



Contents lists available at ScienceDirect

Journal of Veterinary Behavior

journal homepage: www.journalvetbehavior.com

Editorial

Using data to inform veterinary behavior and behavioral medicine



This issue features a series of remarkable hypothesis testing and data based paper that begin to address the unmet need for understanding how behaviors develop in dogs and horses, and what behaviors mean in cows and dogs.

The paper by [Schilder et al. \(2019\)](#) should be required reading for anyone working on, training or providing professional care for dogs. Those of us who deal with canine behavioral pathology have few illusions about the potential danger involved when things go wrong. Schilder et al. examined data on dogs who attack other dogs and learned something important: dogs who engage in the most serious attacks of other dogs, which may be fatal, have, themselves, either been attacked by other dogs when you and/or missed sensitive periods of good, healthy social exposure to other dogs. We have always known that the latter was a risk. These are some of the first data showing that being the victim of another dog's aggression early in life can set some dogs down a path of serious pathological aggression. This finding means that veterinarians and veterinary behaviorist need to aggressive treat not just the aggressor in dog fights and attacks, but the victim, and further ensure that the victim's behaviors develop normally. To do so requires regular evaluations of behavior during development, and is the reason that the AAHA Canine and Feline Behavior Guidelines recommend that all dogs and cats are evaluated physically and behaviorally by their veterinarian every 3 months throughout their first 2 years of life ([Hammerle et al., 2015](#)). Physical pain is bad; mental pain is worse.

Well house-trained, hospitalized dogs often suffer from a lack of their preferred elimination schedule, locations and substrates when hospitalized. Accordingly, [Buckley and Whalley](#) asked whether an artificial turf substrate, which can be cleaned, may be preferable to concrete, which is the substrate used in many exercise areas because it can be disinfected. In this well designed study, the answer is apparently not. While the study elucidated important patterns of elimination behavior (e.g., activity level predicted elimination with higher activity being significantly associated with subsequent elimination), it's clear that dogs do not think that artificial turf meets their preferences (or, possibly, their needs).

Dogs involved in Animal Assisted Therapy (AAT) interact closely with humans in regular, intense ways. One then can wonder, as [Cavalli et al. \(2019\)](#) did, whether this affects the way they learn and interact with humans. Accordingly, Cavalli et al. compared a group of pet dogs with AAT dogs in acquisition and extinction tasks and predicted that AAT dogs would be more persistent during the extinction phase. Although the AAT dogs were more persistent in interacting picking up bones when the apparatus was empty, the

rest of the tests did not favor AAT dogs over pet dogs. Clearly, our tests may not be capturing the complexity of signaling and learning that characterizes dogs.

Anxiety disorders are common and crippling in dogs, and may result in death or relinquishment. [Kurachi and Irimajiri \(2019\)](#) asked whether attendance at training classes minimized the development of some anxiety disorders. Data were evaluated by questionnaire, which suggests that early observational data may be useful to flag key responses potentially indicative of developing problems. Here, the beneficial effects of class were primarily due to a decrease in fear and reactivity to noises and storms. While this is important, it's unlikely to be the entire story. However, noise phobias, fears and reactivities are highly comorbid conditions and may facilitate the development of other anxiety disorders.

[Hoffman et al. \(2019\)](#) examined activity in shelter and owned dogs using triaxial accelerometers. This research tool can be valuable in eliciting patterns of behavior that may not otherwise be apparent. Shelter dogs are more active than are pet dogs during the early part of the day, were more active than pet dogs during activity, and more consistent in their activity day to day. These findings are likely associated with heightened stress-related arousal in shelter dogs. It is also likely that these dog get less restorative sleep than do pet dogs, a condition associated in humans with both mental and physical illness. Activity pattern data could help us design better shelters, better care for dogs in shelters and help us diagnose behavioral concerns in pet and shelter dogs earlier and more thoroughly than we now do.

International studies on how pets interact with and are viewed by the human population are important because they show the effects of culture and other important variables on welfare and human animal bonds. [Ashuthosh et al. \(2019\)](#) examined the roles that pets in Mangalore, India may have for social support. In this study, pet owners scored higher on a survey measure of social support than did non-pet owners, but no other factors investigated (e.g., exercise and frequency of walks) was significant.

Giannetto and colleagues are deeply interested in circadian rhythms, effects on behavior and physiology and the genes involved. In [Giannetto et al. \(2019\)](#) they examined blood gene expression of the circadian clock in healthy, Italian horses. The genes found contribute to the control of if the interrelated factors: rhythm of locomotor activity, rectal temperature and cortisol. These mechanisms affect daily behavioral patterns in horses.

As has been shown to be true for horses, [Fogsgaard et al. \(2019\)](#) demonstrate that—when given a choice—cattle tell you that have one with respect to shelter design. The Aberdeen cattle

in this study of winter shelter choices preferred the rectangular over the hexagonal shelter, possibly because it allowed for sheltering as group. Social behavior can also be thermoregulatory behavior, and this paper is a good reminder that few choices are truly independent.

Few concepts deserve more attention than ones pertaining to how we recognize pain and anxiety across species. Müller *et al.* (2019), in a fascinating and well-designed study, used facial action units (AUs) to evaluate pain expression in Nellore cattle and crossbred beef cattle. Comparative studies like this allow us to hypothesize about shared and different underlying mechanisms and putative genetic bases for these mechanisms. Crossbred cattle showed greater expression of open mouth reactions in acutely painful conditions than did Nellore cattle. These findings—in addition the importance of realizing that we likely selected for different behaviors when we selected for different physical qualities in cattle—should remind us that we have incomplete knowledge and should not assume we understand the emotional states of other species, breeds, individuals without a way to measure them.

Durán *et al.* (2019) asked whether pigs would benefit from having edible objects as part of environmental enrichment given that their rooting behavior is a feeding behavior. Two classes of objects were provided in a good experimental design: cookie shaped objects, and donut shaped objects. One might postulate that because of the hole, donut shaped objects provide for more options for snout manipulation. These were food and pigs liked them both and spent considerable time sniffing, manipulating, licking and nibbling the edible enrichment, suggesting that such augmentation may be a common sense and easy addendum to the porcine enrichment repertoire.

All of these papers examined previously held assumption and asked whether they were valid for the species in front of them. Often they were not. This is how we move science and this field

forward, and these authors will provide the shoulders of giants for the next generation.

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