

Reading Dogs Reading Us¹

ALEXANDRA HOROWITZ

Adjunct Associate Professor
Department of Psychology
Barnard College

Thank you for having me here at the American Philosophical Society, and thanks to Judith Shapiro for inviting me. I study—I believe it or not—dog behavior and cognition, a relatively new and exciting field, especially for those of us who are interested in learning more about things right in front of us, things we thought we knew everything about.

In this paper, I am going to talk a little about the “dogness” of dogs. There are lots of ways to approach this topic—i.e., beginning with domestication, talking about intelligence (a somewhat fraught topic), and looking at different breeds—but what I’m particularly interested in is a recent approach in science of which I’m an advocate. This approach tries to understand the dog’s point of view—what it is like to be a dog—using the research of cognition and sensory abilities of dogs to guide us. The ultimate idea is to improve our relationships with our dogs.

I’ll begin with a short introduction to our species of interest. I’ll then talk about some of the research indicating how good dogs are at “reading us” (i.e., reading our behavior), as well as my own research indicating that we are not as good at “reading dogs.” Finally, I’ll provide more details about dogs that may allow us to improve our understanding of the dog’s point of view.

To begin: What is the dog? This question is not as straightforward as it may seem. Dogs are not quite wolves, nor are they furry people (although we sometimes treat them as such). The beginning of the story of how we got from *Canis lupis* to *Canis familiaris* is that the present-day dog and the present-day wolf share a common ancestor: a wolf-like creature from which they both descended. The dogs then diverged from these wolves and became domesticated. In my view, the best story of domestication is that about 10,000 or 14,000 years ago, early wolves exploited a new ecological niche: us. We (i.e., early humans) stopped being nomadic; we started settling in permanent spaces; and we threw things out. We created trash right outside our settlements.

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This trash was a potential food source for those wolves that (a) self-selected; (b) were less fearful of humans; and (c) were willing to be scavengers, not just predators. After this early self-selection happened, apparently humans began the process of artificial selection, based on their preferences for certain behaviors, such as canids that attack strangers or wolves who are considered “really cute.” “Cute” might mean that the animal had a large head or really large eyes—more or less the exaggeration of features we see in human infants. This story has been tested in some sense by reproducing the process with foxes.

In the mid-twentieth century, the Russian geneticist Dmitri Belyaev decided to study foxes being raised for fur. He selectively cross-bred some of them, beginning with 130 and choosing the ones with the least reactivity to him. This strategy was integral to his method: the least reactive animals were the ones who were not scared off when he approached them with food; indeed, they might approach him and even take the food from him. He cross-bred those, and the others were used for fur.

After 30 generations over about 40 years, what he had developed was a “domesticated elite”: 75% of his foxes were *tamed*. They were whimpering for his attention; they had floppy ears like dogs; they had piebald coats and short legs; their tails went up and curled; and they had smaller skulls. He had, in essence, re-created a domesticated canid. His experiment suggests that domestication might have happened similarly.

I mentioned that dogs and wolves share a common ancestor. This fact will provide one entry into an understanding of dogs; that is, looking to the wolf explains some of the dog’s behavior. But there’s an important difference between the species, and I want to focus first on one element of that, specifically, what makes the dog different and has made him so successful among humans.

Dogs are very good readers of us. I sometimes call them “anthropologists” among us. You might recognize this trait in your own dog: perhaps you have noticed how they can distinguish among your getting-up-to-go-for-a-walk rising, your going-to-the-refrigerator rising, and your turning-on-the-computer rising. I think it behooves us to read dogs as well as they read us.

The first step to their reading us is simply that they watch us. We are the object of their interest and attention. They look us in the eyes and make eye contact—something no other nonhuman animal reliably does. Among wolves, looking another animal in the eyes is a threat. For dogs, it is the door to communication; intimacy; and a feeling, on our part, of shared understanding between us and the animal.

The ability to make eye contact enables all sorts of what researchers of animal cognition call *social cognitive skills*. A few behavioral studies

have tested the extent of dogs' social cognition. For instance, one line of research asks if a dog can understand human pointing. In a typical paradigm, a dog is presented with two overturned buckets. Under one bucket is a piece of tasty food; under the other, nothing (although both are scented to control for the dog's good sense of smell). Can the dog figure out which one of the buckets to approach? They have only one clue: a person standing behind the buckets pointing at one bucket or the other.

Dogs perform this task extremely well. They can follow all sorts of unusual points, including a cross-body point and "pointing" with the legs or body. (However, they cannot follow elbow-cross pointing, which I think is difficult even for people). This level of performance by dogs is higher than that of any other nonhuman animal, including apes.

If dogs are looking us in the eyes, they then start to understand what we call our "attention." Dogs are capable of doing what children learn to do: they distinguish between someone with their back turned, their eyes closed, or their eyes open, in terms of what they can get away with. In another research paradigm, owners lay a treat on the floor and forbid the dog from eating it. The owner then proceeds to, in different conditions, leave the room, turn his back while seated in the room, or sit quietly while facing the dog and treat. The dependent variable is how long it takes the dog to disobey and eat the treat. Well, dogs immediately eat the treat when the owner leaves the room; they take a little longer if the owner's eyes are closed or if their back is turned; and they take a more indirect (and slower) route if the owner is looking at them.

One might ask if they listen to us as well as they watch us. This question is reminiscent of Gary Larson's cartoons in which "what we say to the dog" is translated by the dog as a variation on "blah blah Dog blah blah." Larson gets a lot of animal behavior right. In this case, he's not incorrect that dogs mostly just understand the words that are said to them—that is, their names. On the other hand, consider Chaser, a border collie who John Pilley and his colleagues revealed could find, retrieve, or touch (via a painstaking process of exposure and training) any of the 1,022 different toys requested of her by name. Even Pilley could not remember the respective names of each item; he had to write the name on the toys. So, it might just be that we are not asking enough of our dogs—but they are actually listening to us.

Apart from the cognition work, dogs have seemingly miraculous abilities to diagnose disease. Without going into details, I can tell you that dogs trained on the scent have been found reliable (even better than practitioners in some cases) at identifying breast cancer, lung cancer, bladder cancer, and melanomas. In the typical paradigm, a trained dog is presented with, for instance, different urine samples and identifies—through sniffing—the sample that has signs of bladder

cancer. Some dogs, whose owners have epilepsy have even been reported to anticipate their owners' seizures.

The dog's ability to "read" the human can be contrasted with the human's ability to "read" the dog. For the most part, whether we are dogowners or not, we *anthropomorphize*; that is, we use human characteristics to try to describe nonhuman animals. We assume animals feel as we do, know more or less what we know, and want roughly what we want. Picture a dog donning a raincoat in the snow: a classic instance of anthropomorphizing in which the owner assumes the dog wants his body covered as humans do. I think you can look at that dog's face and know that perhaps we're wrong about that attribution.

As it happens, domestication, and the changes wrought thereby, made the dog easy to anthropomorphize. Because they read us so well, we assume they are just one of us. One set of research questions that interests me is: Are these anthropomorphisms we make correct? How good are we at reading dogs?

Before I tell you about some studies on those questions, I first want to address the related question: Does it matter if we anthropomorphize? I will argue that, for two reasons, it does. First, there are sometimes incredible consequences when we assume that animals are operating with the same understanding as we are: for instance, when we assume they understand the difference between right and wrong.

As E. P. Evans has aptly demonstrated, from the Middle Ages to the nineteenth century, criminal proceedings were pursued against all manner of animals for alleged crimes against humans. For instance, in 1519, a group of field mice and moles were accused and, by the court of the land, convicted of burrowing into the earth so that "neither grass nor green thing could grow." They were banished from the field, with a 14-day reprieve so that the very little mice would have time to grow up.

Often it was pigs, quite common in medieval streets, that were tried and convicted, for instance for pushing over and killing a child. Typically they were dressed in men's clothes and hanged in the public square.

Earlier, in Zoroastrianism custom, dogs who bit people were punished by being subjected to progressive mutilation depending on the number of bites they inflicted. First, their ears were removed, then their feet were crippled, then their tails were amputated, and so on. This kind of behavior may seem extreme, but it is the logical extension, it seems to me, of our anthropomorphisms. The second reason that I care (and think that we should all care) about anthropomorphisms is because in more contemporary times, they allow us to justify our drive to, say, dress dogs in Halloween costumes. I've seen dogs dressed as Trekkies, leprechauns, and even McDonald's Happy Meals.

I will not make the argument that whether one dresses a dog in a

French fries costume is a moral issue. Instead, I want to observe that where dogs are close and loyal observers of us, we seem to not extend the same considerations to them.

I became interested in empirically investigating anthropomorphisms because of the frequency with which owners attribute emotions to their dogs. Few scientists will disagree that dogs, neurologically and behaviorally, plainly experience primary emotions, including sadness, joy, surprise, and fear. But owners also attribute many “secondary” emotions (i.e., embarrassment, shame, disgust, guilt, empathy, pride, fear, jealousy, or having a sense of fairness) to dogs. For instance, a survey by Morris et al. (2008) asking people if domestic animals expressed emotions found that three-quarters of individuals felt that their dogs experience guilt, and 81% believed their dogs had shown “jealousy.”

I’m going to focus on these two attributions. My research program in this regard has been to, first, determine the behaviors that prompt these attributions of emotions and, second, investigate the actual contexts of that behavior—in other words, to see if our reading of dogs is as good as their reading of us.

First, the question of guilt. This is the question of whether dogs know what they are doing when they knock over the trash can or maul our shoes, reflect on it, and maybe later feel guilt for having done it. I was encouraged in this research by the tragic case in 2006 of an English Doberman, Barney, who was—maybe unwisely—left in charge of a \$900,000 collection of irreplaceable teddy bears, including Elvis’s teddy bear Mabel. The scene that detectives discovered in the morning was one of destruction. Here is a description: “Heads were pulled off; arms, legs, here and there. It was a total carnage. There was stuffing, fluff, and bear bits everywhere.” The dog had methodically, ruthlessly, perhaps with a gleam in his eye, disemboweled one teddy bear after another. “But,” some said, “he looks contrite.” Is he contrite?

As a researcher of behavior, I looked for clues in his outward appearance. I ran a straightforward study to disambiguate what is widely recognized as the “guilty look” to see if Barney’s look showed, as Darwin himself suggested, that dogs might be feeling shame for their actions. I designed a methodology, recruited dog owners, went to their homes, and asked them to act out a scene with their dogs. The method was as follows: Owners asked their respective dogs to sit, and they then placed a yummy treat a foot away from their dogs and directed them to not eat it. Then the owners left the room. There were two conditions, each with two sub-conditions: the dog could either obey or disobey (i.e., either the dog did not eat the treat or the dog did eat the treat). I then called the owner back to the room and reported what had happened in their absence. I asked that they either (a) greet the dog if



FIGURE 1. Photograph by Julie Hecht.

the dog had been obedient or (b) scold the dog (which owners did gently) if their dog had disobeyed.

Sometimes the appropriate thing happened: an obedient dog received a happy greeting, and a disobedient dog was scolded (Figure 1). However, sometimes I misled the owners. For example, if the dog had eaten the treat, I would sometimes tell the owner when he or she returned to the room, “They didn’t eat it; they’re innocent.” As a result, the dog was greeted by the owner. Other times, if the dog had not eaten the treat, I would say to the owner when he or she came back into the room, “Actually, they did eat it,” and so the dog was scolded.

I videotaped the whole affair and then examined the video recordings frame by frame, looking for how much “guilty look” the dogs were showing in all conditions. The elements of the guilty look were generated from previous scientific accounts and owner reports. Some of the elements are “rolling over,” “ears down,” and “averting gaze” (Figure 2, 3, and 4). It’s a very powerful look, is it not?

Here is what I found. Guilt did not change the rate of the “guilty look”; in fact, the rate of the guilty looks was similar whether the dog was or was not guilty. However, owner behavior did change the rate of the guilty look; that is, the rate of the guilty look was significantly higher when the dog was scolded than when the dog was greeted. Dogs showed the most guilty look, interestingly, when they were not guilty but punished as if they were. In other words, dogs have a guilty look—but it doesn’t map only to when they’re guilty. Instead, they might put on this look to appease us when they sense that they are about to be scolded, probably having learned that this look might help them avoid



FIGURE 2 (top left), 3 (top right), and 4 (bottom).

punishment. (An interesting side note: When I divided up the subjects into groups based on their participation in obedience classes, I saw that the dogs who had been in obedience classes displayed a significantly more-guilty look in every condition than the non-obedience class group.)

As jealousy is the most common attribution of a secondary emotion to dogs by owners, I wanted to look for its root in a sense of fairness that's being violated. As dog trainer Steven Lindsay wrote, "An appreciation for fairness seems to emerge in dogs in the context with play." There's some precedent for thinking that dogs have a sense of fairness. I've done research with Marc Bekoff on play behavior in dogs, which indicated that participants who violate implicit rules of play are spurned as playmates. There is no play with poor rule-followers. So, by my *modus operandi*, the next step for me was to identify the behaviors associated with appreciating a sense of fairness, which seems to be "avoidance of situations which are unfair."

I conducted a study in which we created a situation that was unfair. Essentially, the subjects and a control dog approached two people (one of which was designated the "fair" person and the other the "unfair"

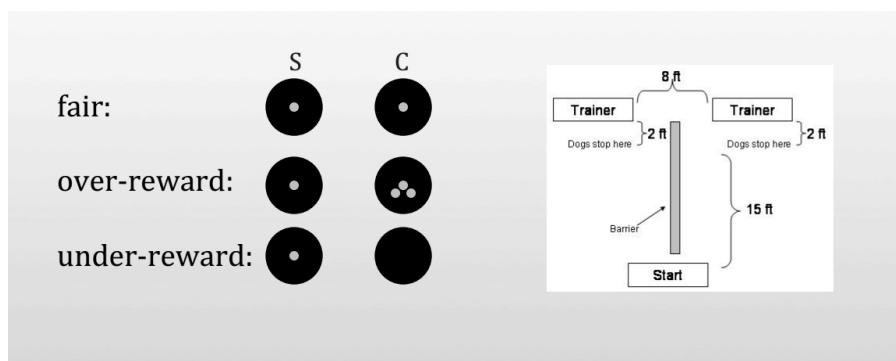


FIGURE 5.

person), who asked the dogs to sit and then rewarded them with small pieces of hot dog.

The fair person always gave both the subject and the control one hot dog treat. There were two kinds of unfair persons: those who always gave the control dog more than the subject dog, and those who gave less to the control dog than the subject dog. The protocol was designed to see if dogs distinguish these fair and unfair conditions and is modeled on human research showing that human subjects prefer situations in which they and a partner were paid fairly for the same amount of work, rather than one in which they are underpaid or even overpaid.

Figure 5 shows the number of treats that the fair and the unfair persons gave to the dogs. The fair person always gave the same amount. In one case, the unfair person over-rewarded the control dog, giving him three hot dog pieces instead of one for the task of sitting on command. In the other case, the unfair person gave the subject the same number of treats as the fair person had (i.e., one) but gave the control dog nothing.

And so the question was really whether the subject dog had any interest in what was happening to the other dog. Did the subject dog notice when treated “unfairly”—either to the dog’s benefit or detriment? The key is that the subjects are always being treated the same: they are always getting the same number of treats.

Figure 6 shows some of the subjects learning about the trainers, with the unfair person on the top (you can see that the dogs are very attentively looking at the plates of food) and the fair person on the bottom, giving both dogs the same amount of food. (The control dog is black in both images.) The subjects were then tested by themselves: each dog was given free choice between the fair and the unfair person. My question was: With whom do they want to affiliate?

The results can be summed up in this statement: “Fair is fine, but



FIGURE 6.

more is better.” Dogs selected the over-rewarding person over the fair person at significant rates. They chose randomly between the fair and under-rewarding person. Remember: The over-rewarding person had given more food to the *other* dog.

If the dogs had been like humans, they would have preferred the fair person, but in every case, these dogs never did. When they did make the discrimination, interestingly, they chose the person who had given them less. Why? I suggest that they’re not attending to fairness, but they might be attending to quantity, a choice that is interesting because although they were given less, perhaps one could say they are

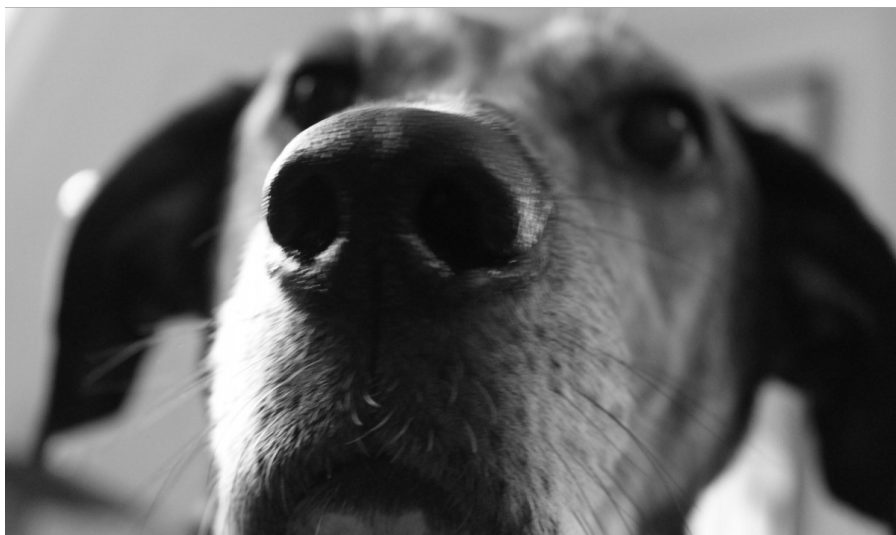


FIGURE 7.

internal optimists. They're going where they see they have the potential for more food, even if it's never been given to them.

This research is beginning to show the ways in which we misread the dog. We see him as guilty when he's really just trying to appease us; we see him as jealous when he really just wants more. So, I want us to reconsider the dog from his point of view.

Figure 7 represents how we see dogs, but Figure 8 represents how they see each other: from the other side, the rump. We're entirely misdirected in our thinking about dogs. Dogs can read us in our gestures, our gazes, our diseases, but we assume that dogs like costumes and they feel emotions in the same way we feel emotions.

I think it's better to be an observer of dogs and appreciate how different their world is, beginning with the nose and an understanding of the nose. Briefly, I want to point out a few facts about the biology of dogs that can allow us to read and imagine the dog's point of view.

Humans have about 5 million olfactory cells in our noses. Dogs have hundreds of millions more—from 2 hundred million to 1 billion cells (Figure 9). In other words, a huge amount of a dog's nose and brain is committed to understanding the smells of the world, smells that we mostly try to avoid detecting.

I think of the dog as having two noses: the first nose that you recognize (Figure 10), and the nose that is in the upper palate of the mouth—the vomeronasal organ that actually many mammals have (Figure 11).

This vomeronasal organ allows dogs to detect hormones from a range of sources—in the air, on your body, on the lamp posts, on the



FIGURE 8.

fire plug at the side of the street. Not only do they have this much more intense olfactory experience, but they can also sniff better than we can. We have to sniff clumsily in and out of the same nostrils, inhaling and then exhaling the same odorant molecules, but dogs exhale out of the side slits of their noses. As a result, they can keep inhaling continuously to get more of that smell inside their nose, and even these exhales help



FIGURE 9.

to hurry in the next smellful. Through high-speed videography, researchers have captured the movement of air around expiration (i.e., exhaling), which shows that dogs produce what researchers call “expired turbulent canine nostril air jets,” which encourage more smell to come into their noses with every exhale.

This way of sniffing allows dogs to perform quite impressive tasks. So while we might be able to detect which direction the person who left a set of footsteps along the beach was going, what happens when the water comes and covers the footprints? It’s a little harder for us to tell. But a dog can tell, and this is why: The most recent footstep smells the strongest. Tracking dogs can distinguish someone’s direction over two to three footsteps by the difference in the concentration of odor from one step to the next.

Nose beats eyes, and this means in the everyday experience of dogs, their role is mightily different than ours. I want to give you just one example of this as I close.

Figure 12 shows a wall leading into the park right near where I live in New York City. I could tell you a great deal about this wall: I know the park it leads into; I know who frequents the area; I know what the trees are behind it, that in the distance you see New Jersey; I know who made the wall; and I know the substance of which it’s made.

But I was curious about the dog’s experience of this wall. So, I waited for a few minutes with my camera to see. Figures 13, 14, 15, and 16 represent what I saw.

Dogs who passed all experienced the same corner of the wall and, of course, this is why (Figure 17): their view of the scene is olfactory.

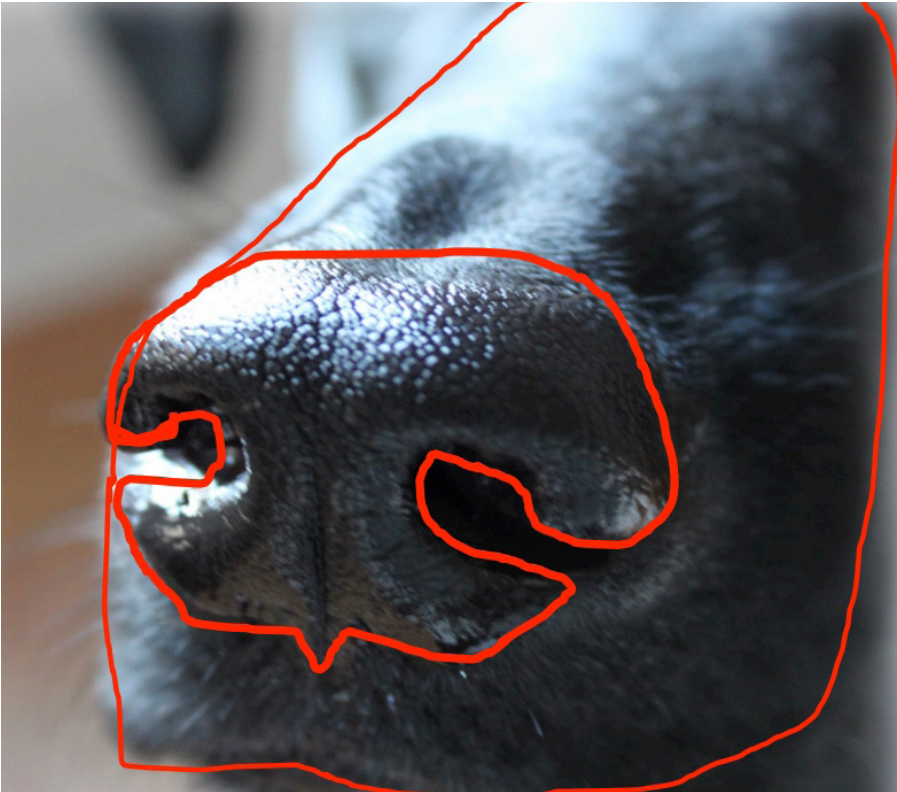


FIGURE 10.

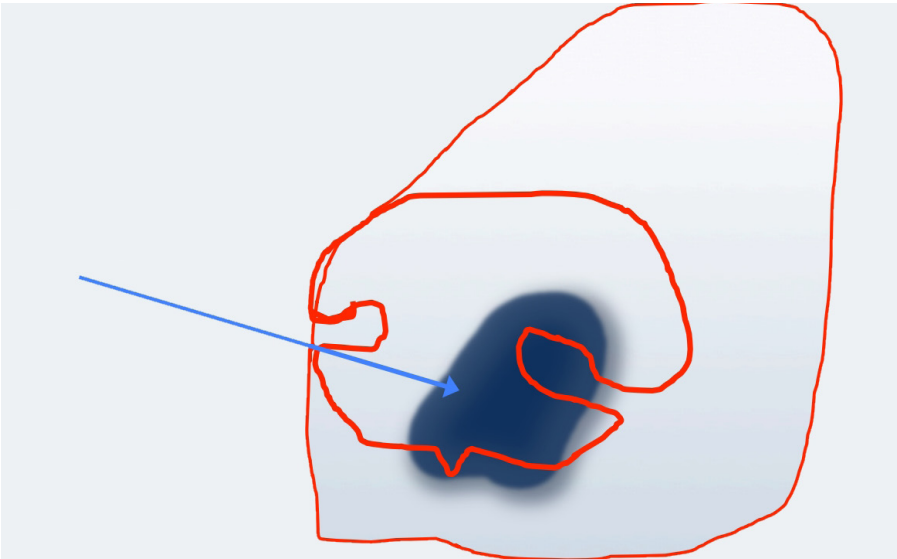


FIGURE 11.



FIGURE 12.



FIGURE 13 (top left), 14 (top right), 15 (bottom left), and 16 (bottom right).

What they notice is not the stonework nor the view across the river; it is the fascinating information left by dogs who had previously walked by. This information will truly be ingested in that nose and vomeronasal organ.

John Dewey once said, “The dog is never pedantic nor academic.” Taking that as a cue, before I get too pedantic or academic in my tone,



FIGURE 17.

I will retire and thank you for your attention. Please, reconsider the dog, from the dog's point of view.

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