Editorial

Better experiments lead to better data and potentially better welfare

The paper by Chutter et al. (2019) should be welcome for those who practice veterinary behavioral medicine. While fluoxetine has a license as Reconcile® and a label in many countries for the treatment of separation anxiety, it is frequently used extra-label for a range of anxiety-related conditions. And while the label lists the dosage as 1-2 mg/kg by mouth every 24 hours on the basis of the original efficacy studies (Landsberg et al., 2008; Simpson et al., 2007), anecdotal advice is now frequently given to use dosages as high as 4 mg/kg daily. Fluoxetine is a selective serotonin retuptake inhibitor (SSRIs) that favors the 5-HT$_1$A subtype receptor, but that affects a wide range of receptor subtypes to some extent. The adverse effects of SSRIs include a potentially fatal serotonin syndrome that appears extraordinarily rare in both humans and dogs at clinical dosages, but what is often missed in the risk discussion is that increased serotonin need not cause a fatal syndrome to be problematic. Serotonin is an 'activating' neurochemical, and may stimulate increased activity and heart rate that can become problematic for patients with anxiety since this effect worsens the perception (in humans) and appearance (in dogs and humans) of the anxiety. While the emphasis of Chutter et al. (2019) is not adverse events, the dogs who were reported by clients to have improved the most across diagnoses we treated with dosages of 0.5–1.49 mg/kg every 24 hours. No previous studies have asked questions about outcome in the way this retrospective study did, so these results suggest that larger, prospective studies should examine efficacy and true changes in behavior across diagnoses.

Loving the way a dog looks and makes you feel may be completely different from understanding that certain morphologies cause real medical problems for dogs in a way that make you boycott the breed. And, therein lies the problem, as Steinert et al. (2019) show so clearly. In their survey study, people appreciated the burden of brachycephaly and noted that they did not think the breed standards favored the health of the dogs….but they still had and loved them. This is surprising given the location (Germany) and that there is legislation in Germany that defines 'agony breeding', with which the participants were familiar. Since a number of veterinary and welfare initiatives—which are well reviewed here—have emphasized health concerns associated with breeding for certain conformations, as long as standards are weak and emotional responses rule—no matter how much love is involved—we will do harm to dogs.

The pilot study by Giudice et al. (2019) on 10 dogs with lumbosacral stenosis suggests that gabapentin may relieve related pain better than does tramadol. A larger, blinded study would be welcome, especially since such a study would have the potential to define both specific behavioral change concordant with degree of damage as ascertained by imaging.

Clarke et al. (2019) asked what effect—if any—breed group, as ascertained by the results of an online study of ∼ 8,000 dogs evaluated by owners for 3 simple cognitive tasks, would have on the performance of these tasks. While breeds may be pools of canalized genetic variation, most of this canalization in the past 150 years has gone towards how they look, not how they behave, as a whole. Breed groups are hugely heterogeneous behaviorally, in part, because their people are also. Even breed groups that have dogs who may work as their constituents, have enormous innate variability in basic behavioral parameters, something that has been noted by those who test working dogs. In fact, Scott and Fuller (1965) noted that across the 5 breeds they studied in depth, the variation within and between litters exceed that across breeds for such parameters. Given this, one would have been hard pressed to be surprised by the findings of Clarke et al. that breed classifications do not shed much light on behavior.

Benedetti et al. (2019) present some preliminary results on the beneficial effect of homotaurine supplementation on the rate of canine aging. As with all such interventional studies, results may depend on the health and cognitive status of the patients, their prior stimulatory and cognitive environments, genetics, diet history, and so on, but we need to explore all such options. Brain aging is the quintessential One-Medicine/One-Health issue.

Dog bites are an international concern. The more demographic data from different locales available, the better our chances of collaborative efforts in prevention that increase efficacy of such endeavors. As with most other epidemiology studies, most people knew the dog who bit them and most bites are concentrated in the 5-9 year old age group for human receivers of the bites. These data strongly suggest that the solution to decreasing dog bites to humans involves changing and monitoring human behavior.

Cognitive bias tests are increasingly used to measure affective states and their effects on functional ability across a wide range of species. Gruen et al. (2019) note that the results could attributable to effects of spatial learning/memory (which, indeed, can also be affected by affective states, behavioral pathology, et cetera), especially when location is used as a cue. Accordingly, they compared 16 Labrador retrievers on the delayed non-matching to position (DNMP) test—a standardized test in the aging canine mechanized test paradigm—to their performance on a cognitive bias test. The results suggest that spatial learning may be involved in the latter, which may, in fact, be one mechanism by which the bias occurs.

However, it should be noted, that only 9 of these Labradors could reach the laboratory criteria for the DNMP test. This result raises concerns across tests, including replicability and whether we are testing what we think we are.

While involving a single case, the report by Dockx et al. (2019) strongly suggests that accelerated high-frequency repetitive transcranial magnetic stimulation can alter behavior and suggests mechanisms for these changes. The power in this study is that quantitative measure of behavioral change for treatment are usually lacking, and mechanism is assumed, not measured. Here, we have a treatment that is an investigational tool. I would hope for a larger study.

Requirements for systematic scoping reviews, compared with basic or critical reviews, are stringent, and largely intended for larger data bases than are traditional in veterinary behavior or behavioral medicine. Here, Hall et al. (2019) were able to compare 5 studies with sufficient data to ask the question "what is known about the specific risk from child-dog interactions to assistance, therapy and pet dog quality of life?". This is a question much on people's minds as the roles for assistance dogs expand. It's remarkable to me that we did not collect these data for the most widely and longest used group of assistance dogs, those for the blind, and thereby deprived ourselves of a rich data set from one of the most intensely worked groups of dogs. Unprovoked, un-asked for and undesired attention (from the dog's viewpoint) and unpredictability appear to pose the largest risks to canine welfare at this stage of research. We work and live with dogs, and in all that entails, and with all the individual expressions of concern, we must meet dogs' needs.

Interestingly, similar issues important for the welfare of assistance dogs matter for dog who bite. Barrios et al. (2019) examined animal bite data in Chile. As with other such studies across countries, most animal bites are due to dogs, the overwhelming majority of dogs are owned and known, and most bites are to children 5-9 years. Such data suggest that the needs of the dogs that bite are not being met and that when when 2 vulnerable groups of individuals from 2 species who may not reach each others' signals well collide - life can be problematic. However, as with assistance dogs, by understanding signals and risk, we have the choice of humanely mitigating them.

In addition to highlighting careless human verbal vernacular, Navas González et al. (2019) shine a light on the cognitive abilities of one group of animals with whom we live and work, but seldom consider: donkeys. By using rigorous Bayesean methods to compare human and donkey performance on analogous cognitive tests, the authors may have exposed cognitive patterns shared by social states…something we too seldom consider in our egocentric approaches. Interesting reading.

Mazzatenta et al. (2019) further explore early development of social behavior in an endangered donkey breed, the Martina Franca donkey. Because donkeys differ from horses in some social behaviors (notably play) such data are needed as we may make assumptions about early social development that are not warranted. And, because more donkeys are being used in animal assisted therapy, the more we know, as earlier discussed, the better we can meet needs.

As demonstrated by Zanin et al. (2019), studies on welfare effects of interventions or management procedures can be difficult. Their intent was to examine expected welfare effects of dietary changes involved in drying off dairy cattle. Here, data were so variable, that firm conclusions were not possible.

Rahman et al. (2019) examined the effect of concentrate level in diets of bulls. Concentrated diets have been known to alter eating and rumination time and lead to abnormal behaviors. Chewing activity was highest and occupied the longest intervals in bulls fed the highest concentrate diet. Such changes may be impediments to the best possible welfare.

Pulido et al. (2019) continue the excellent work from the Miranda-de la Lama group on the effects of transport and those doing the transporting on sheep. In this paper, they surveyed hauliers about how the pre-slaughter transport chain can affect sheep welfare and broader One-Welfare implications. The results are enlightening and reading is recommended.

The two papers by De et al. (2019a,b) show the power of good experimental design. By providing bedding, post-shearing stress was reduced as indicated by increased lying time and decrease cortisol, a reflection of the physiological response to the stressor. Introgression of a fecundity gene may not be benign, and so could counteract the reason for introducing the gene—increase births. In this study, sheep with the introgressed gene were shown through a rigorous thermoregulatory study to use the same adaptive strategies to modulate heat load and non-introgressed sheep, suggesting that—at least in this respect—risk is small.

Like sheep, rabbits feed many parts of the world. _Ad libitum_ feeding during pregnancy in does carries with it the risk of detrimental effects to embryonic programming. Simitzis et al. (2019) assessed the behavior and physiology of young rabbits to test for such embryonic programming effects. Interestingly, rabbits from over-nourished does, explored and moved less than those from does who could not 'over-nourish'. This finding shows how important hidden aspects of maternal effects can be to expression of behaviors. Further research into the mechanisms of these behaviors should be interesting.

All of these papers contain data that challenge previously held beliefs. Such challenges move knowledge forward. Our challenge, in this field, is to use such knowledge for the good of those with whom we live and whom we study.

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References

Barrios, C.L., Vidal, M., Parra, A., Valladares, C., González, C., Pavletic, C., 2019. Epidemiological characterization of bites: A retrospective study of dog bites to humans in Chile during 2009. J. Vet. Behav.: Clin. Appl. Res. 33, 31–37.

Benedetti, R., Marchegiani, A., Tambella, A.A., Fruganti, A., Serri, E., Malfatti, A., Spaterna, A., 2019. Effects of chronic supplementation of homotaurine on cognitive processes and spatial cognition in aged dogs: Preliminary results. J. Vet. Behav.: Clin. Appl. Res. 33, 90–95.

Chutter, M., Perry, P., Houpt, K., 2019. Efficacy of fluoxetine for canine behavioral disorders. J. Vet. Behav.: Clin. Appl. Res. 33, 54–58.

Clarke, T., Mills, D., Cooper, J., 2019. Exploring the utility of traditional breed group classification as an explanation of problem-solving behavior of the domestic dog (_Canis familiaris_). J. Vet. Behav.: Clin. Appl. Res. 33, 103–107.

De, K., Kumar, D., Mohapatra, A., Saxena, V.K., 2019a. Effect of bedding for reducing the postshearing stress in sheep. J. Vet. Behav.: Clin. Appl. Res. 33, 27–30.

De, K., Saxena, V.K., Kumar, D., Mohapatra, A., Balagnur, K., Naqvi, S.M.K., 2019b. Oscillatory thermo-regulatory behavior of fecundity-geneintrogressed sheep in the hot semi-arid region. J. Vet. Behav.: Clin. Appl. Res. 33, 75–80.

Dockx, R., Baeken, C., De Bundel, D., Saunders, J.H., Van Eeckhaut, A., Peremans, K., 2019. Accelerated high-frequency repetitive transcranial magnetic stimulation positively influences the behavior, monoaminergic system, and cerebral perfusion in anxious aggressive dogs: A case study. J. Vet. Behav.: Clin. Appl. Res. 33, 108–113.

Giudice, E., Crinò, C., Barillaro, G., Crupi, R., Macrì, F., Viganò, F., Di Pietro, S., 2019. Clinical findings in degenerative lumbosacral stenosis in ten dogs: A pilot study on the analgesic activity of tramadol and gabapentin. J. Vet. Behav.: Clin. Appl. Res. 33, 7–15.

Gruen, M.E., Foster, M.L., Lazarowski, L., Jeffries, A., Sherman, B.L., Dorman, D.C., 2019. Does the cognitive bias test in dogs depend on spatial learning? J. Vet. Behav.: Clin. Appl. Res. 33, 1–6.

Hall, S.S., Finka, L., Mills, D.S., 2019. A systematic scoping review: What is the risk from child-dog interactions to dog's quality of life? J. Vet. Behav.: Clin. Appl. Res. 33, 16–26.

Landsberg, G.M., Melese, P., Sherman, B.L., Neilson, J.C., Zimmerman, A., Clarke, T.P., 2008. Effectiveness of fluoxetine chewable tablets in the treatment of canine separation anxiety. J. Vet. Behav.: Clin. Appl. Res. 3, 12–19.

Mazzatenta, A., Veronesi, M.C., Vignola, G., Ponzio, P., Carluccio, A., De Amicis, I., 2019. Behavior of Martina Franca donkey breed jenny-and-foal dyad in the neonatal period. J. Vet. Behav.: Clin. Appl. Res. 33, 81–89.

Navas González, F.J., Jordana Vidal, J., León Jurado, J.M., McLean, A.K., Delgado Bermejo, J.V., 2019. Dumb or smart asses? Donkey's (*Equus asinus*) cognitive capabilities share the heritability and variation patterns of human's (*Homo sapiens*) cognitive capabilities. J. Vet. Behav.: Clin. Appl. Res. 33, 63–74.

Pulido, M.A., Estévez-Moreno, L.X., Villarroel, M., Mariezcurrena-Berasain, M., Miranda-de la Lama, G.C., 2019. Transporters knowledge toward preslaughter logistic chain and occupational risks in Mexico: An integrative view with implications on sheep welfare. J. Vet. Behav.: Clin. Appl. Res. 33, 114–120.

Rahman, M.A.U., Qi, X.C., Binghai, C., 2019. Nutrient intake, feeding patterns, and abnormal behavior of growing bulls fed different concentrate levels and a single fiber source (corn stover silage). J. Vet. Behav.: Clin. Appl. Res. 33, 46–53.

Scott, J.P., Fuller, J.L., 1965. Genetics and the Social Behavior of the Dog. University of Chicago Press, Chicago.

Simitzis, P., Kiriakopoulos, A., Symeon, G., Goliomytis, M., Kominakis, A., Bizelis, J., Chadio, S., Pagonopoulou, O., Deligeorgis, S., 2019. Effect of prenatal overfeeding on the growth performance and postweaning behavioral parameters in rabbits. J. Vet. Behav.: Clin. Appl. Res. 33, 38–45.

Simpson, B.S., Landsberg, G.M., Reisner, I.R., Ciribassi, I.R., Horwitz, D., Houp, K.A., Kroll, T.L., Luescher, A., Moffat, K.S., Douglass, G., Robertson-Plouch, C., Veenhuizen, M.F., Zimmerman, A., Clark, T.P., 2007. Effects of Reconcile (fluoxetine) chewable tablets plus behaviour management for canine separation anxiety. Vet. Therapeutics 8, 18–31.

Steinert, K., Kuhne, F., Kramer, M., Hackbarth, H., 2019. People's perception of brachycephalic breeds and breed-related welfare problems in Germany. J. Vet. Behav.: Clin. Appl. Res. 33, 96–102.

Zanin, E., Zobel, G., Cestari, A.A., Fregonesi, J.A., 2019. Intake, milk yield, and lying behavior of dairy cows fed on two hay diets at dry-off: A case study in Brazil. J. Vet. Behav.: Clin. Appl. Res. 33, 59–62.