

# What Petting a Dog Does to Your Brain

How does petting - and even looking at - a dog affect your brain, specifically the prefrontal cortex, an area that plays a role in memory, problem solving and attention control? What types of activities cause your brain to light up the most? Can a stuffed animal provide the same feel-good benefits?

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## STORY AT-A-GLANCE

- Petting and even viewing a dog lead to higher levels of activity in the prefrontal cortex of the brain, an area that helps regulate and process social and emotional interactions
- The effects were greater when interacting with an actual dog, as opposed to a stuffed animal, suggesting that spending more time with a pup may have significant effects on your mental health
- Looking at a dog led to the lowest level of brain activity, followed by passive contact, such as reclining with a dog against their legs, which led to higher levels
- Brain activity levels were the highest upon actively petting the dog and also increased with repeated contact, a pattern that wasn't seen when interacting with the stuffed toy
- Interacting with animals is typically perceived as an emotionally relevant experience for most people, interacting with the dog led to higher emotional involvement, which may have triggered greater brain activity in the prefrontal cortex

Dog lovers already know there's something special about giving a dog a pat. Now, researchers from the University of Basel in Switzerland have revealed why interacting with dogs may feel so good.<sup>1</sup> Petting and even viewing a dog lead to higher levels of activity in the prefrontal cortex of the brain, an area that helps regulate and process social and emotional interactions.<sup>2</sup>

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## Brain Activity Increases the More You Interact With a Dog

The study involved 19 people who took part in six sessions, half with a dog — a 6-year-old Jack Russel terrier, a 4-year-old golden retriever or a 4-year-old goldendoodle — and three with a stuffed lion named Leo, which contained a warm water bottle to feel more like a live animal.<sup>3</sup> Five levels of interaction were analyzed, starting with neutral and progressing to watching the animal, feeling the animal, stroking its fur and back to neutral.

Activity in the prefrontal cortex was measured with infrared neuroimaging technology. Activity in the prefrontal cortex increased along with each level of interaction. Looking at a dog led to the lowest level of brain activity, followed by passive contact, such as reclining with a dog against their legs, which led to higher levels.

Brain activity levels were the highest upon actively petting the dog and also increased with repeated contact, a pattern that wasn't seen when interacting with the stuffed toy. "There seems to be a difference, especially between the first and the second contact with the dog suggesting that familiarity might play a different role in interactions with live and plush animals," the researchers explained.<sup>4</sup>

Further, clear differences were seen in brain activity when participants interacted with a dog or a stuffed animal. According to the study:<sup>5</sup>

*"We found that prefrontal brain activity increased with a rise in the intensity of contact with a dog or a plush animal. From watching the animal to feeling it passively to actively petting the animal, the interactional closeness increased and, with it the intensity of stimulation as well as the number of senses involved. This led to an increase in brain activation."*

## **Why Does Petting a Dog Light Up Your Brain?**

Several hypotheses were given about why interacting with a real dog exerts a more powerful influence on the brain than interacting with a stuffed animal. The brain region involved gives one clue, as the prefrontal cortex plays a role in executive functions, such as working memory, problem solving and attention control, along with social and emotional processes.

"It has reciprocal connections with brain regions that are involved in emotional processing such as the amygdala and higher-order sensory regions within the temporal cortex," the researchers explained.<sup>6</sup> Since interacting with animals is typically perceived as an emotionally relevant experience for most people, they suggested interacting with the dog led to higher emotional involvement, which led to greater brain activity in the prefrontal cortex.

The experience of touching a live dog is also more complex than interacting with a plush animal, and may lead to increased physiological arousal along with increased brain activity because of a developing relationship between the human and the dog. "Familiarity and a relationship with the dog could have raised the salience of the dog, kept the participant's attention on the dog's behavior, and increased emotional arousal during the experiment," according to the study.<sup>7</sup>

The findings could have significant implications for people with deficits in motivation, attention and socioemotional functioning, as interacting with a dog as part of animal-assisted therapy could increase emotional involvement and, in turn, improve learning and help achieve therapeutic goals. While the featured study involved healthy adults, future studies may focus on people with social or emotional issues to determine if petting a dog is beneficial.<sup>8</sup>

## **Petting a Dog Relieves Stress**

Past research also shows that interacting with animals such as dogs and cats — even for as few as 10 minutes — has a stress-relieving effect.<sup>9</sup> In a study of university students, who often report high levels of stress, petting a dog for 10 minutes decreased levels of cortisol, a measure of stress, suggesting "hands-on petting of cats and dogs provides momentary stress relief."<sup>10</sup>

Researchers with Indiana University School of Medicine similarly found that even five minutes of interaction with a therapy dog helps lower stress levels in physicians and nurses working in an ER.<sup>11</sup> Therapy dogs have been found to help people reduce not only stress but also pain, anxiety and anger, while increasing feelings of support and comfort.

However, even having a pet dog at home is likely to offer benefits to your mood, as petting your pup lowers stress and increases levels of a feel-good hormone, oxytocin.<sup>12</sup> If you're intrigued by the social and emotional benefits of dog ownership but aren't ready to sign up for the responsibility permanently, consider fostering. You can spend time with a dog in need, helping your own emotional health while the pup waits to find her forever home.

## Sources and References

<sup>1,4,5,6,7</sup> [PLOS One October 5, 2022](#)

<sup>2</sup> [Scimex October 6, 2022](#)

<sup>3,8</sup> [Science Alert October 6, 2022](#)

<sup>9,10</sup> [AERA Open June 12, 2019 Volume: 5 issue: 2](#)

<sup>11</sup> [Academic Emergency Medicine April 7, 2020](#)

<sup>12</sup> [Johns Hopkins Medicine, The Friend Who Keeps You Young](#)

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