

The APDT CHRONICLE

Summer 2013 *of the Dog*



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The Dognition Revolution:

How Cognitive Science Will Advance Our Understanding of Dogs

Jenn Merritt, CPDT-KA

Evolutionary anthropologist Dr. Brian Hare wants to inspire a new generation of “cognitive dog trainers.” Four years ago, Hare became keenly aware of the gap that existed between dog trainers and the advances in canine cognitive research. Founder of the Duke University Canine Cognition Center, Hare presented a lecture on the explosion of discoveries on canine cognition coming out of Duke and at other canine research facilities including Harvard, and several European facilities.

Afterward at a roundtable discussion, he was surprised to hear trainers discussing and referencing mainly the principles of behaviorism and operant conditioning techniques put forth by B.F. Skinner as they attempted to understand a dog’s learning abilities.

“Association-forming is not the reason dogs are so successful.” Hare contends that it is much more complicated, and that, in order to understand dogs, we have to look at what makes them so successful from multidimensional and evolutionary perspectives. He admits that there has not been enough dialogue between the professional dog training and scientific communities regarding advances in canine cognitive discoveries. Hare explains, “I did not realize how poorly all this amazing research since the 70s has translated, especially what we’ve discovered over the past 10 years. No cognitive scientist has written anything for dog trainers or had trainers in mind when they wrote something.” Hare wanted to provide trainers with a resource for understanding and applying the most up-to-date research findings on canine cognition. It’s not about if dogs are intelligent; it is about how they are intelligent, and measuring different types of intelligence accurately.

Hare explores this in his recently published book, *The Genius of Dogs: How Dogs Are Smarter Than You Think*, which he co-wrote with his wife and fellow researcher, Vanessa Woods. The book highlights the remarkable and improbable co-evolution of dogs and humans, the role of domestication in dogs’ cognitive development, how Hare and other researchers realized that studying dogs could lead to a deeper understanding of the development of human cognition and intelligence, and the incredible insight that’s been gained about dog cognition.

For example, one long-held belief is that dogs were “dumbed down” by domestication, when in fact they gained some remarkable human-like abilities. Through domestication, dogs acquired intelligence that allowed them to live and work cooperatively with humans but

also to learn things through social experiences with humans, much like human infants do. Hare adds, “What more powerful tool to harness than the human? That is each dog’s genius.”

In *The Genius of Dogs*, Hare recounts how his games of fetch with his boyhood dog Oreo led him and other researchers to realize that dogs are vastly superior to any other animal, other than humans, with regard to understanding human gestural communication. This is even true of puppies as young as six- to nine-weeks of age.¹ Hare and other scientists were fascinated that dogs could do something that our closest relatives, chimpanzees, could not. Could understanding how dogs acquired and use their cooperative abilities with humans give us new insights and advantages when it comes to interacting with and training dogs?

Hare feels that by taking a cognitive approach, you can identify a dog’s unique strategies for solving problems, which often involve using information from humans. It determines a dog’s flexibility or inflexibility, biases or constraints, and preferences, all of which help the dog navigate through the world successfully. We can then use that information to shape more efficient and effective communication and it can help us determine which training methods might be most useful with a particular dog. It can also explain why that dog is having difficulties learning a certain type of exercise or task. This could be especially valuable when we are training assistance, service, or military dogs. Hare adds, “In most dogs there is not much variability in their communication scores, but if a dog’s communication score strongly varies from the normal distribution of results, that’s significant. And that can explain why you are having problems.” Training plans and communication style can be adjusted to suit each dog’s cognitive style, with an increased focus on the power of using science based approaches. Hare continues, “I think that dog trainers unleashed could be the most powerful teachers who have ever been on this planet.”

But Hare admits that science is really slow. Research takes time, and there are only so many dogs who can be tested in trials like those at the Duke Canine Cognition Center, which sees 300-400 dogs per year. Living near Duke, I had already taken my dogs for various tests involving research through science-based games over the past several years. During those tests, I would sit in an adjacent room and watch the tests from a closed circuit TV. It was fascinating, but more than anything, I

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wanted to participate, and I really wanted to know how my dogs compared with other dogs.

Hare had requests from enough other dog enthusiasts that he contemplated the idea of recruiting dog owners as “citizen scientists” who could participate with their own dogs in cognitive research by playing similar science-based, cognitive games at home. This led to the creation of Dognition, a company Hare and his wife co-founded in 2012 to allow members of the dog-loving public the chance to better understand the unique problem-solving abilities of their own dogs through scientific games they can do at home. Hare hopes that Dognition may allow science to be more accessible and relevant to people who otherwise wouldn’t have access to it. He adds, “Powerful science doesn’t have to be hard to understand or explain. The assumption is only really smart people do research, and it has to be hard. Through Dognition, we can answer some really important questions, and people can participate in that.”

The Dognition experience involves a questionnaire and a range of science-based games called the Canine Assessment Toolkit. The assessment measures a dog’s abilities in five different cognitive dimensions:

- Empathy
- Communication
- Cunning
- Memory
- Reasoning

There are no better or worse scores, no right or wrong answers. It is all about the strategies that the dog uses to solve problems. The measure of these dimensions, along with the questionnaire, produces a profile report that categorizes dogs into one of nine cognitive styles, like a canine version of the Myers Briggs personality test.

Leaping at the chance to be a citizen scientist, I signed up two of my dogs, three-year-old Jet, who I would describe as highly driven, outgoing and independent, and her uncle, five-year-old Royal, who is lower drive, much more sensitive and bonded to people. I was especially interested to see how the results of two dogs who were so genetically similar, and raised in the same environment would compare, considering they have starkly different personalities. Going into it, I thought I had a pretty good estimation about how each of them would score.

The five-part assessment takes less than two hours, which I found most convenient to break into two sessions with each dog over two days. After logging onto the Dognition website, I filled out the multiple choice questionnaire about each dog. Then, I completed each part of the assessment by following easy-to-understand written and video instructions (also available as a smart-phone app for iPhone and iPad). Ideally, two people work together, one to hold the dog and record the results

directly on the Dognition site (or using the smartphone app), and the other to set up each test and do the cueing or gesturing. Items needed include high value treats, two cups, a few sticky notes and a few pieces of paper.

The test begins with empathy, measuring how a dog reads and responds to the emotions of others. The two parts of the empathy evaluation include a yawn game, to see if your dog responds to your repeated yawns and an eye contact game, which tests the amount of time your dog will engage in eye contact.

The communication portion of the assessment includes arm-pointing and foot-pointing games that measure how your dog responds to information from you about the environment.

Third, the cunning portion includes a series of games where dogs are asked to interpret different forms of social information to decide how to behave. For example, a treat is placed in front of the dog as the humans look away. Does the dog go for the treat or wait for a cue to eat it?

Next, the memory portion uses games to test spatial memory. It tests the dog’s preference to use his memory, new information gleaned from a gesture, or his sense of smell to make choices. In these games, the dog is purposely given misleading information and he must use a variety of problem-solving strategies.

Finally, the reasoning portion uses two games that measure flexibility in problem-solving, including the most challenging games of inferential and physical reasoning. The dog is shown that one of two cups is empty, and we see if he can infer that since one cup is empty, a reward must be in the other cup.

Not only were the exercises fun for me, my husband and the dogs, but it was truly fascinating to watch the choices that each of my dogs made. Although their strategies were completely different, both Jet and Royal stayed engaged and enthusiastic through the entire test. Upon completing each dog’s assessment, the Dognition Profile Report was instantly created and results provided confirmation for some of my predictions, along with some surprises.

Quite unexpectedly, Jet’s cognitive style was classified as “Socialite,” which indicates that her genius is in her cooperative and social interactions with humans. I was surprised at just how much Jet used information from me to be successful, and that she often used that information rather than logic to problem-solve. I truly thought that she would score as a much more independent thinker. Not surprising was how well she scored on the cunning portion, as she often appears endlessly clever and calculating. Her scores made me realize that she excels when I give her more information through gestures and when we work as a team, which I now make a point to do.



Jet's report provided very useful information that will help me with interacting with her in the future.

Royal's cognitive style is a "Renaissance Dog," which is described as a "jack of all trades." Instead of excelling in one area, Royal demonstrated good problem-solving ability across the board. Somewhat surprisingly, he scored as more of an independent thinker. In several tests, he used his memory rather than my gestures to solve the problems. His memory score was off the chart, which couldn't be more accurate. Sensitive by nature, I have always had to be very careful that Royal has good initial experiences, as he appears to remember when and where something makes him stressed. Royal's report confirmed that, when I'm teaching him something new, I've got to keep sessions short and really make it enjoyable. If he does encounter stress, I've got to minimize it quickly. I also realized that Royal possesses more flexibility than I was aware of and that I can take advantage of his excellent memory in future training.

Similarly, professional dog trainer Barbara Long, CPDT-KA, found that the Dognition scores of her dog Ambrose confirmed things she already knew, but also provided some unexpected insights into his problem-solving abilities. Long explains, "I've always considered Ambrose a lovable goof, so I wasn't surprised that his profile called him a 'Charmer.' His problem-solving results were a pleasant surprise." Long was also not expecting Ambrose's impressive scores in the memory and cunning sections. This new information has allowed her to refine her training approach with Ambrose. She continues, "He is much better at problem-solving than I gave him credit for. I've changed the way I train him and challenge him more, which he seems to like."

Upon completing the assessment, Dognition participants have the option of a continuing membership, to receive additional games that explore other cognitive abilities, to interactively compare their dogs' scores to others, and to continue participating within the Dognition community. Research ideas can be submitted and there are opportunities to ask questions of Dognition's Scientific Advisory Board and Expert Panel.

Long is hopeful that Dognition will give dog owners a new way to stay engaged with their dogs. She explains, "As an instructor I know that most students don't practice



with their dogs that much once they graduate from class. This is a way for students to continue to work with their dogs in a fun way. The dogs get some mental stimulation, the owner stays involved and the relationship and bond continue to develop."

Dognition also offers a Trainer Program, whereby trainers can become fluent in the testing procedures to help clients administer the Canine Assessment Toolkit, as well as refer training clients to collect information about a dog's learning style before classes or private sessions. Visit www.dognition.com/portal/trainer_apply for more information.

The information gathered by Dognition can not only provide valuable feedback to dog owners and dog trainers, but also could be the largest non-human data collection ever accumulated. It can contribute to future discoveries and help to solve real world problems. Long states, "I hope that Dognition will generate a large body of information about how dogs learn, how they relate to their owners, and that we can use that information to be more effective trainers and instructors." Dognition's data could finally answer questions that the public is most interested in about breed and developmental variations, how to optimize training, and more, but it could also answer the questions that scientists like Hare are most interested in. Ultimately, Hare believes that studying dogs is the best way to learn about ourselves and that it may lead to different ways of measuring human intelligence.

Although there is not currently an organized school of cognitive training within the dog training community, Hare is hopeful that trainers and dog enthusiasts will find a range of benefits with the cognitive approach through *The Genius of Dogs* and Dognition. He concludes, "My hope is that in a few years I'll hear people saying, 'I'm a cognitive trainer.'"

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