# What Causes the "Guilty Look" in Dogs?

*by*

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## Part I – Introduction

If you've ever been to a dog park, you'll know it's not just for the dogs. Owners discuss and debate their dogs' behaviors, disagreeing about which breeds are more likely to nip at visitors' heels (Corgis? Chihuahuas? Dachshunds?), chase real or imaginary squirrels (Airedale Terriers? Jack Russell Terriers? Border Collies?), or drool the most (Newfoundlands, Saint Bernards, Bassett Hounds, and Mastiffs all compete for the title). Owners also can have quite heated arguments about their dogs' possible emotional experiences, and one quite controversial emotion is *guilt*.

A few years ago at a dog park in New York City, a group of dog-owners were chatting while they watched their dogs play. After throwing a ball for her dog, Mrs. Sanchez turned to the group and said, "You know, whenever I come home and Taco has done something naughty, like getting into the trash, he looks so guilty!" Mr. Liu, who considered himself to be something of a dog expert, shook his head. "Mrs. Sanchez, I think you are anthropomorphizing; you are attributing human emotions and characteristics to Taco, but we don't know if he actually *feels* guilty, do we? We don't know if Taco *knows* he did something wrong or what *caused* him to look guilty." Although Mrs. Sanchez looked annoyed, Mr. Liu bravely continued, "Guilt is a secondary emotion like jealousy or love, so it is more complex than a simple, primary emotion like happiness or fear. Dogs probably do feel happiness and fear, but it isn't known whether they also can feel guilty." Mr. Williams overheard the conversation, and said, "But my Daisy does the same thing! If I come home and she's had an accident on the carpet, she definitely has a guilty look." Then someone else chimed in, "Same here!" More and more dog owners agreed. Mr. Liu began to feel a little uncomfortable (after all, he wasn't really a dog expert). "But I've read books by Dr. Alexandra Horowitz," he said. "She's a dog expert who works right here in New York City!"

Dr. Alexandra Horowitz is indeed an expert in the field of canine behavioral research. She is an Associate Professor at Barnard College, Columbia University in New York City, where she runs the Horowitz Dog Cognition Lab. Alex conducts experiments on various aspects of dog behavior and she has published several popular science books about dogs, including *Inside of a Dog—What Dogs See, Smell, and Know*; *Being a Dog—Following the Dog into a World of Smell*; and most recently, *Our Dogs, Ourselves—The Story of a Singular Bond*. She has also edited a more scholarly book for behavioral scientists called *Domestic Dog Cognition and Behavior—The Scientific Study of Canis [lupus] familiaris*. Needless to say, Dr. Horowitz knows dogs!

Alexandra Horowitz has also carried out an experiment on what might cause the "guilty look" in dogs. Her results are included in the article, "Disambiguating the 'guilty look': Salient prompts to a familiar dog behaviour," published in the journal *Behavioural Processes* in 2009.

## Questions

1. Can you think of other examples of anthropomorphism? List them, and try to include at least one non-canine example from another animal.

2. Do you own a dog and has it ever misbehaved? What did it do and did it look "guilty"?

3. Brainstorm guilty looks in humans and list them. Then watch the "guilty dog" clips below on YouTube and create a list of what makes them look guilty (these are the behaviors you might plan to observe and record in dogs when you design an experiment examining the "guilty look"). Are all of the behaviors "guilty looks" in your opinion?
   • "Denver the Guilty Dog": <https://youtu.be/B8ISzf2pryI> (Running time: 2:18 min)
   • "Hilarious Guilty Dogs Compilation 2016": <https://youtu.be/ltCQJkz8UkE> (Running time: 4:53 min)

4. What experiences could a dog have that might cause the appearance of guilt?
   a. Consider the dog's behavior before the owner arrives home and the owner's behavior when they arrive home. Think back to the owners' behaviors in the video clips as well as your own experiences to develop experimental hypotheses about what might cause the "guilty look."

   b. Suggest what experimental conditions you might need to test these hypotheses.

## Part II – Author's Hypotheses and Methods

Alexandra Horowitz has dogs of her own, so it's conceivable that she came up with the hypotheses for her "guilty dog" experiment based on personal experience. Perhaps she came home after work one day, and discovered that one of her dogs (let's call him "Barney") had gotten into the garbage can in the kitchen yet again and there was garbage everywhere. Possibly, she scolded Barney as she may have done before. If so, she likely would have to admit, Barney did look pretty guilty. Hmm…there seem to be two potential explanations here:

> *Hypothesis 1:* Dogs look guilty in response to their owner's behavior when they return home.

> *Hypothesis 2:* Dogs look guilty due to remembering their own bad behavior, which occurred prior to their owner returning home. (This is perhaps the explanation that most dog park owners would support.)

Alexandra's assistants put up flyers in dog parks to recruit owners of dogs that were at least six months of age and that had lived with their owners for at least three months. She successfully recruited several dog owners, all of whom lived in nearby apartments in New York City. All owners were required to own just one dog (having another dog around would have been a distraction during the experiment). Of course we don't know exactly what happened during the experimental trials, but let's imagine that Alexandra first went to Mrs. Sanchez's apartment and rang the doorbell. Mrs. Sanchez's disembodied voice could be heard on the intercom, which had a surveillance camera. "Oh good, it's Dr. Horowitz!" Mrs. Sanchez exclaimed as she pressed the buzzer to unlock the front door downstairs. "Taco is so excited to meet you!" (However, Taco the rescue corgi probably nipped Alexandra on the ankle when she first arrived.)

Alexandra would have explained the experiment and received Mrs. Sanchez's consent to be filmed. Prior to the start of the experiment, Mrs. Sanchez was told to first show Taco a treat on the floor, to say *"No!"* in a firm tone, tell him to sit and stay, and then to wait for ten seconds. Ten seconds later, Taco was still sitting and the treat was still on the floor. He had passed the first test! Now he could participate in the actual experiment. Out of all the dogs recruited, only 14 dogs met this important criterion (which is perhaps not too surprising, given the temptation of the treat). This criterion ensured that the dog had understood the commands given to it and was able to obey those commands for at least a brief period of time.

The experiment followed the same basic procedure as above, except the video camera was turned on and Mrs. Sanchez left the room for each trial. Mrs. Sanchez told Taco to sit, put the treat on the floor, pointed at the treat, said *"No!"*, and left the room for 20 seconds. But this time, when Mrs. Sanchez returned, the treat was no longer present. She was told that Taco had eaten the treat (actually, he had *not* eaten it, Alexandra had just put it in her pocket) and was told to scold Taco in her usual manner. This process was repeated three more times, but with minor variations. Once, Taco really did eat the treat (Alexandra gave it to him, but told Mrs. Sanchez he had stolen it), so Mrs. Sanchez scolded him. Once, Taco again ate the treat (because Alexandra secretly gave him the treat), but this time he wasn't scolded; instead, Mrs. Sanchez greeted him with praise (because Alexandra replaced the treat just before Mrs. Sanchez returned). And once, Taco really didn't eat the treat, and so he wasn't scolded, but was greeted with praise by Mrs. Sanchez. There was also a control trial both before and after the experimental trials. In these control trials, Mrs. Sanchez put a treat on the floor and Taco was allowed to eat it in front her; Mrs. Sanchez spoke to him nicely each time. Taco received a bag of dog treats to thank him for his participation in the experiment.

All of Mrs. Sanchez's dog park friends, plus a few more, likely participated in the experiment, including Mr. Williams and his dog, Daisy the cocker spaniel (who probably peed on the carpet in excitement when the experimenter arrived). However, each of the 14 dogs experienced a different order of the four experimental conditions, just to make sure there wasn't an order effect. All videotaped trials were later scored for the number of nine possible "guilty look" behaviors identified by owners and shown by the dogs during the ten seconds after the owner returned, which Horowitz listed in an ethogram as:

- Averting their gaze
- Lying on their side or on their back
- Lowering the tail
- Rapid, shallow wagging of the tail (if the dog has one)

- Ears down
- Head down
- Moving away from owner
- Raising a paw
- Licking

The total number of "guilty look" behaviors shown by a dog was its "guilty look" score; the more behaviors the dog showed, the higher its score. This score is the dependent variable.

## Questions

5. What were Alexandra's *two* hypotheses to explain the "guilty look" in dogs?

    *Hypothesis 1:*

    *Hypothesis 2:*

6. Alexandra's experimental design had *four* experimental conditions, based on a combination of independent variables (the dog's behavior and the owner's behavior) in a two by two factorial design. Fill in the table below with the four experimental conditions written in the following way: dog's behavior / owner's behavior.

| | | *Owner's Behavior* | |
|---|---|---|---|
| | | Scold (Owner is told dog misbehaved.) | Greet (Owner is told dog obeyed.) |
| *Dog's Behavior* | Eat (Dog is given treat.) | *1.* | *2.* |
| | No Eat (Experimenter took treat.) | *3.* | *4.* |

7. Using the following predictions table, enter Alexandra's two hypotheses in the left-hand column and then enter the four experimental conditions that were used to test these hypotheses along the top. For each experimental condition enter *predictions* for the dog's appearance (Guilty or Not Guilty) that would support the two hypotheses. (*Hint:* the two rows should be different!)

| | | *Experimental Conditions (Dog/Owner)* | | | |
|---|---|---|---|---|---|
| | | *1.* | *2.* | *3.* | *4.* |
| *Hypotheses* | *Hypothesis 1:* | | | | |
| | *Hypothesis 2:* | | | | |

8. Draw two bar graphs, showing the "guilty look" score (Low=1; High=6) for each condition that you think would support each of Alexandra's hypotheses below. To do this, you first will need to decide the labels that should go on each axis. (*Hint:* What are the independent variables? What is the dependent variable?)

*Hypothesis 1:*

*Hypothesis 2:*
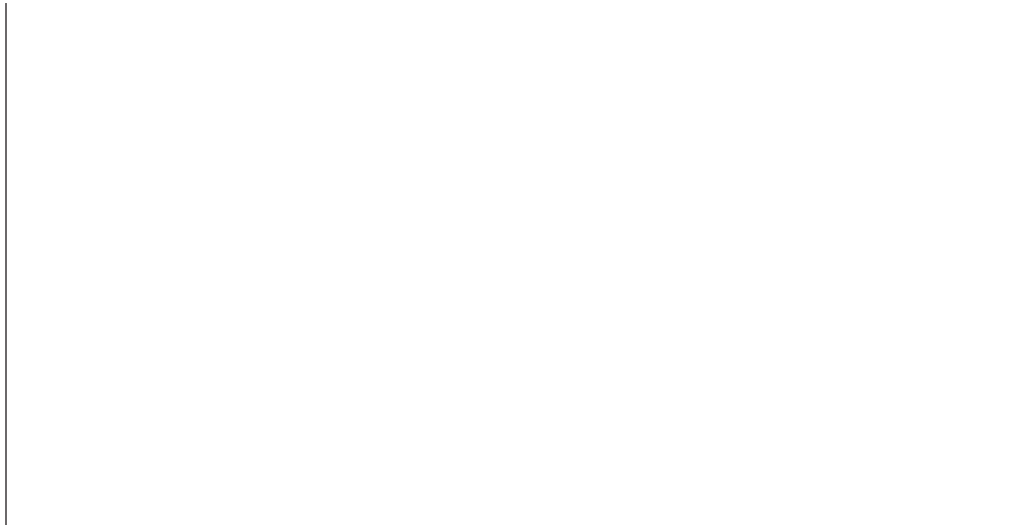
9. Consider the pros and cons of Alexandra's experiment. Do you have any criticisms?

## Part III – Author's Results

Figure 1 is a slightly edited version of Alexandra's graph, showing the mean number of guilty looks that dogs gave depending on the owners' behaviors (scolded or greeted the dog) or the dogs' own behaviors (ate the forbidden treat or not).
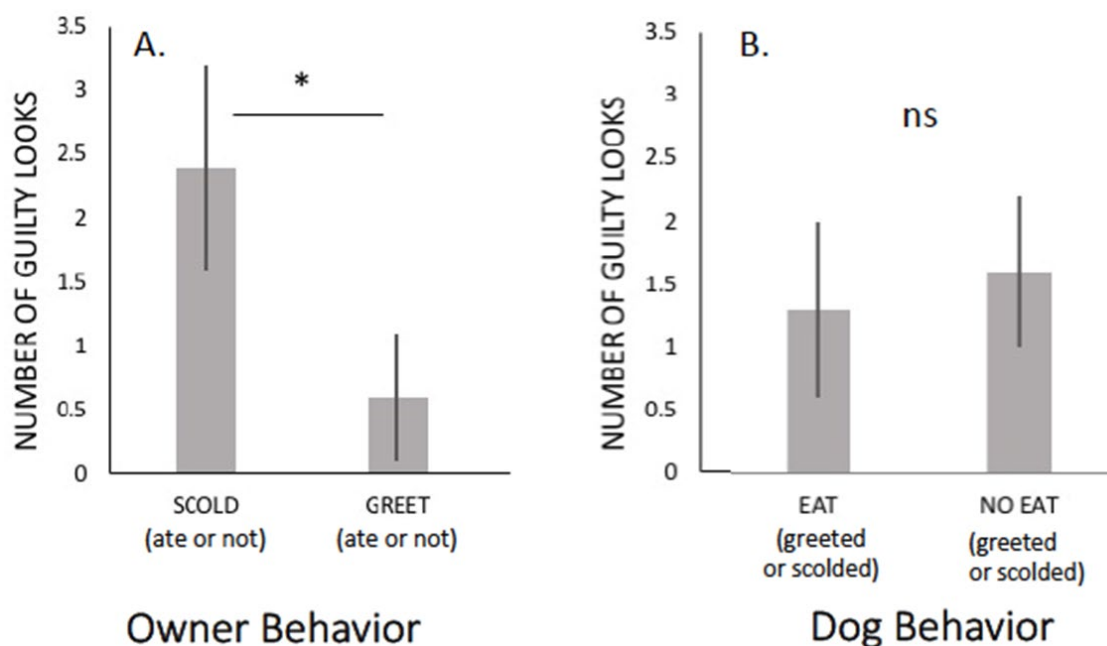


*Figure 1.* Mean number of guilty-look behaviors exhibited by 14 dogs in a 10 second period in response to: (A) Owners' behaviors (scolded or greeted, whether the dog ate the treat or not); (B) Dogs' behaviors (ate or not, whether they were greeted or scolded). Error bars represent 95% confidence intervals. *p<0.001. Adapted from Horowitz (2009).

Alexandra's data analyses showed a number of important points with respect to her hypotheses. First, there was no significant difference in the number of guilty looks exhibited between the eat and no eat conditions, whether the owner greeted the dog or scolded it. Second, scolding was much more likely to lead to guilty looks than greeting the dog whether the dog ate the treat or not. Interestingly, Alexandra found that the highest number of guilty looks occurred when obedient (no eat) dogs were scolded.

### Questions

10. Critique Alexandra's graph. How does it compare to yours? Would you change anything? If so, why?

11. Which hypothesis is best supported by Alexandra's results? Why?

12. Why is it interesting that more guilty looks were seen when obedient dogs were scolded? What does this finding suggest about the dogs' response to scolding?

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## Part IV – Author's Conclusions

In the "Discussion" section of her paper, Alexandra states that the results of her experiment support the hypothesis that dogs' guilty looks occur in response to their owners' scolding behavior, rather than the hypothesis that dogs' guilty looks are a response to their own disobedient behavior in their owners' absence. She suggests that the dogs had likely learned over time to respond to scolding with submissive behaviors (which also look like guilty behaviors) in "fearful anticipation of punishment by the owner" (Horowitz, 2009, p. 451). Indeed, dogs that showed the highest number of guilty looks were those whose owners reported that they had physically punished their dogs for prior misdeeds.

### Questions

13. Based on Alexandra's conclusions, how might the guilty look develop in a dog over time? In other words, what experiences might train a dog to look guilty?

14. Can you draw any firm conclusions from Alexandra's research about whether dogs actually feel guilty? How might this be done?

15. What questions does this study raise about other secondary emotions in dogs, such as jealousy or love? Do you think it is possible to study these emotions experimentally? Morphologically? (Do a literature search!)

16. *Optional (if you read the full published paper by Horowitz):* In addition to submitting answers to the questions above, please submit one or two talking points about the full paper, dealing with an issue we haven't already discussed. This talking point could be:
    - a question you would most like to ask the author;
    - an illustrative quotation from the text, plus a comment or question about it;
    - something you agree with (and why);
    - something you disagree with (and why); or
    - something that seems key, but that you had trouble understanding.