

Both Ends of the Leash

Point Taken

Have dogs evolved to follow our lead?

Patricia B. McConnell

Last night, Willie took his eye off the ball – literally. I tossed his toy to the right while he was looking left, and when it didn't appear where he expected, he turned and looked at my face, as though to get a clue as to where it might have gone. To help him out, I extended my arm to the right and pointed with my finger in the direction of the toy. He took a step to the right – and licked my fingers. Then he kissed my face. If I hadn't been laughing so hard, I would have tried pointing again, but by then, I was pretty sure the gesture was futile. This from a dog who has been taught to move in the direction of an outstretched arm when we are outside, and this from a species that, according to some, inherently understands a human pointing gesture.

The suggestion that dogs, unlike other animals, inherently know to look in the direction of a pointed arm comes initially from the work of scientists Tomasello and Hare. While working with chimpanzees, they were surprised to find that in a classic shell game, animals who share 98 percent of our genetic makeup weren't able to follow a pointing gesture to win food. Out of sight of the chimps, the researchers hid food under one of two containers, and then, as the primates watched, pointed toward the correct choice. In spite of multiple repetitions, the chimps' responses were no better than random chance. They didn't seem to be able to associate the gesture with the location of the food.

Both researchers were surprised at the results – the message behind a pointed arm seems so obvious to us, and chimps are, after all, our closest relatives. In a classic moment of dog-lover pride, Brian Hare told Tomasello, “Even my dog could do it.” Though Tomasello was skeptical, it turns out that Hare was right. When they tested Hare's dog, and a variety of others, the dogs chose the correct container more often than chance, and blew the brainy chimps' test results out of the water.



As they continued this line of inquiry, it appeared that dogs were not only superior to chimpanzees in this particular skill, but also superior to captive wolves, who likewise were unable to use “human social cues” to locate hidden food. These results led to the suggestion that “dogs have been selected for a set of social-cognitive abilities that enable them to communicate with humans.” (Hare et al. 2002) This idea – that dogs are inherently better able to communicate with humans than any other animal – is a seductive one, and has been taken up by scientists from a variety of fields.

Meanwhile, out of the laboratory and into the living room, those of us working and living with dogs were coming up with different observations. For example, puppies don't seem to follow the direction of a pointed arm, but rather tend to fixate on the hand or fingers. Adult dogs do the same until they have been taught to look in the direction of the point. This is a relatively easy thing to teach – Retriever and farm-dog trainers do it all the time – but still, it seems as though it needs to be taught. Even changing the context, as I did with Willie, can throw a dog into focusing on you or your body rather than the direction you want them to look or move toward.

This seeming contradiction, and some of the discoveries that have resulted from it, is a lovely example of how science works – not in some neat, linear way, but by dipping first one way and then wafting another, until finally settling, like frost on a clothesline, onto threads of truth that link two different perspectives. A lot of work has been done since Tomasello and Hare came out with their initial

findings in 1999, far too much to describe in this column, but here are some of the highlights.

As is often true in the study of behavior (and life!), things got much more complicated before they became any clearer. Researchers looked carefully at the gestures that were actually being used, trying to tease out which movements were most relevant to dogs and other animals. The original study included not just a pointed-arm gesture, but also a turned head and a gaze directed toward the container with food. The pointing gesture alone was less effective, but even then, the results were mixed. Some researchers found that only dogs could follow a point, while others found that animals as genetically removed from our species as dolphins and seals were able to interpret the meaning of a pointed arm.

Some of the best work to come out of this inquiry has recently been done by a psychology graduate student, Monique Udell, working with Dr. Clive Wynne at the University of Florida. Udell suspected that environment and context were critical variables, so she set up her experiment to test dogs and wolves in a variety of contexts. She gave companion dogs, shelter dogs and hand-reared wolves a chance to get a food reward if they followed a pointing arm. She tested the “owned” dogs inside and outside, the shelter dogs in the shelter, and the wolves with no barrier between them and the “pointer” (a potentially confounding factor in some of the other studies). Only a pointing gesture was used; the gesturing person stood still, facing forward and avoiding eye contact with the subject, and moved one arm toward one of the containers. In the case of the dogs with guardians, she also varied who did the pointing, the guardian or an unfamiliar person. As importantly, she is the first researcher I know of to adequately control for scent cues. Most studies had food in both containers, but extra food in the “right” one. Surely a dog who could find a gram of cocaine in a warehouse of coffee could tell the difference between “some food” and “more food.”

She accumulated enough data to fill this entire issue of *Bark*, but here are the most important results: Hand-reared wolves tested outside, without a barrier between them and the pointer, scored just as high as pet dogs who were tested inside. Both groups did well, scoring correctly about 70 percent of the time. (Note: That’s a far cry from 100 percent, which

would be expected if the animals inherently and instantly understood the gesture.) Pet dogs tested outside didn’t do well regardless of who was doing the pointing, and shelter dogs tested inside also scored no better than random chance. Testing the dogs who initially did well inside, but this time with a fence between them and the pointer produced results of no better than 50/50 – about as well as wolves have been shown to do in the earlier studies. That’s not the data you want to see if you are arguing that dogs inherently understand human gestures better than wolves or other wild canids, since it fails to confirm the belief that dogs have genetically adapted to better communicate with us. Rather it makes a strong case for nurture over nature and for experience and context.

Ongoing research should help us sort out these tangled threads. In the best tradition of ethology, Udell is continuing her studies to determine exactly which of our gestures – eye movements, a turn of the head, a shift of our shoulders – are relevant and meaningful to dogs. Others are working with wolves and primates, pursuing the results of a single study that, as is so often true in science, has led to a flurry of interest in the questions it raised. All this from a simple statement made by a (then) graduate student and the willingness of his major professor to consider a dog as a valid subject of scientific inquiry.

How about your dog? What does your pup do when you lift your arm and point to the left or right? Does it make a difference if you look that way too? And if he follows the direction of your point, did he learn that from you? Your dog’s responses are of great theoretical interest to scientists, but they are of equal interest to anyone who would like to learn more about communication between the two species that share a couch. Go ahead – be the Jane Goodall of dogs in your living room, and see what your dog has to tell you. Just one thing: if your dog lifts a foreleg and points to the door when he wants to go out, let me know. He’ll make the cover of *Science* magazine, and won’t you be proud!

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References

Hare, Brian & Michael Tomasello. 1999. Domestic dogs use human and conspecific social cues to locate hidden food. *J. of Comp. Psych.* 113(2): 173-177.

Hare, Brian et al. 2002. The domestication of social cognition in dogs. *Science* 298(5598): 1634-1636

Soproni, Krisztina et al. 2001. Comprehension of human communicative signs in pet dogs. *J. of Comp. Psych.* 115(2): 122-126.

Udell, Monique et al. 2008. Wolves outperform dogs in following human social cues. *An Beh* 76: 1767-1773.

Udell, Monique et al. 2010. The performance of stray dogs (*Canis familiaris*) living in a shelter on human guided object-choice tasks. *An Beh* 79: 717-725.