monkeys figured it out pretty quickly. But when the researchers changed the procedure and asked the dogs to choose an object in a different location, our best friends turned into academic stars, getting the answer right 90 percent of the time – even after waiting 20 seconds between presentations.

So, here's where musings about cognition leave the land of the research lab and settle into your living room. Of the words you use (whether they reference actions, objects or concepts), how many do you think your dog understands? The answer may be more complicated than we think. Let me illustrate with a story:

Last night, as we have for many nights, my young Border Collie, Will, and I worked on his ability to label objects with names. He is the fastest canine learner I've ever had – and that's saying something, since I've had many other dogs, seven of them Border Collies. This dog learned to lie down on his side for acupuncture in less than five minutes. He learned to stretch out his foreleg on cue in less time than I can write about it. I can ask him to “Go get your toy,” five minutes after he has dropped it 200 yards away and he will retrieve it. In short, he's one of those “oh-wow” dogs who makes training look easy.

But when I ask him to pick out his “ring,” or his “ball,” he looks like a dunce. For three weeks, I've reinforced him for touching a toy after I've said its name. I started with one object at a time, saying the name “ring” or “ball” and reinforcing a correct response with treats or play. I've done that hundreds

of times, and if the only toy visible is the one I ask for, he's – not surprisingly! – always right. Recently, I've been placing two objects on the floor and asking for just one of them. At first, I make the right choice easy by placing it close to him, while the “wrong” object is farther away. But as soon as Will has a real choice, his accuracy plummets and his responses become random. He enthusiastically chooses one, and then deflates when I slowly shake my head no. Over and over, he desperately tries to figure out what I want him to do. For a while, he was choosing the last location reinforced. When he realized that wasn't it, he lay with his head down on his paws.

I didn't think teaching him “ball” and “ring” would be that hard. After all, when I say, “Get your toy,” he picks up an object without hesitation. As I mentioned earlier, we've known for years that dogs can use sounds to label objects (you might well have a dog who knows his ball from his tug toy). Rico, the famous European Border Collie, not only knows the names of more than 200 objects, he could match an unfamiliar name with an unfamiliar object in a carefully controlled experiment. How could my brilliant little dog be such a slow learner?

I think Will's struggle relates to concepts. Until I began to ask him to choose one toy over the other, the sounds I made to Will had always been associated with actions: Lie down. Walk up. Wait. Bow. Get your toy (go pick up something). It looked as though he understood that “toy” referred to play objects – except when I experimented and said, “Go get your –” and he immediately picked up the closest object. When I asked him to “Go get your wallaby,” he hesitated a moment, and then picked up the closest toy.

Will has also heard me repeatedly say in a happy, animated voice, “Where's Jim?” I've enthusiastically asked that question every time our mutually favorite guy arrives at the farm. Recently, I asked “Where's Jim?” while Jim was sitting on the couch beside us. You guessed it: Will ran to the window and danced around with excitement. So what initially appeared to be an understanding of the names of things is really more about associating the sounds I make with actions he should take.

Naming seems like such a simple concept, yet many of us can remember the scene in the movie *Helen Keller*, when, after infinite periods of frustration,

Helen finally realizes that the sign she is being taught stands for the cold water running over her hand. Another riveting story is told in the book, *A Man Without Words*, by Susan Schaller. She describes a deaf man who had never been taught even the most basic communication skills bursting into tears when he first realizes that objects could be labeled, and signs could be used to converse with others about those objects.

I'm sure Will's "Helen Keller" moment will come sometime in the future, but in the interim, his struggles are a constant reminder of the ongoing challenge to understand what's going on in our dog's brain. It's important to understand which concepts dogs understand which they don't. Keep that in mind, and think of the following questions as wonderful ways to entertain yourself and your dog through the last cold days of winter: How much of what you say does your dog understand? What could you do to try to find out? What type of everyday concepts does your dog understand? Does your dog understand that the words you use can represent both actions and objects? Can you teach your dog to distinguish "larger" from "smaller"? You may get some definitive answers, or you may generate more questions, but whatever happens, you'll keep your dog's mind (and yours) entertained and engaged until spring arrives!

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