

A Dog's Sense of Self And Others

Part 3: Behavioral Research in Companion Dogs

As stated in part two of this three part series, I spent many years studying the development of chimpanzees and their acquisition of American Sign Language (ASL). I noticed in our hundreds of codes of behavior similarities to domestic dogs.

Despite what I thought had potential importance, similarities of development in highly social species such as mammals, there has been very little systematic research in this area for dogs.

Virtually all of the relevant research has been conducted with human and non-human primates. We know more about primate skills of gaze following, than what each bark of a dog means. Why is this so? Let's start from the beginning of the study of animal behavior, which ironically enough begins with the common dog, *canis familiaris*.

Back in the infancies of experimental psychology and animal behavior, Ivan Petrovich Pavlov, a Nobel Prize winning Russian scientist, was interested in the conditioned reflexes of certain behaviors; for example, the leg twitch or pull, the salivary gland activation when food was presented, and so on. He chose as his subject, the domestic dog. Why did the dog pull his leg away when it was pinched? Could he make the dog do this behavior without pain as the stimulus? What seemed at first to be a simple reflex, soon became known as a conditioned reflex. Pavlov could indeed cause the dog to withdraw his leg before any pain stimulus was presented by conditioning the dog with an ASSOCIATED stimulus. He did this in 1901 (later he lectured on this in 1926), with his now famous research on salivating dogs. In brief, he sounded a bell as he presented food to the dogs. The dogs salivated and ate. Later he need only sound the bell and the dogs (in their anticipation for food) salivated. As a side note this is the beginning of operant and classical conditioning training of dogs – or clicker training.

About the same time, a German professor by the name of Wilhelm von Osten had a horse named Hans. Hans became famous all over Europe and the USA for his skill in math, languages, and art. Hans, it appeared was able to do complex mathematical problems in his little horse brain. Hmm. How? You query. Well, back to the start of this series of articles (see Part 1, communication). Hans being a social animal and a well trained horse, picked-up on very subtle cues unbeknownst to his owner. This would later be termed interspecies cueing. In fact, Hans was so good at his cue detection he could do his math with any one handling him, not just his owner...as long as that one handler knew the solution to the problem. What?! You say incredulously. Yes, indeed all he needed was someone who not only knew what the problem was but the solution as well.

It seems that every single disbeliever and skeptic who tested Hans also happened to be very good at math, languages, and the arts. So when the tester awaited the horse's answer s/he leaned ever so slightly forward. Then when the correct response was reached the tester would then relax and stand erect. The cue was so subtle (because each who tested was unaware of his/her cueing the horse) that it took a young scientist, Oskar Pfungst, to

say, "I know Hans is being cued, but I cannot detect the cue." So he took someone who did not know the problem nor the solution and this "blind" person held the horses lead for the demonstration. Time after time Hans could do no better than chance (in fact far worse than chance) when he had a blind handler. Hans was as brilliant as his handler was. If the handler knew the correct response so did Hans.

So devastating was this finding to the young fields of experimental psychology and animal behavior, that NO ONE wanted to study the behavior and cognitive abilities of animals. Today, however, scientists like myself look at the "Clever Hans" study as good and virtuous. We see it as a way not to make mistakes AND to see that social animals do indeed pick-up very subtle social cues even from another very different species

Virtually all of the relevant research has been conducted with human and non-human primates and their skills of gaze following. There are two basic experimental paradigms, and these have produced different sets of results. The first paradigm is simple gaze following in which one individual orients his head and eyes in a certain direction (sometimes accompanied by gestures), and another individual either does or does not orient himself similarly. The second experimental paradigm involves an informant looking toward (or pointing and looking toward) the location of food hidden under one of two opaque containers; this paradigm is called the *object-choice paradigm*. Surprisingly, domestic dogs have been found to be quite skillful in using human gaze to locate food in the object-choice paradigm, better than wolves and chimpanzees.

Not only has recent research braved the realm of gaze direction and cueing, but also dog language. Yep, you heard it here. Recently, Sophia Yin investigated the various barks of dogs. As you might have guessed, your dog does alarm differently for the UPS truck than for your arrival home. His bark for dogs passing through the yard is much more boisterous than when big creatures such as bears pass by. I suspect our dogs don't want to give their location to the bears, should the bears decide to stop in for a bite to eat.

Finally, through research we now know that dogs just want to have fun. Dogs produce a very distinct breathy exhalation through their mouths when they are playing, greeting a friend (human or canine), or when trying to initiate play. The very old saying is true, "and the little dog laughed."

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