

Dogs mirror owner's stress

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Lina Roth, senior lecturer, Linköping University. Credit: Lina Roth

The levels of stress in dogs correlate with the stress of their owners, according to a new study from Linköping University, Sweden. The scientists believe that dogs mirror their owner's stress level, rather than

vice versa. The study has been published in the scientific journal *Scientific Reports*.

Researchers at Linköping University have examined how stress levels in dogs are influenced by lifestyle factors and by the people that the dogs live with. Previous work has shown that individuals of the same species can mirror each others' emotional states. There is, for example, a correlation between [long-term stress](#) in children and in their mothers. The recently published study arose from scientists speculating whether similar mirroring of stress levels over long time periods can also arise between species, such as between the domesticated dog and humans. The researchers determined stress levels over several months by measuring the concentration of a stress hormone, cortisol, in a few centimeters of hair from the dog and from its owner.

"We found that the levels of long-term cortisol in the dog and its owner were synchronized, such that owners with high cortisol levels have dogs with [high cortisol levels](#), while owners with low cortisol levels have dogs with low levels," says Ann-Sofie Sundman of the Department of Physics, Chemistry and Biology (IFM) at LiU, principal author of the study and newly promoted doctor of ethology.

The study examined 25 border collies and 33 Shetland sheepdogs, all of them owned by women. The owners and the dogs provided hair samples on two occasions separated by a few months. Since [physical activity](#) can increase cortisol levels, the researcher also wanted to compare companion dogs with dogs that competed in obedience or agility. The physical activity levels of the dogs were therefore recorded for a week using an activity collar.

Previous research has shown that levels of short-term cortisol in saliva rise in a synchronous manner in both the dog and its owner when they compete together. The study presented here, in contrast, found that

physical activity in dogs does not affect the long-term [cortisol](#) in their hair. On the other hand, the stress level of competing dogs seems to be linked more strongly with that of the owner. The scientists speculate that this may be associated with a higher degree of active interaction between the owner and the dog when they train and compete together.



Ann-Sofie Sundman, Ph.D., Linköping University. Credit: Veronica Thoresson

The dog owners were also asked to complete two validated questionnaires related to their own and their dog's personality. The researchers investigated whether [stress levels](#) are correlated with personality traits.

"Surprisingly enough, we found no major effect of the dog's personality

on long-term stress. The personality of the owner, on the other hand, had a strong effect. This has led us to suggest that the dog mirrors its owner's stress," says senior lecturer Lina Roth, also at IFM, and principal investigator for the study.

The result suggests that the match between an owner and a dog affects the dog's stress level. Further studies are, however, needed before we can draw any conclusions about the cause of the correlation. The researchers are now planning to study other breeds. Both the border collie and the Shetland sheepdog are herding dogs, which have been bred to collaborate well with humans and respond accurately and quickly to signals. The research group is planning to investigate whether a similar synchronization takes place between dogs and humans in, for example, hunting [dogs](#), which have been trained to be independent. Another line of research will look at whether the sex of the owner plays a role.

"If we learn more about how different types of dog are influenced by humans, it will be possible to match dog and owner in a way that is better for both, from a stress-management point of view. It may be that certain breeds are not so deeply affected if their owner has a high [stress](#) level," says Lina Roth.

More information: Long-term stress levels are synchronized in dogs and their owners, *Scientific Reports* (2019). [DOI: 10.1038/s41598-019-43851-x](#) , www.nature.com/articles/s41598-019-43851-x

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