



# KELLY

DOGNITION REPORT - APRIL 28, 2019



## **A SMOOTH OPERATOR, THE CHARMER RELIES ON HER SECRET WEAPON - YOU.**

Kelly can work a problem out on her own as well as anybody, but she prefers to rely on her secret weapon - you. As a Charmer, Kelly has exceptional social skills, which means she can read your body language like a book. She is not above using this information to get her own way. Kelly is no fool when it comes to independent problem solving, and her scores reflect a keen understanding of the physical world. However, Kelly's real genius is that she sees you as an ally and partner, and she will usually turn to you for help before trying to figure out a problem 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:*

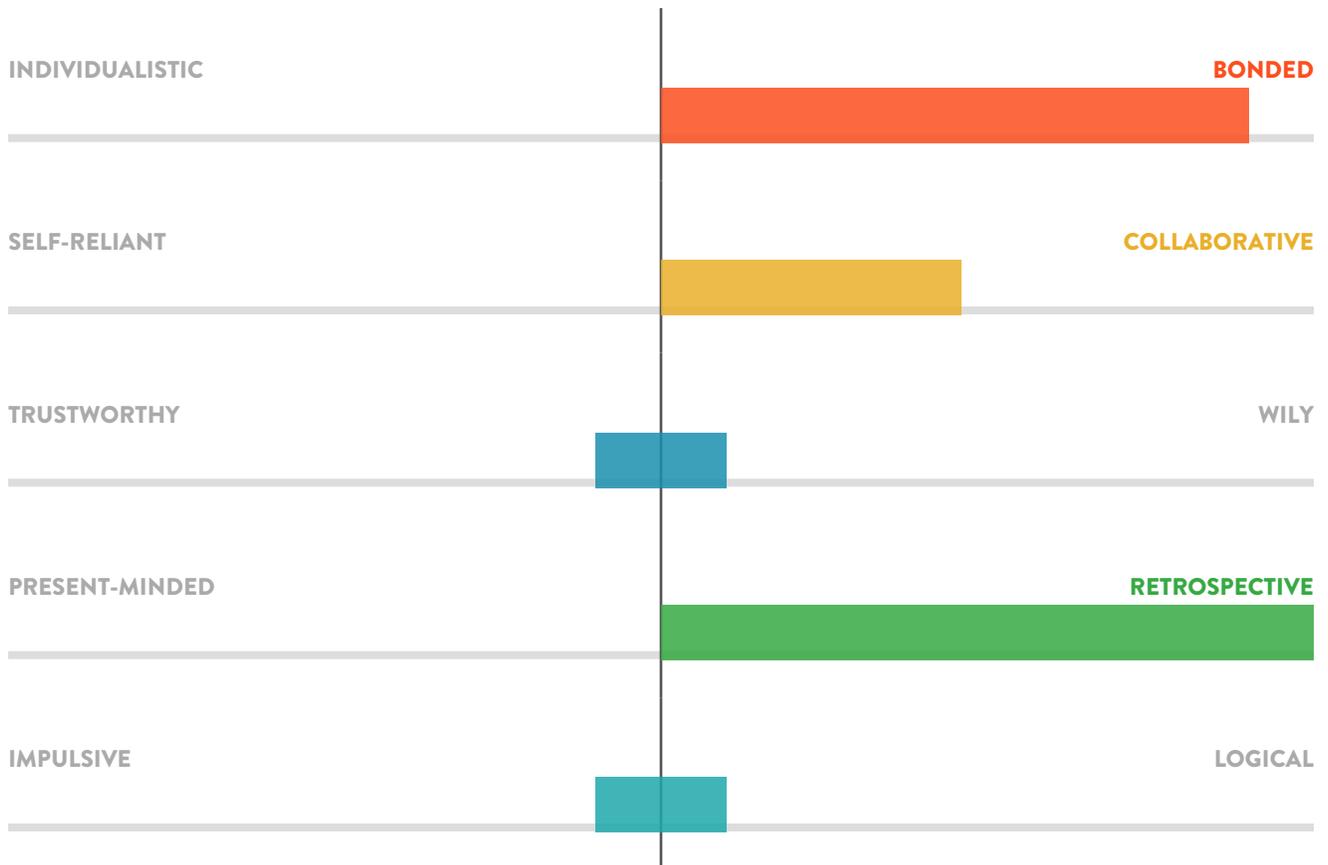
Animals use many types of cognition to survive (learning skills from others, remembering the location of food, inferring the solution to a new problem or deceiving others during competition).

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 Kelly'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

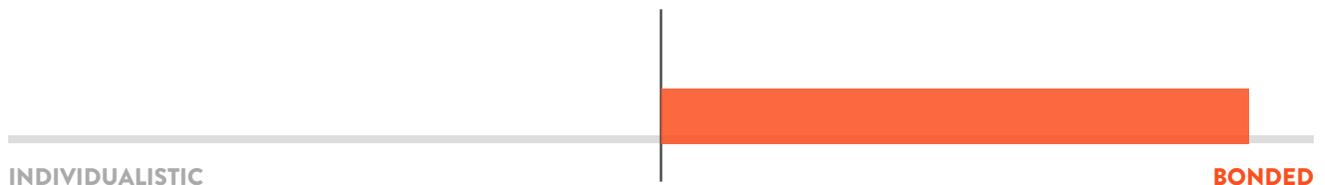
# EMPATHY

Kelly's empathy scores were off the charts. Empathy is the ability to feel what someone else is feeling. Humans are extremely empathetic; it is one of our best qualities. Empathy is not something we are taught; it is present even in young children, growing and strengthening as we get older.

Researchers have recently suggested that other animals also have empathy, or at least a basic form of empathy. If this is true, dogs are an ideal place to look. Humans and dogs go back thousands of years - enough time for the bond between us to develop into something special.

This is even more special because initial results suggest that small dogs like Kelly tend to be more individualistic than large dogs. By being more on the bonded end of the scale, Kelly certainly stands out from the small dog crowd. If most dogs are bonded to their owners, Kelly absolutely adores you.

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

It is quite impressive that, during a limited amount of time, Kelly yawned when you yawned. Humans 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. Contagious yawning is related to empathy scores in adults.

If Kelly could take a human empathy test, she would probably score quite high! So far, only a few species besides humans have been shown to contagiously yawn. Although dogs may yawn when they are stressed, they also yawn socially. Contagious yawning has been seen in dogs, but not all dogs yawn. It looks like Kelly is one of the empathetic ones.

Recent studies have shown that dogs only catch yawns from humans, not other dogs.



## EYE CONTACT GAME

In this game, you timed how long Kelly held your eye contact. Before babies can hug or speak, they use eye gaze to bond with their mothers. Research with dogs has shown that a similar phenomenon may happen with owners and dogs. Owners whose dogs stared at them for longer had significant increases in the hormone oxytocin. Oxytocin, also known as the "hug hormone," is related to feelings of bonding, pleasure and affection.

Judging by the extraordinary length of time Kelly spent gazing soulfully into your eyes, you probably often find her staring at you for no reason. You might wonder if Kelly is trying to tell you something, like she is hungry, needs to go to the bathroom or has an opinion on what to do over the weekend. But Kelly may not want or need anything - she may be just hugging you with her eyes.

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.



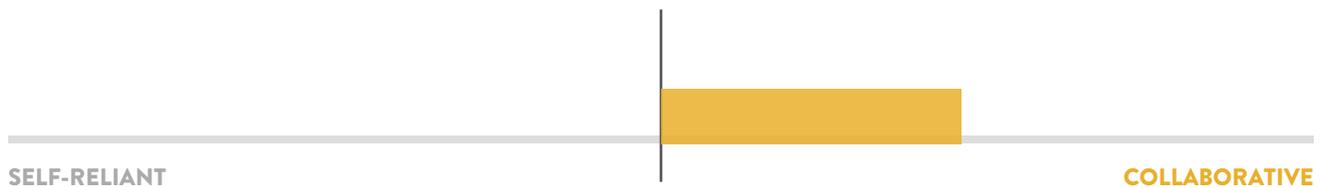
# COMMUNICATION

Kelly's performance was highly collaborative. You probably notice that Kelly 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 Kelly pays close attention to your gestures and what you are trying to communicate.

Kelly 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. Kelly's behavior in the Communication games demonstrated exactly why the dog and human relationship is so special.

FIG.2



## ARM POINTING

You probably don't take much notice when Kelly effortlessly uses your pointing gesture in all sorts of situations, from finding a toy to figuring out which direction to go next. But this is a remarkable skill. Kelly did so well in this game that her skills are similar to those of a human infant. At around nine months old, infants begin paying attention to what people are trying to communicate when they point. Infants also begin pointing things out to people. Whether infants point to their favorite toy or watch you point to a bird, they are beginning to build core communication skills. Just like an infant, Kelly relies on your communicative gestures to solve all sorts of problems she probably could not solve alone.

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



## FOOT POINTING

Although Kelly followed you almost every time when you pointed with your hand, when you pointed with your foot Kelly did not seem as sure.

Kelly probably does not see you point with your foot very often, so this game was a way of seeing how flexibly Kelly 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 Kelly 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. Especially since she was such an expert in the hand pointing game.

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.



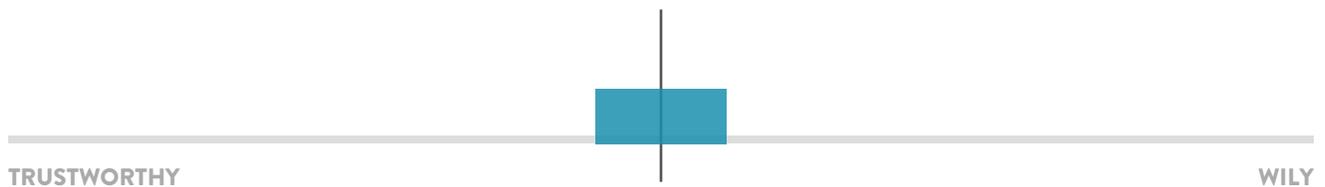
# CUNNING

In the Cunning games, you placed a treat in front of Kelly and let her know not to take the treat. You then showed Kelly three different attentional states -- watching, turning your back, and covering your eyes.

In order to be at either end of this cognitive dimension, trustworthy or wily, Kelly must show that she can tell when you are looking, and use this information when deciding when to go for the treat. In this case, Kelly's decision did not change no matter which attentional state you presented; she waited roughly the same amount of time in each trial.

This doesn't mean that Kelly can't be trusted, it just shows us that there are other internal factors influencing Kelly's decision.

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

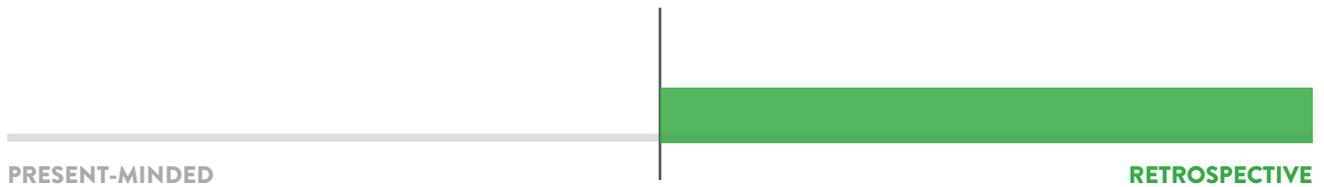
Kelly has an amazing working memory, which is a type of memory that allows your dog to keep information in mind for a few minutes and mentally manipulate it. This may sound simple, but working memory is crucial for any kind of problem-solving. In humans, working memory has been found to correlate with 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, Kelly 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 Kelly is an avid fetch player, you've probably noticed that no stick or ball escapes for long. Kelly skillfully searching for an object that has briefly disappeared is a perfect example of her using her working memory to solve a problem.

For Kelly, 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, Kelly saw you put the treat under one cup, but point to the other cup. Kelly preferred to rely on the information in her working memory rather than what you pointed to. Even though you gave Kelly 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 Kelly 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, Kelly 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.

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.

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



## DELAYED CUP GAME

Working memory is critical for animals that are endurance hunters such as wolves or feral dogs. Endurance hunters chase after prey for long periods of time, slowly wearing them out. During long chases the prey may not always be in direct sight, so the hunter has to remember where its prey was last seen.

Just like her ancestors, Kelly had to remember the location of the target for different amounts of time. Although the modern world has many distractions, it looks like Kelly still did pretty well, using her working memory to find the treat most of the time. This is no easy feat, as even you may have forgotten where the treat was during the longer delays.

By no means did Kelly 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.

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.



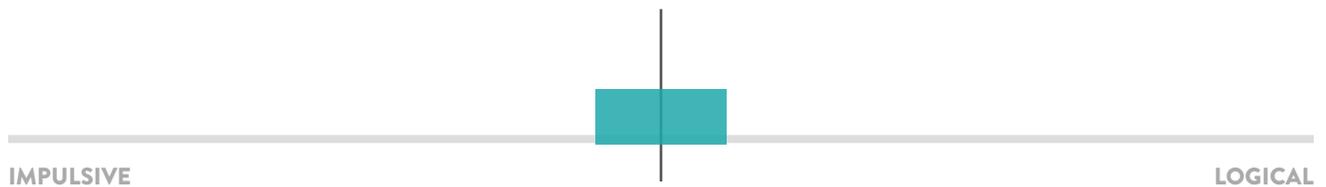
# REASONING

Kelly is the kind of dog that likes to see all the pieces before she solves the puzzle. Reasoning is the ability to solve a problem when you can't see the answer and have to imagine the solution.

Kelly scored more towards the impulsive end, which means she doesn't get caught up in the details - especially details that aren't right in front of her. There is no shame in this. The reasoning games are the most difficult in the Assessment and most dogs find them extremely challenging.

From Kelly's performance in the Communication dimension, she relies on you for help when making decisions. She obviously sees you as her best bet when solving a problem.

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.



## INFERENCE REASONING GAME

In this game, you presented Kelly with a problem and provided some, but not all of the information needed to solve it. When you showed Kelly the empty cup she had to infer that the treat must be in the other cup.

This is not as easy as it sounds because Kelly was also attracted to the empty cup, for the simple reason that you touched it. It looks like Kelly switched back and forth between strategies in this game, sometimes making an inference and choosing the correct cup, and sometimes relying on your social cues. Either way, this shows impressive flexibility.

Kelly is quite the clever dog! Once again, when faced with a difficult decision during this game she consistently chose one side. Kudos to her for developing this unique strategy.

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

Kelly 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, Kelly had to infer that you hid a treat (since Kelly 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 Kelly figured out the answer as often as she did.

Kelly is quite the clever dog! Once again, when faced with a difficult decision during this game she consistently chose one side. Kudos to her for developing this unique strategy.

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 Kelly'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 Kelly very easily. Download and email or print Kelly'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 Kelly 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 Kelly 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 Kelly thinks and sees the world.
- Tips and activities prepared for Kelly from canine training experts based on how Kelly 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 Kelly's strategies compare.

At the same time, by contributing to Dognition you and Kelly 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](mailto:hello@dognition.com).

Woof!

The Dognition Team



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