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Editorial

Standardization of assessments of behavior and welfare improves care



As noted by the authors of an online study of behavioral patterns of 4,114 dogs, such studies provide a time-specific framework for establishing some estimate of prevalence (proportion of cases occurring at a specific time) of behavioral concerns and for analyzing demographic and other trends that may affect such estimates (Dinwoodie et al., 2019). This study, which is largely based on dogs from the USA, but had significant international participation, invites comparison with a similar Finnish study by Tiira et al. (2016), and also has many of the same concerns since owners evaluated their own dogs. Studies have shown that the better questionnaires can be benchmarked to objective behaviors that are known to be informative, the greater the likelihood that the questionnaire indicates some meaningful trends. Here, the owners were given the important option of classifying the intensity, frequency and context of the behavior, as would occur during a clinical examination in behavioral medicine. Data were collected and managed by REDcap, an online epidemiological program in use in many human health care epidemiological programs. The prevalence of owner-reported behavioral concerns/problems in this study was 87%, with an average of 2 behavioral concerns per dog, which high, but similar to other studies like the Finnish one. For the categories that could only represent pathologies (e.g., true separation anxiety and noise phobia), the comorbidity patterns in these data mirror those in clinical data (Overall et al., 2001). That's good news because it means vets should ask clients specifically about the related behaviors so that they can intervene as early as possible. Fear/anxiety—which are not separated here despite being different—are associated with most aggression. This is not a surprise since these are drivers of most aggressions...truly malevolent dogs are rare, indeed. Here's the problem: "aggression" can be a label of a pattern and a descriptor of a set of behaviors that may not actually involve true aggression. We have no way of knowing how many of these reported concerns—especially as pertains to aggressive patterns—are true, clinical pathologies that would improve with redress, or how many of them are client complaints about dogs exhibiting undesirable, but normal behavior (e.g., barking, which clients can attribute, often incorrectly, to aggression), bratty behavior that could resolve with education and work, or behaviors that are due to lack of education/training of dogs and owners, alike. These distinctions matter from the genetic, neurobiological and behavioral/emotional viewpoints. In other words, they matter if you are interested in the biology of the dog, mechanisms of behavior and meeting the dog's needs. They may not matter in terms of whether the dog stays in the household. As we all painfully know, a normal but undesirable behavior can result in a dog's relinquishment and

death, just as a pathology can. And here is where such studies are most useful: they tell veterinarians, trainers and those charged with the care of dogs that people complain about these issues when given the chance and that we must discuss them so that the dogs needs have some hope of being addressed.

The study by González-Martínez et al. (2019) supports the concerns about the role of both client and dog education in the emergence of client behavioral complaints and true behavioral pathologies. By comparing puppies (<3 months) and juveniles (>3 months) who attended puppy classes with those who did not using a questionnaire administered a year after the classes would have ended, the authors detected patterns previously reported across a number of publications: dogs who attended classes were scored by their humans as more trainable, less fearful, less aggressive with family dogs, and less sensitive to being touched. How much of this change is what the dog learned vs. what the human learned about communicating and working with the dog? We never know, but we do know that education is far reaching and goes all ways.

We all love working dogs, but do these dogs all love to work? How stressful is their work? Silas et al. (2019) examined canine and handler stress in dogs who worked in an on-campus student stress reduction program. Interestingly, the dogs' stress was less due to work, per se, than to their handlers' level of stress. We know that we signal up and down the lead, and that we also have spillover and synchronization effects of emotion. Periodically assessing these may help all of us to do our jobs better and more humanely.

In veterinary behavioral medicine, we often lack laboratory standards against which to measure changes in biochemistry that may reflect behavioral pathology or change. For this reason, Alberghina et al. (2019) standardized a protocol to measure serum serotonin levels. Results differ from previously published, but differently obtained data, which are published here for comparison, again suggesting that standardization and replication is important, if we are to have ways of assessing meaningful neurobiological and biochemical aspects of behavioral pathological.

Castration can be a painful procedure and may generate considerable oxidative stress. Hence, Aengwanich et al. (2019) examined physiological change, pain stress, oxidative stress, and total antioxidant capacity before, during, and after castration of dogs. In the healthy, male dogs studied, although the greatest pain was immediately after castration and the dogs were stressed, they were not under anti-oxidant stress because their anti-oxidant systems was effective and responsive. Such data provide a baseline for comparison.

Handedness/laterality has become a concern across species because it reflects aspects of ontogeny in brain function. Handedness/laterality has been shown to be important in a number of situations involving dogs, although—as for humans—the majority of dogs appear to be right-pawed. The issue of how many behavioral contexts are reflected in this pattern may be important for assessing overall functional significance. For this reason, [Houpt \(2019\)](#), in small, case report study, examined sleeping positions in 12 shelter dogs. There was no preference for side of sleep when total time curled clockwise vs. counter-clockwise was compared, but dogs change sleeping positions a lot. This paper assumes that sleep is normal sleep and not the stressed or vigilant sleep we may see in situations of risk. It's entirely possible than if there is laterality involved in sleep, it may be most apparent when risk and the potential to react is involved. Not all rest and sleep may be equivalent.

In another small study, [Murarka et al. \(2019\)](#) asked whether detection dogs could be trained to detect any odorant signature of neoplasia in cell lines that would allow them to detect ovarian cancer in plasma. Ovarian cancer is tragic. It remains hidden until it is likely to kill. Any early detection system would be welcomed. This paper is an object lesson in the difficulty of training dogs to detect some odorants, and in identifying salient odorants in dynamic environments. One dog in this study provided a hopeful, but not definitive outcome: cell lines may provide odorant clues, but transfer to plasma—and accessible fluid—was not successful. Dogs can only identify volatile odorants which we have taught the dogs flag issues of importance to us. Identifying those substances in dynamic pathologies is not simple.

[Dickinson and Hoffmann \(2019\)](#) take on the difficult subject of palliative care and hospice in veterinary medicine. As someone who has lost too many dogs and will lose too many more, and who provides palliative and hospice care for their own dogs, it is rewarding to know that most euthanasias—when the time comes—are provided at home, in a loving environment, that palliative and hospice care veterinarians prefer that other pets and owners are present, and that sedation, in addition to pain medication, is the norm. Veterinarians who are not providing palliative and hospice care could learn from this model. As someone who lives with a revolving door of rescue dogs, some of whom have been very harshly treated before living with us, I am happy to see the option of having other dogs present. Rescue dogs understand death, but may worry about “absent” and “disappeared”. My dogs always know who is ill and they watch over these dogs. They deserve such choices.

Heart rate variability (HRV) has become an increasingly used measure of physiological stress or distress in response to interventions or interactions that may pose welfare concerns. Because assessment of HRV is non-invasive it is an appealing clinical and research tool. The question is, how statistically reliable are the results, especially when using portable heart rate monitors (Polar V800), common in veterinary patient assessment? [McDuffee et al. \(2019\)](#) evaluated such use in horses in a powerful test-retest design under 3 conditions common for horses: free in a box stall, confined on cross-ties, and when walking. Intraclass correlation coefficients were highest for the more controlled situations (cross ties and walk) than for the less controlled ones (free in stall), but all were sufficient to establish test-retest reliability. Accordingly, HRV as determined the Polar V800 monitor can be reliably ascertained and should be useful in determining effects of intervention on pain and stress in ways that should aid equine welfare.

The paper by [Proops et al. \(2019\)](#) should remind us that while species can look similar, different evolutionary histories may have led to different needs. In a study comparing use of a constructed shelter, natural shelters, and simply remaining in the outdoors, unsheltered, across environmental conditions, [Proops et al.](#)

determined that horses were more distressed by insects and sun than were donkeys, but donkeys sought shelter more often from wind and rain, than did horses. If we wish to meet the needs of animals in our care, we need to know what they are. Studies like this are essential.

Horses in riding programs may be ridden at different frequencies and by riders of differing sizes and abilities. While the latter 2 concerns vary widely, it is possible to measure effects of riding frequency by controlling for rider. This is exactly what [Jung et al. \(2019\)](#) have done in a study that used neutrophil:lymphocyte ratio, heart rate and serum lactic acid as markers of stress. Horses ridden once or twice daily did not differ in any of these parameter from horses as rest, but horses ridden 4 times a day show a profound shift in all parameters, indicating stress. The authors conclude that the horses require rest periods. The authors also noted that after a 1 day confinement/rest period, horses bucked more on the first ride of the day, suggesting that we may wish to see if another type/duration of rest is preferred by horses.

Because tryptophan is an amino acid that is a precursor to serotonin, numerous researchers have attempted to increase serotonin (and subsequently decrease anxiety) by increasing tryptophan in the diet. The problem is that tryptophan is a large neutral amino acid that requires and shares a carrier, and that carrier prefers pretty much all other amino acids over tryptophan. So as expected, [Marín and Larraín \(2019\)](#) found that, when investigating the behavior of steers, there were no changes between the supplemented and unsupplemented condition. In fact, the only statistically significant finding was that steers spent more time inactive at the highest level of supplementation. One has to wonder if this a biologically meaningful result. This study adds to those across species that have shown that tryptophan supplementation produces no to minimal effects on behaviors associated with stress or distress.

Chickens are a major food source, world-wide, and are especially valued in economically and environmentally challenging situations. The Harmattan in West Africa is a cold, dry, dusty wind that blows for long periods. Such environmental stressors have been known to adversely affect growth and productivity of chickens. [Zakari et al. \(2019\)](#), in a large (these are chickens—large numbers are normal), well designed experiment, asked whether a commercially available probiotic could ameliorate stress induced by the Harmattan environmental conditions. The addition of the probiotic decreased fear as assessed by duration of tonic immobility, and vigilance behaviors, and so improved the welfare of the birds while improving their productivity.

It should be noted that with the exception of 1 study ([Dinwoodie](#)) in this issue, all of the studies involve hands-on evaluation of animals, their behavior and their physiology, or veterinary decisions ([Dickinson and Hoffman](#)). Such studies remove results from the realm of opinions, and establish a data base against which future studies can be compared. Such data bases establish the legitimacy of a field and need expansion.

For those of you interested in canine behavior and genetics and standardized evaluation of dogs, don't miss the 2019 International Working Dog Conference (IWDC) to be held 1–6, September 2019 in Stockholm, Sweden (www.iwdba.org). This meeting brings together a diverse group of those who do research on or pertaining to working dogs and those who use or manage such dogs. The latter group is, itself, quite variable ranging from service dogs, to patrol dogs and dogs that detect explosives, weapons, drugs, cancer, endangered species and pretty much any other volatile compound that emanates from a substance that matters to human health, commerce and safety. The meeting has a novel configuration of workshops, roundtable/audience discussions led by experts in the field, and contributed research papers. Because the meeting is in Sweden, a place with a rich working dog ethology tradition, the

main focus of the meeting is on temperament and behavioral assessments of working dogs, and the genetics underlying these facets and performance outcomes. Some of the best people in the world in these fields are on the schedule. The website contains the schedule and information about speakers and their topics.

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