Everybody loves a Maverick. This is the one who strikes out alone and doesn’t conform to anyone’s standards. Twinkie / The Amazing Twinkie definitely prefers to tackle problems independently. When it comes to understanding the physical world, she can hold her own compared to other dogs. In terms of social skills, Twinkie / The Amazing Twinkie puts the “wolf” back in “lone wolf.” This specific performance in the range of games testing social skills was definitely more wolf-like than most dogs. But this cheeky wolfishness is part of Twinkie / The Amazing Twinkie’s appeal.
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 Twinkie / The Amazing Twinkie's mind and reveal her particular genius.
COGNITIVE DIMENSION RESULTS

INDIVIDUALISTIC

SELF-RELIANT

TRUSTWORTHY

PRESENT-MINDED

IMPULSIVE

BONDED

COLLABORATIVE

WILY

RETROSPECTIVE

LOGICAL

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
Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie shows her devotion to you.

You may be interested to know: initial results seem to suggest that small dogs like Twinkie / The Amazing Twinkie are generally more individualistic than large dogs.

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

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

**YAWN GAME**

In this game, you yawned and recorded whether Twinkie / The Amazing Twinkie 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.

Twinkie / The Amazing Twinkie 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.

Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie 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!
COMMUNICATION

Communication is the foundation of many relationships, including our relationship with dogs. It’s easy to take for granted that our dogs seem to read us 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 these types of problems on their own. Dogs are more like human infants who start using gestures as they begin learning language.

It looks like Twinkie / The Amazing Twinkie tended to switch back and forth between collaborative and self-reliant strategies. Sometimes she followed your communicative gestures, but sometimes she chose to ignore them. This could be because Twinkie / The Amazing Twinkie either struggles to read your cues, or because there was a treat in both places and Twinkie / The Amazing Twinkie didn’t feel the need to look to you for help.

FIG.2

SELF-RELIANT

COLLABORATIVE

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. Twinkie / The Amazing Twinkie seems to use a mixed strategy. Because Twinkie / The Amazing Twinkie could see food in both places, she didn’t really need your help, but occasionally chose to follow your gestures anyway.

By no means did Twinkie / The Amazing Twinkie 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.
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.

Twinkie / The Amazing Twinkie is more comfortable following your hand point than your foot point. Since you probably do not usually point with your foot, this game was simply testing how flexibly Twinkie / The Amazing Twinkie uses your communicative gestures.

Twinkie / The Amazing Twinkie did occasionally follow you when you pointed with your hand, so we were interested in seeing whether she could use this skill in a new context with a new gesture. Although Twinkie / The Amazing Twinkie used a mixed strategy in hand pointing, she seems to prefer that gesture to one she may find a bit bizarre.
In the Cunning games, you placed a treat in front of Twinkie / The Amazing Twinkie and let her know not to take the treat. You then showed Twinkie / The Amazing Twinkie 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, Twinkie / The Amazing Twinkie 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, Twinkie / The Amazing Twinkie'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 Twinkie / The Amazing Twinkie can't be trusted, it just shows us that there are other internal factors influencing Twinkie / The Amazing Twinkie's decision.

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

For Twinkie / The Amazing Twinkie, out of sight is definitely not out of mind.

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, Twinkie / The Amazing Twinkie saw you put the treat under one cup, but point to the other cup. Twinkie / The Amazing Twinkie preferred to rely on the information in her working memory rather than what you pointed to. Even though you gave Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie might not listen to you if she thinks you are wrong.

MEMORY VERSUS SMELL

Since dogs have such a keen sense of smell, you may have been surprised that after you switched the cups, Twinkie / The Amazing Twinkie 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.
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.

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 that long chase the prey may not always be in direct sight, so the hunter would have to remember where its prey was last seen.

Just like her ancestors, Twinkie / The Amazing Twinkie had to remember the location of the target for different amounts of time. Although the modern world has many distractions, it looks like Twinkie / The Amazing Twinkie did perfectly on delays up to 1 minute and 30 seconds. However, when faced with a delay of 2 minutes and longer, Twinkie / The Amazing Twinkie had a little more trouble remembering. There is no shame in this, since during the longer delays you probably also had trouble remembering the location of the treat.
REASONING

Twinkie / The Amazing Twinkie shows solid reasoning skills in one or both of the games. This is impressive, since the games in this dimension were the most difficult of the Assessment. Reasoning is the ability to solve a problem when you can't see the answer and have to imagine the solution.

Twinkie / The Amazing Twinkie was somewhere in between logical and impulsive. It seems that sometimes she uses her powers of deduction, but sometimes she prefers to make decisions on the fly.

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

In this game, you presented Twinkie / The Amazing Twinkie with a problem and provided some, but not all of the information needed to solve it. When you showed Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie was also attracted to the empty cup, for the simple reason that you touched it. It looks like Twinkie / The Amazing Twinkie 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.

Twinkie / The Amazing Twinkie 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.

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

Twinkie / The Amazing Twinkie 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.
NEXT STEPS

We hope you've enjoyed reading Twinkie / The Amazing Twinkie'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 Twinkie / The Amazing Twinkie very easily. Download and email or print Twinkie / The Amazing Twinkie'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 Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie thinks and sees the world.

- Tips and activities prepared for Twinkie / The Amazing Twinkie from canine training experts based on how Twinkie / The Amazing Twinkie 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 Twinkie / The Amazing Twinkie's strategies compare.

At the same time, by contributing to Dognition you and Twinkie / The Amazing Twinkie 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
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