# Domestic cat and dog skull shapes converge due to selective breeding, study finds



New research has revealed striking similarities in skull shape between domestic cats and dogs, despite the evolutionary separation of these two species by approximately 50 million years. Conducted by evolutionary biologist Abby Grace Drake and her colleagues, the study investigated 1,810 skulls from various cat and dog breeds, uncovering an unexpected convergence in certain skull characteristics.

The research employed 3D scans from museum specimens, veterinary institutions, and digital archives, covering a diverse range of breeds. Included in the analysis were domestic cats like the Persian, Siamese, and Maine Coon, as well as over 100 dog breeds, spanning from short-muzzled pugs to long-muzzled collies. The findings indicate that domestication has significantly increased skull shape diversity, resulting in a resemblance between some breeds of cats and dogs, particularly those with flat faces.

This phenomenon is not entirely new within the field of evolutionary biology, where “convergence” describes how unrelated species can independently evolve similar traits in response to comparable environmental pressures. Conversely, “divergence” refers to the process through which species become more distinct over time. The research highlights that human intervention through selective breeding has inadvertently driven different species of domesticated animals toward similar physical traits.

A particularly striking example of this is seen in flat-faced breeds like Persians and pugs, which share anatomical features characteristic of extreme selective breeding. As noted in the findings, domesticated breeds of both cats and dogs now exhibit ranges of skull shapes that are more extreme than those found in their wild ancestors, such as wolves and wildcats.

This trend towards convergence has led to concerns regarding the health implications for these animals. The UK government's Animal Welfare Committee has recently expressed serious concerns about the ramifications of selective breeding, noting that selecting for extreme physical traits has resulted in various health complications. Reported issues include breathing difficulties and neurological conditions, which can stem from exaggerated skull shapes and other hereditary traits.

Additionally, the research delves into the psychological aspects of pet selection. Humans tend to favour physical characteristics that resemble those of infants, such as rounded heads and large eyes. This phenomenon, known as “social releasing,” reflects a deep-seated instinct to care for vulnerable beings. The study suggests that traits that elicit caregiving behaviours in humans have become inadvertently reinforced in domesticated animals.

While such traits might enhance a pet's appeal, they can lead to significant health problems. Grace Carroll, a lecturer in Animal Behaviour and Welfare at Queen's University Belfast, underscores the need for awareness regarding the consequences of selective breeding. The committee's reports have advocated for stronger regulations on breeding practices, especially for breeds known to suffer from severe hereditary health issues.

The findings serve as a crucial reminder of the complex relationship between human preferences and the welfare of domesticated animals, illustrating how swiftly evolutionary processes can be influenced by artificial selection. As the conversation surrounding animal welfare continues, the implications of these discoveries resonate within the ongoing discourse on responsible breeding and the ethical treatment of pets.

Source: [Noah Wire Services](https://www.noahwire.com)

## References

* <https://anatomypubs.onlinelibrary.wiley.com/doi/full/10.1002/ar.24471> - This study investigates how selective breeding for reduced facial features in domestic dogs has impacted their neuroanatomy, highlighting the significant effects of human intervention on canine skull morphology.
* <https://kb.rspca.org.au/knowledge-base/what-are-the-health-and-welfare-issues-associated-with-exaggerated-physical-features-in-cats/> - The RSPCA discusses the health problems associated with exaggerated physical features in cats, such as flat faces, including breathing difficulties and dental issues, underscoring the welfare concerns related to selective breeding.
* <https://bsava.com/position-statement/inherited-diseases-and-exaggerated-characteristics/> - The British Small Animal Veterinary Association (BSAVA) acknowledges that selective breeding for exaggerated characteristics in companion animals, including cats and dogs, has led to health and welfare issues, emphasizing the need for responsible breeding practices.
* <https://www.smithsonianmag.com/science-nature/evolution-petface-180967987/> - This article explores how selective breeding for physical traits in pets, such as flat faces in dogs, has led to health problems and discusses the evolutionary implications of these breeding practices.
* <https://www.pbs.org/wnet/nature/dogs-that-changed-the-world-selective-breeding-problems/1281/> - PBS Nature examines how selective breeding in dogs has resulted in health issues, including breathing problems in brachycephalic breeds, highlighting the consequences of breeding for specific physical traits.
* <https://www.smithsonianmag.com/smart-news/the-selective-breeding-of-english-bulldogs-has-led-to-a-lot-of-health-problems-180980271/> - This article details how selective breeding of English Bulldogs for specific physical traits has led to numerous health problems, including skin infections and breathing difficulties, illustrating the impact of breeding practices on animal health.
* <https://www.independent.co.uk/news/science/cats-dogs-evolution-b2744251.html> - Please view link - unable to able to access data