

The New York Times

WELL PETS

The Look of Love Is in the Dog's Eyes

By Jan Hoffman

April 16, 2015 3:07 pm

Those big brown eyes gaze at you, deeply. Your heart leaps. You caress, murmuring sweet nothings. And as those big browns remain fixed on you, the tail wags.

Devoted dog. Besotted owner. That continuous loop of loving reinforcement may begin with the dog's gaze, according to a new report in *Science*.

Japanese researchers found that dogs who trained a long gaze on their owners had elevated levels of oxytocin, a hormone produced in the brain that is associated with nurturing and attachment, similar to the feel-good feedback that bolsters bonding between parent and child. After receiving those long gazes, the owners' levels of oxytocin increased, too.

The dog's gaze cues connection and response in the owner, who will reward the dog by gazing, talking and touching, all of which helps solder the two, the researchers said. They suggest that dogs became domesticated in part by adapting to a primary human means of contact: eye-to-eye communication.

And when researchers gave dogs extra oxytocin through a nasal spray, the female dogs (though not the males) gazed at their owners even longer, which in turn boosted the owners' oxytocin levels.

“What's unique about this study is that it demonstrates that oxytocin can

boost social gaze interaction between two very different species,” said Steve Chang, an assistant professor of psychology and neurobiology at Yale who was not involved in this latest research.

Dr. Chang, who studies oxytocin in animals, noted that through domestication, dogs came to regard humans as their “key social partners,” while humans also came to view dogs as social partners.

“In a way, domesticated dogs could hijack our social circuits, and we can hijack their social circuits,” he said in an email, as each species learned how to raise the other’s oxytocin levels, facilitating connection.

The researchers also tested wolves raised by humans to see whether a wolf-to-owner gaze would raise oxytocin levels in either or both. But compared with dogs, the wolves scarcely gazed at their owners, and the owners’ oxytocin levels barely budged.

Unlike dogs, wolves “tend to use eye contact as a threat” and are inclined to “avoid human eye contact,” wrote Miho Nagasawa, a study author and research fellow at Jichi Medical University.

In an email, Dr. Takefumi Kikusui, a professor in the School of Veterinary Medicine at Azabu University, wrote that he believes that the differences in gaze between dogs and wolves means “that dogs have acquired this superior ability during the evolutionary and domestication process of living with humans.”

He continued: “There is a possibility that dogs cleverly and unknowingly utilized a natural system meant for bonding a parent with his or her child.”

In the first experiment, researchers measured oxytocin levels in the urine of 30 owners and dogs before and after they interacted for 30 minutes. The dogs were males and females, spayed, neutered and intact. The breeds included Golden retrievers, standard poodles, miniature Dachshunds,

miniature Schnauzers, a Jack Russell Terrier, and two mongrels. They also measured oxytocin in five wolves and their owners.

The changes in oxytocin were most pronounced in dogs who fixed longer gazes on their owners, which researchers defined as 100 seconds in the first five minutes of the encounter. They saw no significant difference in oxytocin levels among the breeds or sex of the dogs.

In the second experiment, researchers administered nasal sprays of either saline or oxytocin to dogs. This time, each dog entered a room with three humans: its owner and two strangers. But now, only the female dogs who were given the oxytocin displayed an even longer gaze at their owners, who in turn had spikes in their oxytocin levels. Researchers could not say why the sex of the dog mattered. But they speculated that vigilance in male dogs, set off by the presence of the two strangers, may have moderated the effects of oxytocin.

Other experts on canine behavior expressed caution about overstating the implications of this study.

Dr. Alexandra Horowitz, director of the Dog Cognition Lab at Barnard College, called the study “a fascinating direction of research, because it looks at connections between behavioral measures and hormonal components.” She noted that it raised many intriguing questions: about long and short gazes; why only female dogs reacted to the oxytocin dose; whether other breeds would yield different results. But pointing to the small size of the sample, she added, “I don’t know how it proves the domestication thesis.”

And then there is the meaning of a dog’s “gaze.” The human gaze is layered with nuance. Dog owners may ascribe similar complexity to their dog’s gaze, certain that they, like parents, can interpret it. (A view endorsed by this owner of a Havanese, whose eager, soulful gaze is both long and expressive, punctuated by cocking his head, and fluttering his ears forward. Speaks volumes.) “If your dog’s gaze helps you think your dog understands you,” said Dr. Horowitz, “that produces bonding.”

But Evan L. MacLean, co-director of the Duke Canine Cognition Center and a co-author of a commentary accompanying the study, said, “We don’t know what the dog’s gaze means. When you look at a human baby, it feels good. Maybe dogs gaze at you because it feels good. Maybe the dogs are hugging you with their eyes?”

But Dr. MacLean, an evolutionary anthropologist, said that fundamentally, for dogs, human behavior is “the telltale of everything that is about to happen.” Are we going to stand or sit? Leave the room? Bring food?

And so they stare at us, fixedly.

“If I was dropped on Mars,” Dr. MacLean said, “and everyone was speaking a language I didn’t understand, and I knew I could never acquire their language, I’d just give up. But dogs don’t. They’re not reluctant to tune in to us at every moment.”

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