

→ Mark your confusion.

→ Purposefully annotate the article (1-2 mature, thoughtful responses per page to what the author is saying)

→ Write a 250+ word response to the article.

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Do Dogs Feel Guilty?

By Jason G. Goldman for *Scientific American*, 05-31-12

"I walked into the house, and he was acting strange. I could tell he had done something wrong," she told me. I pressed for further details.

"His head was down, and he wasn't making eye contact," she explained. "Then, I found it. Under the bed."

She had spent weeks training her dog, Henry, not to crap on the carpet. And there it was, under her bed. Evidence that he had transgressed. "He knew he had misbehaved, that's why he was acting so guilty," my friend insisted, sure that her dog knew that he had violated her rule.

Seventy-four percent of dog owners believe that their dogs experience guilt. One owner described her reasoning as follows: "I behave in a particular way when I feel guilty; my dog behaves in a similar way in equivalent circumstances; I know intuitively that my behavior is motivated by guilt; therefore the behavior I see in my dog is also accompanied by feelings of guilt." Almost sixty percent of dog owners claim that their dogs' guilty behavior leads them to scold their dog less.

There is plenty of evidence for what scientists refer to as primary emotions - happiness and fear, for example - in animals. But empirical evidence for secondary emotions like jealousy, pride, and guilt, is extremely rare in the animal cognition literature. The argument usually given for this lack of evidence is that such secondary emotions seem to require a level of cognitive sophistication, particularly when it comes to self-awareness or self-consciousness, that may not exist in non-human animals. In other words, guilt is complicated.

However, Charles Darwin observed that the types of behaviors associated with guilt - keeping one's head down, and averting one's gaze - are also seen in other social non-human primate species. On one hand, this should not be too surprising; guilt serves to reinforce social relationships and to minimize the effects of transgressions against social partners. These are important things for any social primate, whether monkey or man. The same patterns have been observed in wolves as well as domesticated dogs. In wolves, it is thought that guilt-related behaviors serve to reinforce social bonds, as in primates, by reducing conflict and eliciting tolerance from other members of the social group. The same could be true of dogs, though their social groups would primarily include humans.

The problem is that the display of the associated behaviors of guilt are not, themselves, evidence of the capacity to emotionally experience guilt. Do guilty behaviors follow from transgressions? If so, that would provide evidence that dogs may be aware of the violation. Or do guilty behaviors instead follow from scolding? This is a reasonable speculation, given that owners tend to scold their dogs less if their dogs "act guilty." If this was the case, guilty behaviors could simply be the result of a learned association between a stimulus (such as crap on the carpet) and impending punishment - not so different from Clever Hans, the famous horse who relied on subtle behavioral clues from his owner in order to "succeed" at mental arithmetic problems. This is an empirical question that can be answered with a clever enough experiment.

A group of canine cognition researchers from Eotvos Lorand University in Budapest, led by Julie Hecht, created just such an experiment, which they report in a paper in press in the journal *Applied Animal Behavior Science*.

Given that so many dog owners report that they believe that dogs who have broken a rule act guilty even before the dog's transgression is discovered, and given that owners report that they are likely to scold their dogs less following the display of guilty behaviors, it stands to reason that dogs' "guilty look" may just be a learned response. If scolded, a guilty look might simply serve to reduce the duration of the negative social interaction. Keeping this in mind, the researchers designed an experiment to answer two questions. First, would dogs who had misbehaved in their owners' absences behave differently when greeting their owners than dogs who had not misbehaved? Second, would owners be able to determine, upon entering a room and relying solely on dog greeting behavior, whether or not their dogs had actually transgressed?

In 2009, Barnard College psychologist Alexandra Horowitz found evidence that dogs were more likely to display behaviors associated with guilt after being scolded, whether or not they had actually been guilty of a perceived violation in the first place. However, in that experiment, dogs who had not misbehaved and were scolded displayed more guilt-associated behaviors than dogs who had been scolded and had actually misbehaved. And those behaviors also appeared in situations in which owners did not scold the dogs at all.

The new experiment was designed to address some of these problems. First, the researchers determined the baseline greeting behavior for each of sixty four dogs, when reunited with their owner after a brief separation. Then, the researchers enforced a social rule that food placed on a table was for humans, not for dogs. Then, dogs were left alone in the room with the food. Then, researchers assessed how dogs greeted their owners after eating or not eating the food. In addition, they assessed whether the owners could determine whether or not the dog had transgressed and eaten the food.

The first finding validated the notion that dogs don't always act guilty - only under certain circumstances. Dogs displayed significantly fewer guilt-related behaviors when being greeted by their owners, compared with when they were scolded. Next, the researchers wanted to see if dogs who had actually transgressed displayed more guilt behaviors than those who had not. The two groups were equally likely to act guilty! Together, these findings provide a potential answer to the first question: dogs who had misbehaved were not statistically likely to behave differently than dogs who had not misbehaved.

However, there was a subtle finding that may have actually provided evidence that the dogs who had misbehaved were more likely to show guilt-associated behaviors. But not in the way you might think. Each dog had three opportunities to greet their owners. Once before the rule had been established, a second time after the rule had been established and dogs had an opportunity to violate the rule, and a third time, after the rule had been established, but without an opportunity to violate the rule. While all dogs were more likely to act guilty during the second greeting while being scolded, only the dogs who had actually transgressed were more likely to continue acting guilty during the third greeting.

The next set of results are just as confusing. Almost seventy-five percent of owners were able to determine whether their dogs had misbehaved, which was significantly more than would have been the result of random guessing. However, it is possible that owners were relying on their dogs' prior behavior to determine whether their dog misbehaved. Each dog had originally been presented with the food prior to the establishment of the social rule, and some of the dogs managed to eat the food before learning the rule. Perhaps, then, the owners were relying not on their dogs' greeting behaviors at all, but on the dogs' prior likelihood of eating the food! After removing those owners (who were aware that their dog had eaten the food before the rule was established) from the analysis, a different result emerged: owners were not successful in determining whether their dogs had misbehaved. They may as well have been guessing randomly.

Like many scientific studies, these results are a bit messy and fairly ambiguous. Why might that be? For one thing, the experiment was a highly unusual procedure for dogs and their owners. It is possible that there were so many new, salient stimuli in the testing room - including the unfamiliar researchers - that the dogs did not have enough working memory available to successfully encode the no-eating rule. It is also possible that previous in-test greetings or scoldings altered the later in-test greeting behaviors. The researchers acknowledge as much, writing, "an ambiguous social situation generated by repeated scoldings and greetings - not uncommon for experiments investigating guilty behavior - could affect the behavioral displays in question in a complex way." While not uncommon for these experiments, these situations are far removed from more typical dog-owner interactions and the environments in which they occur.

Taken together, these results both support the common anecdote, that dogs act guilty prior to their owners' awareness of the violation, as well as the earlier scientific findings that, regardless of transgression, dogs act guilty in response to being scolded by their owners.

Future research, according to the researchers, ought to investigate these questions in a familiar environment rather than in a laboratory, and should examine a social rule that has already been established between an owner and a dog. It may still be some time before we can know for certain whether dogs can experience guilt, or whether people can determine if a dog has violated a rule prior to finding concrete evidence of it.

But! - dog owners, take heart. Even that great observer of animal behavior Konrad Lorenz wrote of the dog's "guilty look," saying that we can "assume with certainty that it hides a guilty conscience."

Response option(s):

- According to the author, why is it "complicated" to answer the seemingly simple question, "Do dogs feel guilty?"
- How did Hecht and her canine cognition researchers answer the title question? What did they find, and what is still uncertain? Explain.
- Pick any passage and respond to it.