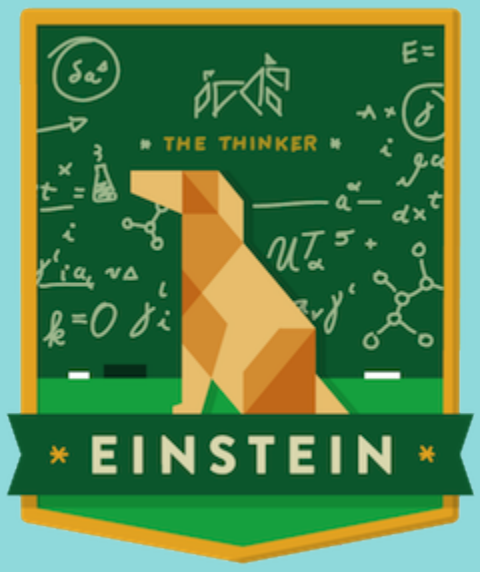


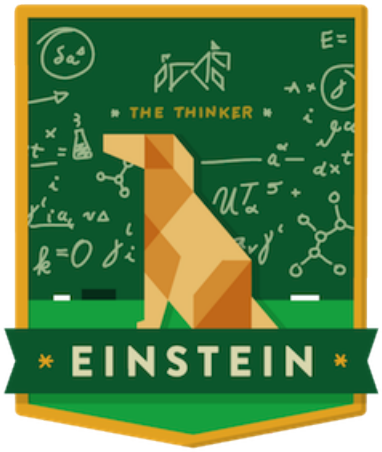
MOONA

DOGNITION REPORT - JULY 17, 2024

Dognition®

A KEEN UNDERSTANDING OF PHYSICS MAKES THIS DOG PRACTICALLY A ROCKET SCIENTIST.

Watch out; you may have a rocket scientist on your hands. Moona scored sky-high on independent problem solving, which means she has an excellent comprehension of the physical world. She is also able to make inferences, one of the key qualities of genius. Anyone can learn to solve a problem, but it is only by making inferences that we can flexibly solve a problem we have never seen before. Like many brilliant minds, Moona has a little difficulty with social graces. Moona seems to be more wolf-like when it comes to reading your communicative cues - either she struggles to understand them, or she may be ignoring them because she is so good at problem solving on her own.



THE DOGNITION PROFILE

Usually, when you get test results, you see a score that means you either passed or failed. To compare your results to someone else, you see who got the higher score. This is why your dog didn't take a test. Instead, you played a series of games together - and when you play a game there is more than one way to win. Success often comes from playing to your strengths.

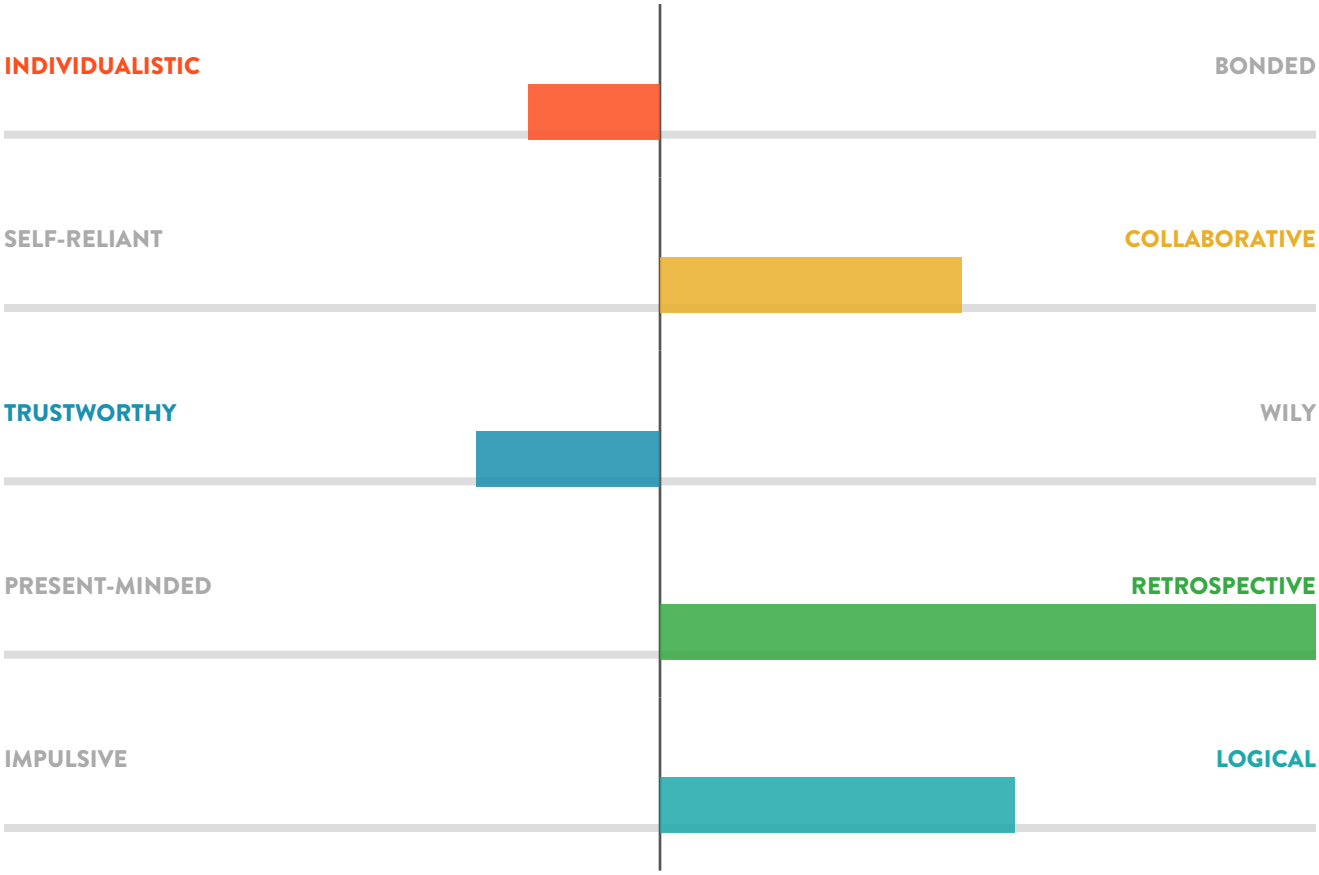
There has recently been a revolution in how we think about intelligence. The Dognition Profile is based on this cutting-edge field called cognitive science. Cognition is the study of how the mind works and draws on many scientific disciplines, from psychology to computer science to neuroscience.

By studying animals, cognitive scientists have made three important discoveries:

> Animals use many types of cognition to survive (learning skills from others, remembering the location of food, inferring the solution to a new problem or deceiving others during competition).
>
> Different animals rely on different cognitive strategies. Asking if a crow is more intelligent than a dolphin is like asking whether a hammer is a better tool than a saw. Each animal has strategies to solve a unique set of problems.
>
> Just because an animal tends to use a certain strategy to solve specific problems doesn't mean he or she will always apply that strategy to all types of problems. Animals rely on a toolbox of strategies that depend on a variety of factors. Dognition gives you insight to the most significant tools that your dog will use on a daily basis to interact with you and the world.

Based on these findings, the Dognition Profile looks at five cognitive dimensions. Rather than counting correct and incorrect answers, the Dognition Profile identifies your dog's cognitive style, and the strategies she relies on to solve a variety of problems. Using this revolutionary new science, the Dognition Profile will give you an unprecedented window into the workings of Moona's mind and reveal her particular genius.

COGNITIVE DIMENSION RESULTS



EMPATHY - Reading and responding to the emotions of others

COMMUNICATION - Using information from others to learn about the environment

CUNNING - Using information from others to avoid detection

MEMORY - Storing past experiences to make future choices

REASONING - Inferring the solution to new problems

EMPATHY

Moona seems individualistic when it comes to the two empathy games you played. Empathy refers to something very specific - the ability to feel what someone else is feeling. It does not measure love, attachment, or any other of the hundred ways that Moona shows her devotion to you.

Being individualistic is something to be proud of. Perhaps you've noticed that Moona is excellent at self-entertaining, or is better at solving problems on her own. However her independence asserts itself, it's all part of Moona's cognitive style.

FIG.1

Playing and interacting with your dog like you did in the Dognition games increases your oxytocin, the hormone responsible for feelings of pleasure, bonding, and affection.

YAWN GAME

In this game, you yawned and recorded whether Moona yawned in response. Yawning in dogs can be an indicator of stress, but we were measuring something different - social yawning. The rationale behind this game is that even as young children, we laugh when we see someone laughing, and we cry when we see someone in distress. Our ability to "catch" the emotions of others is called emotional contagion. A common form of emotional contagion is yawning. If you see, hear or even think about someone yawning, you will probably feel an irresistible urge to yawn.

Moona did not yawn in response to your yawn, but this is not surprising. Although dogs are one of the few species besides humans that contagiously yawn, there is variation among dogs. Data from several research groups shows differing results, but our preliminary data shows that only 20% of dogs yawn contagiously.

EYE CONTACT GAME

This game was based on research that showed that owners whose dogs stared at them for longer periods of time had significant increases in the hormone oxytocin. Oxytocin, also known as the "hug hormone," is related to feelings of bonding, pleasure and affection.

Moona is more wolf-like when it comes to eye contact. Wolves do not seek out the gaze of humans like dogs do. But this doesn't mean that wolves are not bonded to their pack members. They have other ways of connecting. Similarly, not all dogs connect with their owners through eye contact. You know better than anyone how Moona displays her affection for you. But if you are looking for ways to increase oxytocin in a similar way to eye contact, research has shown that hugging and playing with your dog for half an hour raises oxytocin in both you and your dog. You should engage in as many of these play sessions as possible. According to one study, it's more relaxing than reading a book!

Dogs can even be better than aspirin. Children in a hospital reported that their pain was four times less when they played with a dog than when they spent the same time relaxing.

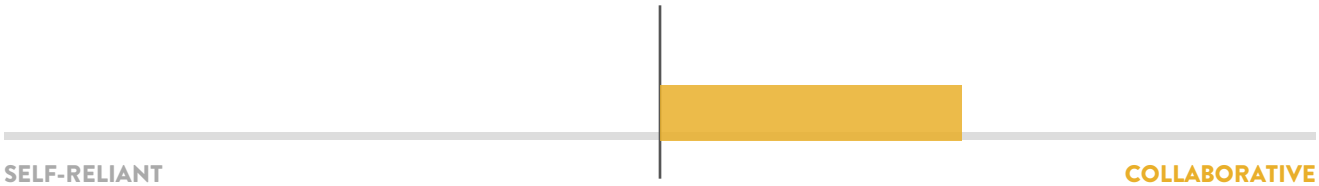
COMMUNICATION

Moona's performance was highly collaborative. You probably notice that Moona can read you like a book. Maybe she seems to know where you are going before you do. Maybe she can tell where to find a lost ball just by you glancing in the right direction. However her talent expresses itself, you can be sure that Moona pays close attention to your gestures and what you are trying to communicate.

Moona is remarkably like a human infant, who start reading communicative gestures at around nine months old. This ability is the foundation for all forms of culture and communication, including language.

Communication is the basis of many relationships, including our relationship with dogs. Moona's behavior in the Communication games demonstrated exactly why the dog and human relationship is so special.

FIG.2



ARM POINTING

Although the pointing game may have seemed simple, the skills it requires are quite specialized. Dogs are one of the only animals that rely on human gestures - but even among dogs there is variation. Some dogs are more like infants and rely heavily on our communicative gestures, while other dogs are more like chimpanzees and try to solve problems on their own without our help. Moona seems to use a mixed strategy. Because Moona could see food in both places, she didn't really need your help, but occasionally chose to follow your gestures anyway.

Did you know that, on average, dogs can start following a human point as young as 6 weeks old?

FOOT POINTING

Just like in the hand pointing game, Moona thought she had better cover all her bases by sometimes choosing the treat you pointed at and sometimes striking out on her own.

Moona probably does not see you point with your foot very often, so this game was a way of seeing how flexibly Moona can read new gestures. Giving animals a new version of a problem they have seen before is a common tactic used to reveal what strategy they are using to solve a problem.

Although Moona did not follow you every time, she may have sensed your communicative intent, and would probably not need much practice to start using a range of new gestures.

Many dogs tend to ignore unintentional cues from humans. The most effective way to communicate is to call the dog's name, make eye contact, then point and look in the direction of the object.

CUNNING

Moona scores as trustworthy in this game since she does not use your social information when deciding whether to take advantage of you. When you put the treat down in front of Moona and said 'No,' you then presented her with different attentional states. In the first condition, you were watching Moona directly. In the second condition you covered your eyes, and in the final condition you turned your back.

A wily dog would have waited until you could not see before they took the treat. In contrast, Moona was more likely to take the treat when you were looking at her than if you had your back turned. This may seem a little audacious, but, in fact, it actually makes her trustworthy because she does not use your social information to deceive you.

This is especially impressive because in the Communication dimension, Moona showed she can easily and flexibly read your gestures. But when given the chance, she won't use this knowledge against you.

FIG.3

When it comes to begging, dogs prefer to be sure you're paying attention. In one study, dogs preferred to beg from a person who was looking at them rather than someone wearing dark sunglasses.

MEMORY

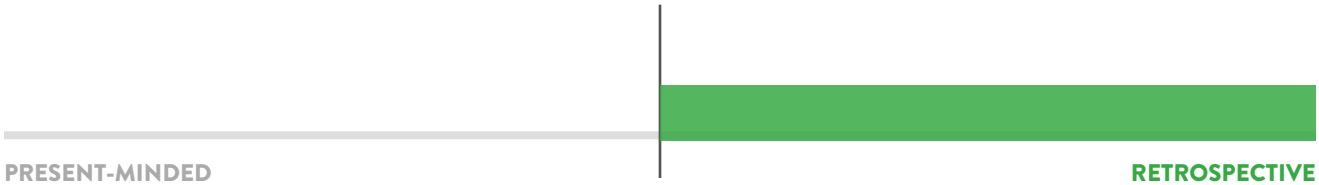
Moona has an amazing working memory, which is a type of memory that allows your dog to keep information in mind for a few minutes and mentally manipulate it. This may sound simple, but working memory is crucial for any kind of problem-solving. In humans, working memory has been found to correlate with skills in learning, math, reading, and language. Researchers have even found some evidence that in children, working memory is more predictive of academic success than IQ.

In these memory games, Moona had to understand that the treat continued to exist, even though it had disappeared from view. In the wild, this ability is essential. Animals have to keep track of mates, predators, and prey that might disappear momentarily behind a bush or a rock.

If Moona is an avid fetch player, you've probably noticed that no stick or ball escapes for long. Moona skillfully searching for an object that has briefly disappeared is a perfect example of her using her working memory to solve a problem.

For Moona, out of sight is definitely not out of mind.

FIG.4



Most dogs can remember their mothers even if they haven't seen them for two years. However, they can't remember their brothers and sisters after a similar separation.

MEMORY VERSUS POINTING

In this game, Moona saw you put the treat under one cup, but point to the other cup. Moona preferred to rely on the information in her working memory rather than what you pointed to. Even though you gave Moona misleading information, she remembered where the treat was and chose to ignore you. This shows an independent thinker; you should be aware that in other situations Moona might not listen to you if she thinks you are wrong.

Despite being genetically similar, dogs and wolves make opposite choices in this game. This difference may be behind why we love dogs so much.

MEMORY VERSUS SMELL

Since dogs have such a keen sense of smell, you may have been surprised that after you switched the cups, Moona used her memory over her sense of smell. She went to where she remembered seeing the treat hidden, rather than sniffing out where the treat was.

One study found that to successfully track a person's direction of travel, tracking dogs need at least five sequential footsteps.

Because a dog's nose can sniff everything from narcotics to cancer, whenever we run a study where we hide a treat under one of two cups, the first question people always ask is, "Can't my dog just smell the food under the cup?" It was certainly our first question, but extensive research by half a dozen independent research groups has concluded that dogs do not rely on their sense of smell to find the food in these games.

If dogs were using smell, they would go directly to the cup with the hidden food. In fact, these studies found that dogs only choose the correct cup around half the time - which means they are guessing. Dogs do have an excellent sense of smell and can probably detect food if allowed to sniff both cups before choosing. But when you study their first choice, they cannot localize the food to a specific cup from a distance of six feet away.

DELAYED CUP GAME

This game was a perfect demonstration of Moona's excellent working memory. After you hid the treat Moona had to retain the information for up to two and a half minutes before making a choice.

This skill comes in handy in the wild. Feral dogs tend to be endurance hunters, slowly wearing down their prey. During the chase, the prey may not always be in direct sight, and feral dogs have to remember where their prey was last seen and predict where they might reappear.

In these kinds of memory games, most cats quickly start to forget where an object is after only 10 seconds, while most dogs are still able to show success for up to 4 minutes.

REASONING

You can be very proud. Moona just aced the most difficult games in the Assessment. Reasoning is the ability to solve a problem when you can't see the answer and have to imagine the solution. Unlike learning through trial and error, which doesn't necessarily require much understanding, reasoning requires that you truly understand the problem and the phenomena behind the problem.

A Sherlock Holmes among dogs, Moona was able to solve the mystery by imagining different solutions and choosing the one that made the most sense. This leads to a lot of flexibility. She can solve a new version of a problem she has seen before, and spontaneously solve new problems she has never seen before. This is a sign of true genius.

FIG.5

Some studies show dogs are better at solving complex puzzles when humans are not around. When humans are around, dogs look to us for help rather than solving it themselves.

INFERENTIAL REASONING GAME

Congratulations - when playing the most difficult game in the most difficult dimension, Moona's performance was masterful. When you showed Moona the empty cup, you were providing indirect information on where the treat was - she had to make an inference that because that cup was empty, the treat must be in the other cup.

This ability to infer by exclusion is problematic for most dogs because they are often confused by conflicting social cues. By lifting up the empty cup, you were actually drawing attention to it, and some dogs prefer to choose this cup even though it was empty. The fact that Moona was able to control this impulse shows an impressive ability to make inferences.

What is even more impressive is that Moona was so collaborative in the Communication dimension. It seems that Moona knows exactly when to use your gestures to make decisions and when to make decisions on her own.

Ravens and crows have been shown to have incredible reasoning abilities that surpass dogs, and even rival some human children. But when it comes to being our best friends, dogs still take the cup.

PHYSICAL REASONING GAME

Moona did seem to understand the principle of solidity - that one solid object cannot pass through another - at least some of the time.

Although this might have seemed like a simple game, it was actually quite complicated. First, Moona had to infer that you hid a treat (since Moona didn't actually see you hide it). Then she had to understand enough of the physical world to infer that a piece of paper at an angle indicated that the treat was hidden behind it. It is impressive that Moona figured out the answer as often as she did.

By no means did Moona do badly on this game; in fact, she developed quite a clever strategy. She developed a right or left side bias, meaning when she didn't know which side was correct, she went to one side every time. This is pretty clever, because 50% of the time she was correct.

Even though many dogs may struggle with physical properties like gravity, this doesn't stop them from thoroughly enjoying a game of fetch.

NEXT STEPS

We hope you've enjoyed reading Moona's Dognition Profile and gaining fresh perspective on how she sees the world!

You can fill your friends in on what you've discovered about Moona very easily. Download and email or print Moona's profile report any time from your portal.

Of course, these five cognitive dimensions are only part of the picture; the magic of your relationship with Moona is how you spend your time together. To that end, a Dognition membership gives you on-going games and tips that will help provide even more insight into what makes Moona tick and how to act on that information.

As a member, each month you'll receive:

- A new game that will shed light on another aspect of how Moona thinks and sees the world.

- Tips and activities prepared for Moona from canine training experts based on how Moona sees the world.

- Exclusive offers from Dognition partners, including brands such as Kong and Purina ONE.

- New findings about how all dogs think and how Moona's strategies compare.

At the same time, by contributing to Dognition you and Moona are helping to build the world's knowledge about all dogs. This allows us to tackle fresh questions -- how do certain breeds think compared to others? To what extent do memory skills decline by age? Are female dogs any more empathic than male dogs? And many more!

What questions would you like answered? We'd love any feedback on that or anything else related to Dognition. Contact us any time at hello@dognition.com.

Woof!

The Dognition Team

See the World Through Your Dog's Eyes

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