Editorial

Unmet needs in veterinary behavior and behavioral medicine: The case for more scientific rigor

The *Journal of Veterinary Behavior: Clinical Application and Research* is the only journal within the broad fields of veterinary medicine and animal behavior that has as a special focus veterinary behavior and behavioral medicine. It is the only journal with a dual focus on both the clinical aspects of behavioral and welfare issues (e.g., wellness, mental health, and both problematic and pathologic behaviors) and the relevance of the basic sciences (e.g., evolutionary biology, ethology, neurobiology, neurobehavioral genetics, and so forth). So it is fitting that our first paper in this issue is about veterinarians whose focus is behavioral medicine. Ballantyne and Buller (2015) used an internet questionnaire to assay the responses of an international group of specialists in veterinary behavioral medicine, residents in veterinary behavioral medicine, and veterinarians who were not specialists but who focused on behavioral medicine cases to learn about training and career satisfaction. Interestingly, although specialists felt more comfortable discussing clinical issues with clients than did nonspecialist practitioners, none of the factors surveyed (e.g., date of graduation, training), alone, was responsible for this. In fact, although those practicing behavioral medicine felt spread thin, their complaints were no different than recent studies have shown for veterinarians, in general, although some of the patterns of responses bear closer study.

The irony, and the concern for the field here, is that within the past 15 years the number of programs in veterinary behavioral medicine has decreased at veterinary schools in the US. And while Ballantyne and Buller (2015) note that there are only 8 residencies in veterinary schools in the US, many of these are unavailable or only periodically available because of lack of funding. Two of the oldest clinical university programs in behavioral medicine in the US ceased to exist this year: the University of Minnesota, College of Veterinary Medicine and the University of Georgia, College of Veterinary Medicine both terminated their clinical and residency programs in 2015. All the tenured positions in the field in the US could be swept away soon in a wave of retirements. This is at a time when many specialists in the field in the US who are in private specialty practice have appointments scheduled 4-6 months in advance. The article by Ballantyne and Buller, combined with these data, suggests that there is a profound mismatch among needs, understanding, and training. One solution could be for industry and institutions of higher education to invest in more and more rigorous training in the field, as is done in so many other specialities, and has been done for neuroscience and psychiatry in human medicine. The key field that ties together welfare, veterinary medicine, and basic science for all animals is behavior. This journal was created, in part, to address this unmet need. We must do more.

The contribution by Landsberg et al. (2015) continues to build on the noise-induced anxiety or fear model that the author's group has developed for laboratory beagles to investigate the potential efficacy of an array of compounds that may potentially alleviate some aspect of anxiety. The compound of interest in this study is a fish hydrolysate from cod and mackerel that is postulated to have effects on the hypothalamic-pituitary-adrenal axis, sympathetic activity, and levels of gamma amino butyric acid in specific brain regions. In a placebo-controlled, blinded study that used a match-group, cohort design, outcome measures included scored or scaled behavioral assays and cortisol. The results were not straight forward. A major finding of this study was that there is enormous underlying variability in individual differences in anxiety or fear responses of the dogs studied. This result should not surprise anyone who has tried to categorize patients or pet/family dogs. One concern with such models that is not addressed in this paper is that the behavior of a laboratory model may not be equivalent to the truly pathologic response of interest (and "anxiety" and "fear" are broad diagnostic categories). Without objective data, such arguments are hard to make and few such studies exist, but the range from truly pathologic to "normal" variants of behavior is broad and could be an important contributor to the amount of baseline variation. We also should remember that laboratory dogs, especially laboratory beagles, may not define the range of normal, but that they are interesting for themselves, since these beagles are the most commonly used laboratory canines. As interest in translational models continues to grow, attention will have to be paid to defining and measuring the underlying conditions and study populations and to investing in standardized outcome measures that can be compared across populations, conditions, and interventions.

With respect to the topic of standardization, Arhant and colleagues (2015) have taken a unique approach in their attempt to measure the welfare of cats in shelters. They sought to develop animal-based parameters to use in a surveillance setting, given the a priori requirements that the measures are stable over time and reproducible by different raters. Did they succeed? Interestingly, their 2 robust parameters were those used evaluations of physical state, but their discussion on defining and recording information on all parameters is not to be ignored.

In a truly delightful and incredibly creative paper, Tagaki et al. (2015) ask whether cats use sound as a referent, and whether context and movement matter. In what is likely to be one of a series of papers about causal-logical rule determination in cats, the authors use both pet and cat café cats to argue that the causal-logical rule is essential to cats in their evolutionary history as sit-and-wait predators. The discussion of the experimental design and why some results may not have been as predicted is sensitive to phylogeny of domestic cats, and is worth reading.

Because behavioral measures, alone, can be so nonspecific, there is interest in finding readily measured physiological issues that might be more specific. Unfortunately, heart rate changes may not be any more contextually specific than pacing, but heart rate variability, which is considered a measure of sympathetic vagal activity in the autonomic nervous system has received lots of attention as a potential contributor to measures of long- and short-term pain, mental activity, stress, and response to social contact. As with most measures, the complex patterns of change may be most informative, but once you have complex measures that may covary, they must be accurately measured or you risk studying an artifact. This is exactly the point Essner et al. (2015) explored in their study of validity and reliability of Polar 2 RS800CX monitors when compared with simultaneously recorded ECG measuring time- and frequency-based short term heart rate variability parameters in dogs when standing and stationary. Almost most of the parameters assessed have high validity and reliability between measures, but for 2 of the 7 parameters there was a significant difference in measurements from the 2 sources. The factors potentially contributing to these differences—including the inherent, large within-group variation—should suggest ways that we can better assay physiological aspects of behavioral concerns in ways that will allow us to develop both informative and relatively standardized measures of suites of behaviors, under controlled conditions. This is far from what we need in the "real world" but this is how new technologies are born.

When considering performance and working outcomes, one of the important questions—regardless of species—is at what age can you best assess the peak effects of training and experience? Lewczuk (2015) asked this question for Warmblood horses competing under the auspices of the Fédération Equestrian International in Poland. The Fédération Equestrian International allows horses to begin competing at 4 years of age. Using data from performance records for 489 horses, the authors conducted an analysis of variance incorporating age, year, and training effects. There are a couple of surprises in this study. Although horses seem to do best at 5 years, there is a relatively small difference in performance between 3 and 6 year old horses. Also, the findings from the "temperament" component of the test evaluations suggest that these tests may not be measuring what they say they are. If such tests are to be helpful for training or choosing careers—regardless of species—they must be valid, repeatable, and reliable, and that seems to be a problem in every species.

Rein tension in horses has relevance for both signaling between horse and rider and poor welfare when such signals are misused or mismatched. What has been missing in much of the discussion about rein tension is good measurements on rein tensions over a range of standing riding scenarios. Eisersiö et al. (2015) present data to redress this concern. The authors studied between-gait and between-exercise variation in rein tension, controlling for riders and horses within riders, the between-rein variation and the general within-gait or exercise variation, during full riding sessions. The authors' data show the extent to which standardization of measures is important and that the most important factors to consider may be gait of travel, the rider's position in the saddle, the ridden exercise performed, the educational level of horse, rider and

team, and some handedness factors. It will be interesting to see whether such measures become routine in welfare assessments, or in evaluations of schooling and performance.

Total locomotor activity (TLA) is one measure used to establish diurnal behaviors which can be affected by endogenous or exogenous factors. In a paper that has practical applications for those who work with mares and foals, Giannetto et al. (2015) measured TLA for 15 mares in one breeding center for a week prior to the anticipated foaling date, through 3 days after foaling. Because activity was measured every 5 minutes using an Actiwatch, the authors have a large amount of data with which to determine rhythmic parameters. Changes is patterns can only be evaluated if the patterns are documented, and the importance of such detailed documentation is apparent here. During late gestation and early lactation mares exhibited changes in TLA. In the 2 days before the foal's birth the mares exhibit a significant increase in activity. Such data can help both professionals and owners to monitor the health of mare and foal. Normal nursing did not affect TLA in mares, but damped its amplitude and robustness, again providing a useful measure for those charged with the care of the horses. Interestingly, by the second day of life, the foals appeared to display their own endogenous TLA rhythm. Such behavioral data can help in monitoring foal health, also.

The Point-Counterpoint by Westlund (2015) is sure to generate discussion as we begin to change the way we practice veterinary medicine to focus on understanding and addressing behavior as a core competency so that patient's behavioral needs are met (Hammerle et al., 2015). In an exhaustive review of the literature, Westlund challenges the conventional wisdom that cats and dogs who may undergo any time of sedative, anesthetic, or invasive procedure should not be fed or given treats. Using the logic of a cost-benefit analysis, Westlund advocates—convincingly—for considering the mental health and stress level of the patient, and in doing so, makes an excellent case for the concomitant effects of on the mental health and stress level of the veterinary staff.

Finally, this issue contains the abstracts from the Canine Behaviour and Genetics Meeting that was held in London, UK, 26-28 June 2015 (caninebehaviourandgenetics.org/) (Overall, 2015). This meeting was funded largely by the US Department of Defense, Army Research Office, because they perceived a need to improve the quality of data available that pertain to working dogs, in particular, and dogs in general as pertains to mechanisms of behavior. This unique meeting brought together researchers from different fields in a deliberate attempt to remove them from their comfort zones and have them hear about topics they would not otherwise consider. The hope is that collaborations will result. Did it work? We'll know if we check the literature in a few years. In the meantime, a future issue of the *Journal of Veterinary Behavior: Clinical Applications and Research* will publish all the articles from this meeting.

Meanwhile, those of you who are planning for meetings to attend in the summer of 2016 may wish to consider the 5th International Canine Science Forum (CSF) in Padova, Italy, which will take place the 28th June through 1 July 2016. For more information go to: www.csf2016.com.

Enjoy!

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