



# MAGGIE

DOGNITION REPORT • MARCH 16TH, 2013



## GOOD AT A LITTLE BIT OF EVERYTHING

In a world of helicopter parents and the relentless pursuit of perfection, it is easy to discount the value of a steady performance. Maggie is a Renaissance Dog, which means she is good at a little bit of everything. Although her performance in the different games may vary, overall Maggie showed accomplished social skills and solid independent problem solving. Rather than being a specialist with a single expertise, Maggie is a generalist. While others focus on the proverbial tree, Maggie can see the entire forest.



# 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:*

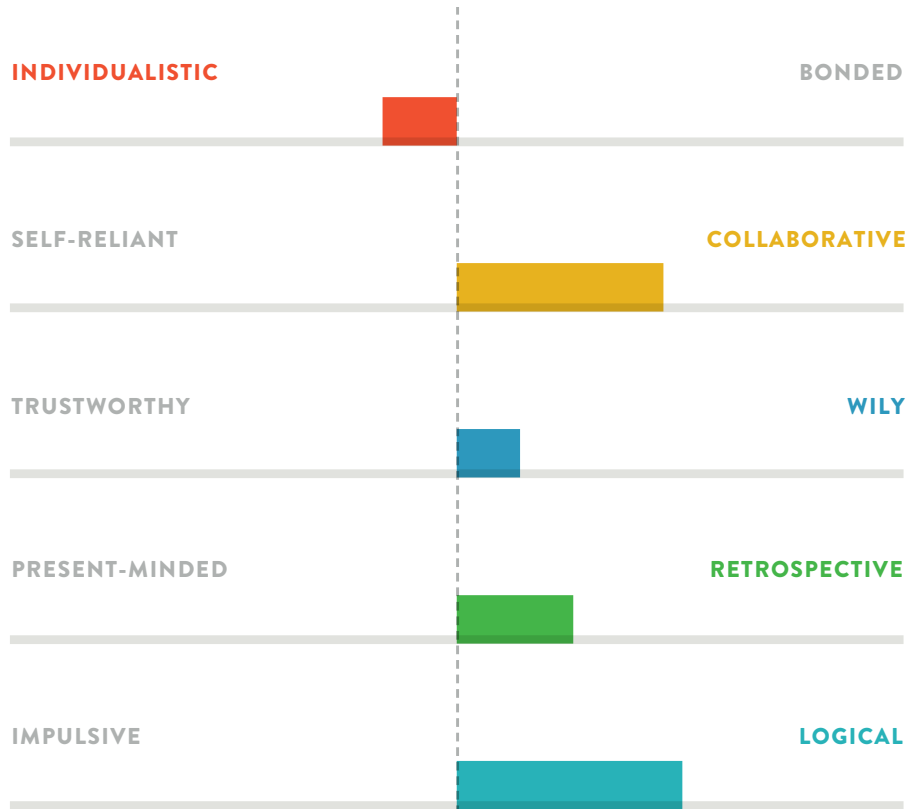
Animals use many types of cognition to survive (learning skills from others, remembering the location of food, inferring the solution to a new problem or deceiving others during competition).

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 Maggie's mind and reveal her particular genius.

# COGNITIVE DIMENSIONS



**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

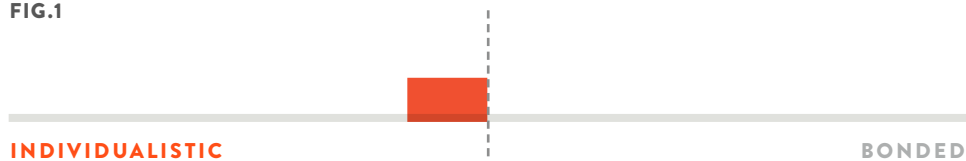
# EMPATHY

Empathy is the ability to feel what someone else is feeling. Humans are extremely empathetic.

Researchers have recently suggested that many animals, including dogs, have at least a basic form of empathy. Dogs may have developed this quality because of their special relationship with us.

Maggie seems more individualistic, or wolf-like, when it comes to the two empathy games you played. She may just have another way of connecting with you. However, this doesn't mean Maggie is not attached to you. Wolves have strong relationships within their pack.

FIG.1



## YAWN GAME



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.

Even though Maggie didn't yawn during the game, it doesn't mean she is not empathetic. It could be that if you waited longer, she would have yawned.

Perhaps in the past you have seen her yawn when you yawned. However, to compare Maggie to other dogs, all dogs have to play the game the same way.

Other contagious emotions include laughing, crying, smiling, and frowning. How does Maggie react when you laugh?

## EYE CONTACT GAME



In this game, you timed how long Maggie 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 also be happening with owners and dogs. Owners whose dogs stared at them for longer periods 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 Maggie spent gazing soulfully into your eyes, you probably often find her staring at you for no reason. You might wonder if Maggie is trying to tell you something, like she is hungry, needs to go to the bathroom or wants to weigh in on an interesting issue you’ve both just seen on television. But Maggie may not want or need anything — she may just be seeking your gaze in order to hug you with her eyes.

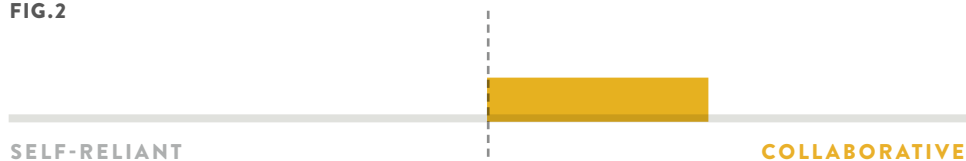
Recently, therapy dog programs have utilized the dog-human relationship for health benefits. One study found that children in a hospital who played with a therapy dog reported pain that was four times less than children who spent the same time relaxing.

# COMMUNICATION

Communication is the foundation of many relationships, including our relationship with dogs. It's easy to take for granted that Maggie can read you like a book, but this ability is rare in the animal kingdom. Of all the species that have been studied, dogs are the champions at using our communicative gestures. Even chimpanzees, who are one of our closest living relatives, do not rely on human gestures as much as dogs do. Instead, chimpanzees try to figure out problems on their own. Dogs are more like human infants who start using gestures as they begin learning language.

Maggie's performance is highly collaborative. It looks like she relies on an infant-like strategy that allows her to flexibly use human gestures to solve all types of problems.

FIG.2



Although many apes can be trained to communicate with humans, the fact that dogs do it without training is one of the things that makes dogs so amazing.

## 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. Maggie seems to use a mixed strategy. Because Maggie could see food in both places, she didn't really need your help, but occasionally chose to follow your gestures anyway.

**Did you know? Dogs can start following a human point when they are as young as 6 weeks old.**

## FOOT POINTING



This game tested your dog's flexibility. You probably don't usually point things out with your foot, so this was one way to see if Maggie could read a gesture she has seen infrequently or not at all. Giving Maggie a new version of a problem she has seen before is a good way to see what strategy she is using. If Maggie is good at solving a problem but can't solve a new version, then she probably learned to solve the original problem through lots of practice, without necessarily understanding much about the problem in the first place. If Maggie can also solve the new problem, then she probably understands enough to spontaneously solve a range of related problems. Maggie's skillful use of your foot pointing suggests she has a flexible understanding of the communicative nature of human gestures.

**Some dogs can use a variety of different gestures to find food, including when we 'point' with our eyes or head.**

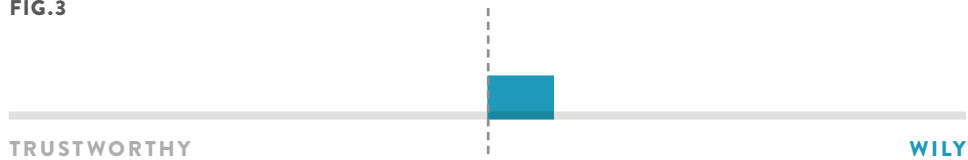




# CUNNING

A dog that effectively uses cognitive strategies can occasionally be too wily to obey us. Even though dogs usually use our gestures to cooperate with us, they are not above using social information to get their own way. The cunning games are based on research showing that many dogs use information about what you can and can't see when deciding how to behave — or, in some cases, misbehave.

FIG.3



Maggie is the perfect example of a dog using cognitive strategies effectively. She knew she should wait when you were watching, and that it was safe to swoop in and take the treat when you had your back turned or your eyes covered.

The fact that Maggie didn't wait as long to take the treat when your eyes were covered is impressive, since you looked almost exactly the same as when you were watching Maggie — the only difference was that you had your hands over your eyes. Many animals can tell the difference between your front and back, but even some primates (e.g. lemurs) have difficulty detecting the subtle meaning of covering your eyes. Maggie's performance shows a sophisticated mind at work.





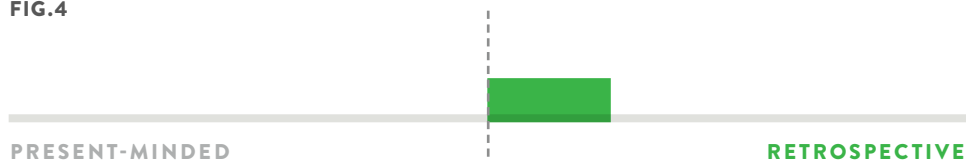
Interestingly, although chimpanzees would not do so well in the Communication dimension where gestures are cooperative, they do very well in games where they have to compete with or deceive a human. In fact, just like Maggie, they can tell what you can or can't see, using this social information for their own ends.

Dogs seem to be incredibly sensitive to what we can and cannot see. In one study, dogs preferred to beg from a person who had their eyes open as opposed to someone wearing a blindfold or sunglasses.

## MEMORY

Maggie has an amazing working memory. This kind of memory allows her 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 to learning, math, reading, and language. Researchers have even found that in children, working memory is more predictive of academic success than IQ.

FIG.4



In these memory games, Maggie 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 rock.

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

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

**Dogs can use their impressive memories to learn hundreds of words. One famous border collie named Chaser learned over a thousand!**

## MEMORY VS. POINTING



In this game your dog saw you put the treat under one cup, but point to the other cup. Maggie was clearly trying hard to figure this one out. She wanted to use the information you were giving her, but she also knew what she saw. Rather than choose one strategy, she switched back and forth between the two, which shows impressive flexibility.

## MEMORY VS. SMELL



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 before they had inspected both cups. Dogs only choose the correct cup around half the time — which means they are guessing. Although dogs have an

excellent sense of smell and can probably detect food in the vicinity, they cannot localize the food to a specific cup.

Although Maggie did occasionally go to where the treat was hidden, rather than where you showed her you hid the treat, it is unlikely Maggie could smell the food. If Maggie relied on smell alone she would have found it each time.

**Did you know? The olfactory center of a dog's brain is 40 times bigger than a human's.**

## DELAYED CUP GAME



Working memory, a type of short term memory, is critical for animals that are endurance hunters such as wolves. Endurance hunters chase after prey for long periods of time, slowly wearing them out. During that long chase the prey may not always be in direct sight, so the wolf would have to remember where its prey was last seen. Behind that bush, over the hill, or even under a cup! Dogs have retained remnants of this working memory, and many are able to remember the location of multiple objects for minutes at a time.

In this game, your dog had to store the location of the food in her short term memory for different amounts of time. It looks like Maggie retained that excellent working memory from generations ago and was pretty much perfect.

**In a similar memory game, dogs remembered where food was hidden four times longer than cats. In these kinds of memory games, cats quickly start to forget where an object is after only 10 seconds, while dogs still show some success for up to 4 minutes.**

# REASONING

Maggie used an impressive amount of logic in the Reasoning dimension. Reasoning is the ability to flexibly solve a new problem when the answer is not obvious.

In the real world, there is not always time to slowly figure out a solution through trial and error. Imagine speeding down the road and seeing the brake lights of several cars in front of you. You will probably (and rightly) conclude that there is an obstacle in front of those cars that you can't see yet — perhaps a traffic light or even an accident. Waiting for the answer to become clear could mean the difference between life and death. That is why we and many other animals need to make inferences — fast.

The games in the Reasoning dimension are very advanced; even five-year-old children can struggle with them. Ravens, on the other hand, excel at inferential reasoning. Known for their advanced cognitive abilities, ravens frequently use logic to solve problems like these. Like a clever raven, even when Maggie couldn't see the correct solution, she could imagine different solutions and choose among them. This leads to a lot of flexibility. She can solve a new version of a familiar problem, as well as spontaneously solving new problems she has never seen before.

FIG.5



Highly intelligent species like ravens have incredible reasoning abilities. They craft complex tools and solve very tricky puzzles — Maggie also has impressive reasoning abilities.

## INFERENCE REASONING GAME



This was probably the most difficult game, so congratulations to you and Maggie for making it through. When you showed Maggie the empty cup, she had to make an inference that because that cup was empty, the treat must be in the other cup.

This is not as easy as it sounds, because dogs usually prefer to choose the last object that you touched, which was the empty cup. It looks like Maggie was switching between two strategies — she may have figured out the problem, but she was also relying on your social cues.

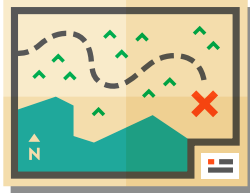
Another reasoning ability that dogs seem to have is the principle of solidity, or that one object can't pass through another. Your dog probably understands that you can't throw her tennis ball through a wall, for example.

## PHYSICAL REASONING GAME



Although this might seem like a simple game, it is actually quite complicated. First, Maggie had to infer that you hid a treat (since Maggie didn't actually see you hide it). Then she had to understand enough of the physical world to infer that a piece of paper on an angle indicates that the treat is hidden behind it. The fact that Maggie was able to solve this problem is very impressive.

## NEXT STEPS



We hope you've enjoyed reading Maggie's Dognition Profile and gaining perspective on how she sees the world! Remember, these five dimensions and nine cognitive styles are only part of the picture; the magic of your relationship with Maggie goes beyond science.

*You can easily share Maggie's Profile snapshot, letting your friends find out what you've learned about her!*



An ongoing membership in Dognition is a great way to continue learning about and encouraging your furry friend.

You'll have a personal Dognition portal, containing new games and feedback each month based on Maggie's profile (collect all 12 in a year-long membership!). You'll be able to view your completed Dognition Profiles, as well as all badges earned from Dognition games.

Moving forward, your portal will include tips and activities prepared for Maggie from canine training experts, exclusive offers from Dognition Partners, and new findings about how all dogs think and how Maggie's strategies compare.

Go to [www.dognition.com](http://www.dognition.com) today to purchase a membership. And thanks again for helping us help dogs.

*Woof!*

**The Dognition Team**



Dognition™

Find the genius in your dog.