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Study Finds Therapy Dogs Have No Effect on Anxiety in Teens

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New study of therapy dogs shows the importance of publishing negative results.

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Senator Ben Kramer recently introduced a bill in the Maryland legislature that would allow the use of therapy dogs in all of the state's schools. Therapy dogs, he said, can calm down anxious students. Is he right? And how good is the science behind this claim?

Over the past 15 years, research on animal-assisted therapies has taken off. The number of papers published on the use of therapy dogs, for example, jumped from 19 in 1990 to 698 in 2020. Many of these have reported successes. But why canine therapy seems to work in some situations remains a mystery.

Source: Graph by Hal Herzog

This question was recently taken on by a Tufts University research team led by developmental psychologist Megan Mueller. Based on previous research, the investigators hypothesized that two mechanisms might mediate the ability of therapy dogs to reduce stress—social support and touching the dogs. The researchers were confident that interacting with therapy dogs would cause anxiety to drop, but they sought to disentangle the impact of touch and social support. Further, the researchers wanted to focus on stressed-out adolescents as there has been little research on the effectiveness of animal-assisted therapies with this age group.

The results are in were published in the journal *Anxiety, Stress, & Coping*. The researchers, to say the least, were surprised by their findings.

What the Researchers Did

The details of the study are a bit complicated, but here's a brief description. After being matched for their basic anxiety levels, 68 teens between ages 13 and 17 were placed in either therapy-dog groups or a no-dog control group. All of the subjects were then given a series of tasks that psychologists use to induce stress in kids—the Trier Social Stress Task for Children. The first stage of the task was a 20-minute acclimation period in which the study was explained and subjects were shown a picture of their therapy dog. During this time, the researchers measured their baseline stress levels.

Then the stressful part of the study began. It lasted 15 minutes. First, the subjects were given five minutes to prepare a short speech on an aspect of history. They then had five minutes to give their speech. Immediately after the speech, they had to complete a mental arithmetic task in which they serially subtracted either 11 or 17 backward from 100. At the end of the session, the teens had a 30-minute recovery period when they could watch a documentary film on an iPad.

The researchers used three measures to assess changes in anxiety during the session. The measures were taken six times during the stages of the Social Stress Task.

- *Self-reported anxiety* was assessed by having the subjects rate how they were feeling using six words on a three-point scale (for example, "very calm," "calm," "not calm").
- *Physiological reactivity* was assessed by wristband sensors that measured the subjects' heart rate and skin electrical conductivity, a measure of sweating.
- *Cognitive performance* was measured by counting the number of errors the subjects made on the mental arithmetic test.

Each teen was randomly assigned to one of three groups. In all three conditions, a dog handler was in the room with the subject during the session. However, other than a brief introduction, the handlers did not talk to the subjects during the sessions.

- The Social Interaction Group: In this condition, the subjects performed the stress tasks in the presence of a trained therapy dog and its handler. The dog was on the floor next to the subject. The teens could talk to the dog but were told not to touch it.
- The Social Plus Touch Group: In this condition, the therapy dog sat in a chair next to the subject. The kids were told they could touch and talk to the dog during the session.
- The No-Dog Control Group: In the control condition, a stuffed toy dog was placed in the chair next to the kids. The "handler" was also in the room.

What the Researchers Expected to Find

The investigator's first hypothesis: compared to the control group, the teens in the two therapy dog groups would:

1. have lower self-reported anxiety scores
2. lower physiological stress indicators (heart rate and skin response)
3. make fewer mistakes on the mental arithmetic task

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Their second hypothesis was that subjects who got to touch their therapy dog would have lower anxiety and stress scores than the participants who could talk to their therapy dog but not physically interact with it.

What the Researchers Found

As the researchers expected, the Social Stress Task was successful in stressing out the teens. The anxiety levels of the subjects drifted down a little during the initial 30-minute baseline stage, but they immediately shot up during the fifteen minutes when they were preparing and delivering their speeches and completing the math test. During the 30-minute recovery period, their scores went back to baseline levels. Increases and decreases in the teens' heart rates and skin responses generally showed the same pattern.

The big surprise was that the therapy dogs had absolutely *no impact* on any of the anxiety measures.

- *No effect on self-reported anxiety scores*
- *No effect on heart rate and skin response*
- *No effect on mental math errors*

In short, interacting with a therapy dog was no more effective at reducing short-term anxiety in teens than sitting next to a stuffed toy dog.

Are These Results an Anomaly?

As I have described in previous posts, the media hype about the ability of animals to cure human ills does not match up to actual research findings. (See here, here, and here.) This headline in the *Washington Post* got it right: "Therapy Animals Are Everywhere, But Proof That They Help Is Not."

For a couple of reasons, I was not surprised by the Tufts teams' results. First, other recent studies have found therapy dogs had little or no effect on well-being. For example, a large multi-site randomized control study found that interacting with therapy dogs had no impact on the anxiety levels of children undergoing cancer treatments. Researchers at Virginia Commonwealth University reported that therapy dog visits did not reduce the pain and anxiety experienced by hospitalized kids. And, in a recent review, British researchers found that nearly half of 39 studies on the impact of dog-assisted interventions in long-term care facilities found no impact of therapy dog visits.

More troubling is the possibility that the research on animal-assisted therapies is showing signs of the dreaded "decline effect" in science. This is a phenomenon in which the results in an area that initially shows promise don't pan out once the studies get better. The much-ballyhooed Mozart effect on intelligence, for example, suddenly evaporated once the quality of the research improved.

Why Is This Study Important?

Virtually every review of research on therapy dogs has concluded that the quality of this body of research is generally poor. The Tufts team, in contrast, did just about everything right.

Their study:

- was preregistered on the Open Science Framework (this means you publicly specify your hypotheses in advance)
- had adequate numbers of subjects
- controlled for individual differences in anxiety
- randomly assigned subjects into conditions
- controlled for effects of the therapy dog handlers
- included objective physiological measures as well as subjective measurements

Further, the researchers did not sugar-coat the results. Indeed, their conclusion was a model of clarity: *"Contrary to our hypotheses, there was no convincing evidence that the presence of a real dog, with or without the opportunity to touch it, reduced anxiety, autonomic activity, or increased cognitive performance relative to the presence of a stuffed dog."*

What impressed me most about this study is that the researchers published their results. Too often investigators only submit their positive results for publication. This practice results in a positive publication bias. This is called the file drawer problem because negative results usually never see the light of day. This is a huge problem as this practice leads researchers down alleys that are dead ends. Indeed, entire areas in psychology have turned out to be based on houses of cards because so many investigators publish only their positive results.

One of the cornerstones of science is that it is self-correcting. But this can only occur if researchers dare to put all the results of high-quality studies out there for all to see. (See "Unpublished Results Hide the Decline Effect.")

Hat's off to Megan Mueller and her colleagues for setting a high methodological bar and for publishing unexpected findings that may be unwelcome in some circles. As studies improve, time will tell whether canine-assisted therapy turns out to be a widely accepted treatment for human emotional distress or, like the Mozart Effect, disappear.

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