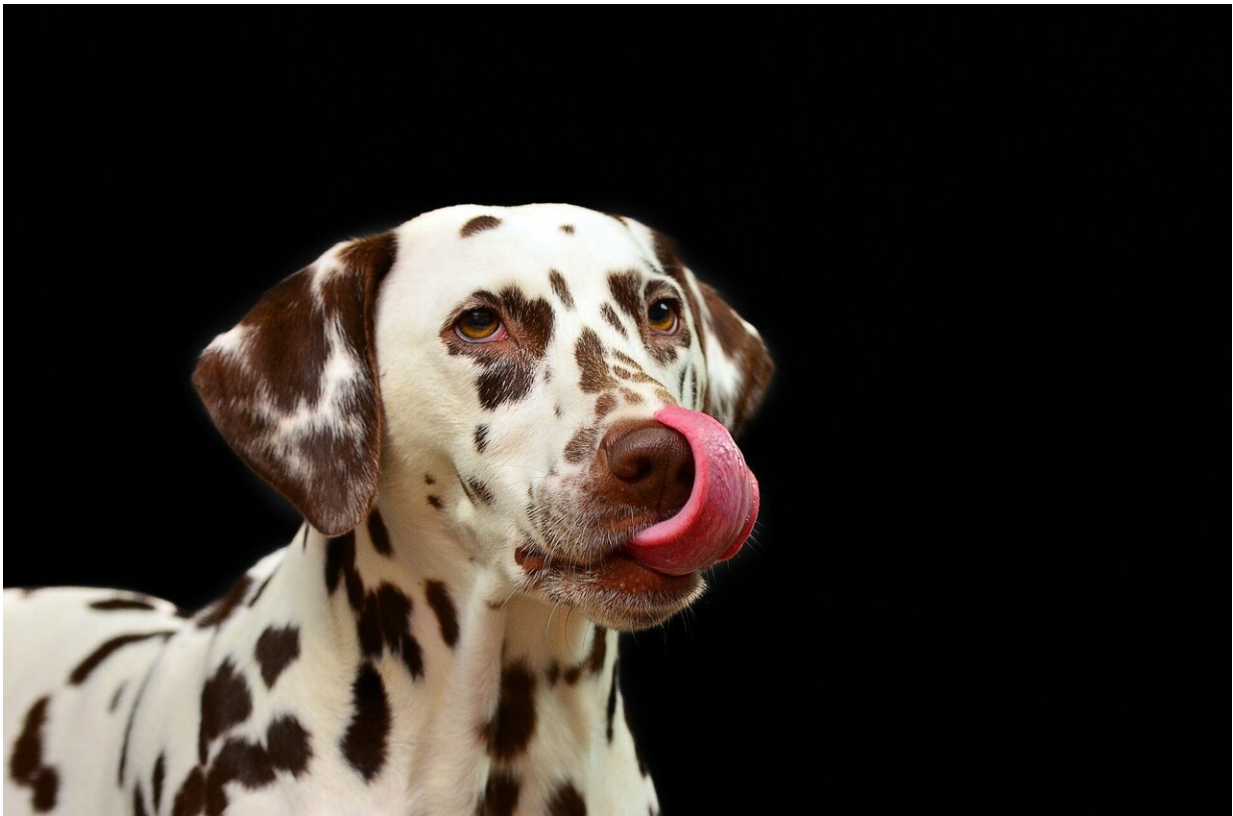


Behavioural correlations of the domestication syndrome are decoupled in modern dog breeds

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Scientists since Darwin have been intrigued by the simultaneous alteration of multiple morphological, physiological and behavioural traits

across a wide range of domesticated animals, such as horses, pigs and dogs. For instance, reduced brain size, floppy ears, increased docility and hormonal changes are commonly seen in domesticated animals but not their wild ancestors. This phenomenon is known as the domestication syndrome, and the traits within this syndrome are assumed to change together in a correlated fashion during domestication. But surprisingly, whether or not any of these traits are in fact correlated has never been formally tested.

A new study published in *Nature Communications* by a team of researchers from Stockholm University used behavioural data from more than 76,000 [dogs](#), to test the hypothesis that key behaviours in the [domestication syndrome](#) are correlated. Domesticated animals are more social and playful, and less aggressive and fearful than their wild counterparts. Because domestication drives behavioural change in which aggression and fearfulness decrease while sociability and playfulness increase, there is an expectation that behavioural alterations during domestication are correlated in a direction-specific manner. For instance, we should expect sociability to be positively correlated with playfulness, but negative correlated with aggression and so forth. These assumed correlational patterns were exactly what the researchers tested in dogs.

The dataset of 76,158 dogs came from the Swedish Kennel Clubs database and consisted of dogs that had completed the Dog Mental Assessment, a behavioural test that thousands of Swedish dogs go through every year. In this test, behavioural responses to varying kinds of stimuli are assessed under standardized conditions, and among these responses are the behaviours in the domestication syndrome; aggression, fearfulness, sociability and playfulness. With this dataset the researchers had a unique opportunity to test the domestication syndrome hypothesis on an extraordinary large sample size of dogs.

The 78 dog breeds in the study, which ranged from Akitas to Chihuahuas to Mastiffs, were divided into ancient and [modern breeds](#). Ancient breeds belong to a small group of dogs in which wolf genes can still be detected, and this [breed](#) group is believed to have an origin approximately 500 years ago. Modern breeds, which make up the majority of present-day dog breeds, have no detectable wolf component and an origin less than 200 years ago. This division of breeds representing early and late stages of dog domestication allowed the researchers to test the domestication syndrome hypothesis on a temporal evolutionary scale.

"Surprisingly, we found that the correlations among behaviours varied between dog breeds representing early and late stages of domestication. The expected correlations among our measured behaviours are generally strong in ancient breeds, such as Siberian Huskies and Alaskan Malamutes, but several of these correlations are weak or gone in the modern breeds, such as Golden Retrievers and Dalmatians," says Christina Hansen Wheat from Stockholm University. This difference between ancient and modern breeds suggests that the behaviours of the domestication syndrome have been decoupled during dog domestication. This decoupling could be caused by a recent shift in selection pressures in modern dog breeds for highly breed-specific traits, such as colour, coat structure or specific behaviours. Importantly, this means that domestication-related behaviours can be selected upon independently in modern [dog breeds](#). With the recent increased focus on animal domestication, and the domestication syndrome in particular, this study provides new insight that invites for a re-evaluation of our expectations to how domestication affects [behaviour](#).

More information: Christina Hansen Wheat et al, Behavioural correlations of the domestication syndrome are decoupled in modern dog breeds, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-10426-3](#)

Provided by Stockholm University

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