

Dogs can smell when we're stressed, study suggests

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A study dog sniffing a person's breath and sweat sample. Credit: Kerry Campbell, CC-BY 4.0 (creativecommons.org/licenses/by/4.0/)

The physiological processes associated with an acute psychological stress response produce changes in human breath and sweat that dogs can

detect with an accuracy of 93.75%, according to a new study published this week in the open-access journal *PLOS ONE* by Clara Wilson of Queen's University Belfast, U.K., and colleagues.

Odors emitted by the body constitute chemical signals that have evolved for communication, primarily within species. Given dogs' remarkable sense of smell, their close domestication history with humans, and their use to support human psychological conditions such as anxiety, [panic attacks](#) and [post-traumatic stress disorder](#) (PTSD), researchers wondered whether dogs could be sensing chemical signals to respond to their owners' psychological states.

In the new study, the researchers collected samples of breath and [sweat](#) from non-smokers who had not recently eaten or drunk. Samples were collected both before and after a fast-paced arithmetic task, along with self-reported stress levels and objective physiological measures: [heart rate](#) (HR) and [blood pressure](#) (BP).

Samples from 36 participants who reported an increase in stress because of the task, and experienced an increase in HR and BP during the task, were shown to trained dogs within three hours of being collected. Four dogs of different breeds and breed-mixes had been trained, using a clicker as well as kibble, to match odors in a discrimination task. At testing, dogs were asked to find the participant's stress sample (taken at the end of the task) while the same person's relaxed sample (taken only minutes before, prior to the task starting) was also in the sample line-up.

Overall, dogs could detect and perform their alert behavior on the sample taken during stress in 675 out of 720 trials, or 93.75% of the time, much greater than expected by chance (p

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