

and seem to regulate whether an animal comes out as more dominant or more submissive after a conspecific agonistic interaction. It is hypothesized that both baseline and changes in testosterone and cortisol levels can predict the outcomes of social interactions between cohabiting dogs. If cohabiting dogs form a consistent social rank structure, these outcomes may be predicted by owner questionnaire responses.

**Key words:** dogs; *Canis*; social behavior

## 10

### Assessing therapy dogs' welfare in animal-assisted interventions

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The inclusion of animals as a therapeutic adjunct is becoming increasingly popular in mental health institutions. Past studies focused primarily on human physical and psychological health rather than animal welfare. Thus, the main purpose of this study was to evaluate the physiological and behavioral effects of animal-assisted interventions (AAs) on therapy dogs ( $n = 21$ ). The dogs participated in weekly group therapy (8–10 patients) sessions in adult mental health care. We determined home and pre-post session levels of salivary cortisol, a glucocorticoid hormone which fluctuates with psychological stress and arousal. Moreover, video recordings were analysed to monitor dogs' motion (lay, sit, stand, walk and run) and specific behaviors (yawning, lip licking, paw lifting, body shake and body stretch). We found that salivary cortisol levels do not increase during AAs in certified, experienced therapy dogs or therapy dogs in training. However, in dogs that are off the lead, working cortisol levels significantly decreased in comparison to dogs on the lead. In addition, there was no difference between baseline samples taken at work or at home. Video analysis of five dogs' motion and specific behaviors during five subsequent AA sessions indicated no differences in frequency or duration of target behaviors, but negative correlations of lip licking and cortisol were detected. The results of this investigation shall provide insights into the physiological and behavioral welfare of dogs in AAs and furthermore contribute to increase the standards of education, certification and, most importantly, the quality of life in therapeutic dogs.

**Key words:** animal-assisted therapy; dogs; animal welfare; cortisol; behavior

## 11

### Physical prompts to anthropomorphism of the domestic dog (*Canis familiaris*)

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Morphological qualities could be instrumental to when and why humans anthropomorphize dogs. This study contributes to the investigation of the physical prompts for anthropomorphizing dogs by exploring human preference for specific physical attributes. One hundred twenty-four human subjects participated in an aesthetic preference test in which they viewed 80 matched image-pairs of mixed-breed adult dogs. Both instances of the image-pairs had a single feature—such as eyes, jowls, and nares—that was modified in size to create a difference of 15% between the two images. The chosen features were those customarily associated with neoteny, ostensible human similarity, symmetry, size, and dog health. The images of each pair thus differed slightly, nearly imperceptibly, in order to explore the contribution of particular physical attributes to humans' avowed preference for one dog over another.

Subjects evinced a preference for human-like attributes and some, but not all, reported aspects of neoteny. By contrast, subjects showed no preference for attributes relating to size, symmetry or well-being. In some cases, subjects' selections were not uniform and varied by perceptions of and life experiences with animals.

The findings suggest that a long-theorized human behavior—anthropomorphizing animals—can be systematically investigated and tested not only in connection to behavior, but also in regards to morphological attributes. Additionally, we show that neoteny does not consistently explain subjects' preferences; nor are other theories sufficient. The present study lays the foundation for exploring the meanings humans assign to dogs and their morphologies.

**Key words:** dog; anthropomorphism; cute response; neoteny

## 12

### Sensitivity to unequal rewards in the domestic dog: Quantity over fairness

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The history of domestic dogs – their descent from social Canids; their breeding for working cooperatively with humans – suggests that the species might have a highly developed sense of what is called "fairness" or "justice" in primate literature. In this research we ask if dogs perceive and respond to unfairness or injustice. The protocol is a revised test of inequity aversion modeled on a classic study of justice with humans (Pritchard et al., 1972) which looked at both "advantageous" and "disadvantageous" inequity; only advantageous inequity had previously been explored with dogs (Range et al., 2009). Thirty-eight subject dogs and a control dog together approached two trainers in turn: one who rewarded them equally for sitting on command, and one who rewarded them unequally – either over-rewarding or under-rewarding the control dog. After familiarization with the trainers, subjects chose which trainer to approach alone.

Subjects preferred the over-rewarding trainer over the fair trainer ( $\chi^2(1) = 10.13, P = 0.001$ ); they had no preference between the under-rewarding and the fair trainer ( $\chi^2(1) = 0.03, P = 0.86$ ). Unlike prior findings, these results suggest that subject dogs were neither averse to advantageous nor disadvantageous inequity. Dogs behaved so as to maximize quantity of reward rather than attending to the "fairness" of prior outcomes. The results have both conceptual implications – demonstrating the salience of concepts of quantity and fairness for dogs – and methodological implications, highlighting the need to be sure of the dog's interpretation of the experimental task.

**Key words:** inequity aversion; fairness; methodology

## References

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