



Contents lists available at ScienceDirect

Journal of Veterinary Behavior

journal homepage: www.journalvetbehavior.com

Editorial

Equitation Science in Practice: how collaboration, communication and change can improve equine welfare



Equitation Science is unmistakably coming of age as an independent scientific discipline. Over the past decade, Equitation Science has contributed substantially to the determination of which training methods and equipment may promote ethical and sustainable practice. Equitation Science research is also increasingly focusing on the identification and use of animal-based indicators of welfare rather than those that are solely resource-based (Randle, 2019). That said however, researchers and practitioners agree that “we still don’t know what we don’t know” and as Waran and Randle (2019) state “more importantly, what we need to know to improve equine welfare”. This special issue contains the abstracts from the 13th international conference of the International Society for Equitation Science (ISES) themed *Equitation Science in Practice: Collaboration, Communication and Change*, and a broad range of full papers from the conference and after.

Equitation research is widely published in journals spanning multiple disciplines and as importantly in the lay press. It frequently makes news headlines and is widely discussed on social media. Given its extensive international reach touching most equestrian disciplines in one way or another, the findings of Equitation Science research must be comprehensive, repeatable and reliable if they are to be adopted by those in the equine industry (Randle and Waran, 2017). In reality, it can be difficult to have an immediate effect on practice, due to other industry drivers that not only affect horses directly, but also impose constraints on those managing them.

In their review of practices associated with determining the fitness for travel of horses destined for slaughter, Vermeulen et al. (2019) highlighted the fact that the industry’s preference for live horses versus carcasses remains, despite concerns over welfare issues associated with live transport. The lack of consistency between countries in terms of legislation governing slaughter-horse practice and therefore to any approach to safeguarding horse welfare during transport was also reported, and exists in all aspects of horse management and care.

Equitation Scientists have been responsible for generating data that have resulted in questioning both the efficacy and ethical use of specific types of equestrian equipment, most notably, nosebands and whips. Randle et al. (2017) noted that this kind of research has become much easier to conduct due to the greater accessibility of data collection equipment and technology. Access to better technology can also lead to an abundance of data, often collected opportunistically, that become unwieldy to manage and are not used effectively to answer hypothesis driven questions. There are now a plethora of horse- equipment related publications, many of which

focus on a single independent variable, while failing to consider or analyse additional potential contributing factors. This pattern has led to a marked increase in the number of systematic reviews being published within Equitation Science. Indeed, in their review of rein tension studies Dumbell et al. (2019) highlighted the multifactorial nature of contributions to rein tension, broadly categorised into horse-, human- and equipment- related factors. Once again the lack of standardized measurement protocols and reporting methods was emphasized. Although it could be argued that this absence is to be expected given the relative newness of Equitation Science research, steps should be taken to continue Pierard et al.’s (2015) work on measurement protocols, focussing on popular areas of research such as tack-related pressures, gait analysis and rider impacts.

The use of opportunistic data collection is not necessarily all bad. In fact, if well managed, the use of archived data and resources stored for other reasons may be extremely valuable, but only if the measurement protocols used are clearly described and consistent. Crago et al. (2019) opportunistically examined radiographs of equine nasal bones at the usual site of nosebands, but found it difficult to reach definitive conclusions due to the different radiographical methods used, lack of agreement between professionals scrutinizing the sample radiographs and lack of baseline data notably for what constitutes ‘normal’. The lack of normative data still plagues Equitation Science research, so perhaps it is time to prioritize generating these?

The vast majority of Equitation Science research depends at least in part on observations of horse behavior. However, if we are to seriously address what may constitute useful horse-based welfare indicators (see Waran and Randle, 2017 and Hall et al., 2018), researchers need to move away from describing behaviors according to predetermined categories, as this leads to the use of erroneous notions such as ‘dominance hierarchies’ and ‘leadership’, and masks useful information arising from subtleties in behavior, an issue identified by Kiley-Worthington in 1997, but very little addressed since. These subtle details about behavior can only help with the identification and assessment of useful animal-based indicators (Hall et al., 2018). While ethograms exist for horses in the ‘natural’ context there is still much work to be done to produce a definitive ethogram for horse behavior during equitation (Hall et al., 2017). Pierard et al. (2019a) emphasize the need to define behavioral units to ensure consistency and ease of use by researchers and practitioners alike. In their extensive list of behaviors that could form part of an equitation ethogram the authors included all behaviors that could potentially be exhibited by horses

and avoided prescriptive classification into 'good/bad' or 'normal/abnormal'. The authors confirmed that behavioral scoring can be highly reliable and that overall researchers and practitioners do not differ in their ability to behavior-score simple behavior (video clips containing only one or two behaviors). Interestingly however, variability in scoring ability differed more when video clips contained more than two behaviors in combination. While the development of an ethogram for the horse kept in domestic contexts is plausible, it is still in its infancy, and further refinement of behavioral definitions is needed.

Following global interest in the outcomes and application of Equitation Science research, there is also a resurgence of interest in non-equitation related aspects of horse management, as was seen at the 2018 ISES conference. The housing of horses is of interest. Some countries have now legislated aspects such as minimum turn-out times. Group housing is increasingly being used to reduce the time horses spend in isolation and to increase opportunities for social contact. However a major barrier to change in practice is horse owner's belief that moving away from housing the horse individually will lead to increased likelihood of injury. [Pierard et al. \(2019b\)](#) found that the social interactions between group housed horses are complex and not all about aggression and access to resources. Furthermore, interactions could not be characterised by a single measure and were determined by a complicated and changing combination of factors including stocking density, presence/absence of particular individuals, horse age and horse sex.

With increased interest in behavior, individual horse attributes periodically receive research attention and may be believed to be 'inherent'. There is currently a resurgence of interest in horse 'personality', but results of animal personality studies often result in confusing and even conflicting findings, primarily due to the lack of explanation of the relationship between temperament and personality and its resulting influence on performance/fitness for purpose ([Randle, 2015](#)). Personality is an outcome of temperament (considered by some an innate response to fearful stimuli) and experience, of which learning and training is an important part. Interestingly many tests used to assess 'personality' are in fact based on tests originally designed to assess temperament using novel stimuli/fear inducing situations.

There is also growing awareness of the importance of the horse-human relationship within domestic horse use, and this is most frequently characterised by its behavioral nature. A positive horse-human interaction is preferable, yet this is frequently not the case. [Ali et al. \(2019\)](#) examined the relationship between working mules and their handlers in Egyptian brick kilns, focusing on the occurrence of aggression. Analysis of behavior data obtained from over 350 mules working at 50 kilns indicated that aggressive interactions exhibited by mules, did not reflect an 'inherent tendency', but in all likelihood were due to aversive handling.

Temperament is used as an important selection criterion for a wide range of working horses, however tests need to be implemented carefully. [Pierard et al. \(2019c\)](#) investigated the effects of multiple testing during tests of horse individuality designed to assess suitability for recruitment into the Belgian police force, using a range of test environments. They found whilst repeated testing did not influence the behavior exhibited during individual tests, the nature of the activity that preceded tests in a covered arena did. As with many other investigations of domestic horse behavior the short- and long-term impacts of arousal caused by defined and undefined stressors, need to be taken into account.

Training is an important part of individual horse experience and methods used vary from the unquestioned often traditional, to popularised Natural Horsemanship methods. Extensive marketing has

led to often unquestioned adoption of the latter and has led to a marked increase in the use of training environments such as round pens, especially for foundation training, with relatively little regard to the effects of using these on individual horse arousal. There is a fine line between arousal levels necessary for learning to take place and levels that lead to anxiety and stress often characterised by avoidance and escape behaviors that put both the horse and human at risk. [Fenner et al. \(2019a\)](#) emphasized the need to apply scientific, evidence-based methods when using round pen, lunging and high-speed liberty work in training. Effective training relies on a clear Stimulus-Response-Reinforcement framework and negative reinforcement is often used to 'reward' the individual for responding correctly. [Fenner et al. \(2019b\)](#) found that behavioral, demographic (e.g., breed) and environmental (e.g., being in work) factors, all thought to influence the success of the use of negative reinforcement, need to be carefully managed in order to optimize training outcomes. Again, the effect of individual horse arousal level on training outcome was highlighted; horses who become more aroused during handling were 'more motivated' to engage in and complete the required task.

The horse's training environment is important and at times may include unfamiliar humans. Audience effects on captive animal behavior are well documented, but little data are available for horses. [Janczarek et al.'s \(2019\)](#) analysis of leisure horse HRV and cortisol indicated that the presence of an audience resulted in increased arousal related behavioral reactions when ridden in an indoor arena, especially when being worked in faster gaits.

One of the primary goals of Equitation Science is to ensure that research outcomes have direct application to the equine industry. [Padalino et al. \(2019\)](#) demonstrated that the use of 'summer' rugs is not a suitable substitute for the provision of shade when ambient temperatures exceed 25°C using a combination of behavioral and physiological measures. [King et al. \(2019\)](#) report on the success of early training of young Thoroughbred horses (i.e., those less than 8 weeks of age) when the ISES 10 Training Principles are applied ([ISES, 2018](#)) practically within the horse racing industry. These young horses are reported to be better able to cope with the preparation for the next stages of their career, have higher chances of making it to the racetrack and an increased likelihood of a career after racing. Clearly the application of an evidence-based training approach can result in better welfare throughout the horse's working life.

Communication is key to progress being made within the equine industry and also between those who exist within it. The subtleties of communication are lost on neither horse nor human. [Ladewig \(2019\)](#) reminds us that the smallest of intention movements made by humans as interactors with horses are crucially important as they are perceived as signals/stimuli and acted upon accordingly by the horse. Unexplained, and even unrequired behaviors exhibited by horses, could, in fact, be a trained response. It is widely agreed that the consistent use of signals and release from pressure is more likely to result in training success, however, we are likely to still need to have better control over the signals we unwittingly emit.

Equitation Science is not just pure 'science'. There is clearly a place for social science within our explorations of the relationship between humans and domestic horses ([Randle, 2017](#)). As with any discipline this needs to be well-managed. In her examination of horse owner's ability to assess if the behavioral and social needs of their horses are met, [Thompson \(2019\)](#) demonstrated the value of a mixed-methods approach. Despite the value that practitioners clearly place on research-based information, they still tend to base their explanations and conclusions on 'natural' and 'ethical' based premises. Similarly, [Hötzel et al. \(2019\)](#) reported that although there is a sound lay knowledge base available to help Brazilian horse owners involved in daily management of horses to change

behaviors, anthropomorphic explanations of horse behavior describing how horses may 'feel' are frequently used to improve the explanation and increase engagement to promote change in practice. Both Thompson's and Hötzel et al.'s emphasis of the value of anthropomorphism aligns with [Lea and Kiley-Worthington's \(1996\)](#) proposal that conditional anthropomorphism (also known as common sense psychology or folk psychology) may be useful.

This editorial is written by authors who are both academics and practitioners, and have been involved with ISES since its beginning and are therefore well-placed to reflect on its journey since its formal inception in 2007. At the present time Equitation Science research needs to continue to increase its reach globally, working in a wide range of areas as demonstrated by the breadth of papers included in this issue. Equitation Science researchers also need to bring about changes to practice that is right under their noses. This can only be achieved if Equitation Scientists can secure equine industry engagement at both the individual and organisational levels, by continuing to hone their collaboration and communication skills. Given the fact that change inevitably causes discomfort, it is up to Equitation Scientists to help make sure that the reticence and resistance to change is managed in a positive and productive way within the Equine Industry, in order to safeguard equine welfare.

Hayley Randle

School of Animal and Veterinary Science

Charles Sturt University

Wagga Wagga, New South Wales, Australia

E-mail address: hrandle@csu.edu.au

Natalie Waran

Eastern Institute of Technology

Taradale, Napier, New Zealand

E-mail address: NWaran@eit.ac.nz

References

- Ali, A.B.A., El Sayed, M.A., McLean, A.K., Heleski, C.R., 2019. Aggression in working mules and subsequent aggressive treatment by their handlers in Egyptian brick kilns—Cause or effect? *J. Vet. Behav.: Clin. Appl. Res.* 29, 95–101.
- Crago, F., Shea, G., James, O., Schemann, K., McGreevy, P.D., 2019. An opportunistic pilot study of radiographs of equine nasal bones at the usual site of nosebands. *J. Vet. Behav.: Clin. Appl. Res.* 29, 70–76.
- Dumbell, L., Lemon, C., Williams, J., 2019. A systematic literature review to evaluate the tools and methods used to measure rein tension. *J. Vet. Behav.: Clin. Appl. and Res.* 29, 77–87.
- Fenner, K., McLean, A., McGreevy, P., 2019a. Cutting to the chase: How round-pen, lunging and high-speed liberty work may compromise horse welfare. *J. Vet. Behav.: Clin. Appl. and Res.* 29, 88–94.
- Fenner, K., Freire, R., McLean, A., McGreevy, P., 2019b. Behavioral, demographic, and management influences on equine responses to negative reinforcement. *J. Vet. Behav.: Clin. Appl. and Res.* 29, 11–17.
- Hall, C., Helski, C., 2017. The role of the ethogram in equitation science. *Appl. Anim. Behav. Sci.* 190, 102–110.
- Hall, C., Randle, H., Pearson, G., Preshaw, L., Waran, N., 2018. Assessing equine emotional state. *Appl. Anim. Behav. Sci.* 205, 183–193.
- Hötzel, M.J., Vieira, M.C., Leme, D.P., 2019. Exploring horse owners' and caretakers' perceptions of emotions and associated behaviors in horses. *J. Vet. Behav.: Clin. Appl. Res.* 29, 18–24.
- ISES, 2018. Principles of learning theory in equitation. www.equitation-science.com/equitation/principles-of-learning-theory-in-equitation. (Accessed 3 October 2018).
- Janczarek, I., Wilk, I., Stachurska, A., Krakowski, L., Liss, M., 2019. Cardiac activity and salivary cortisol concentration of leisure horses in response to the presence of an audience in the arena. *J. Vet. Behav.: Clin. Appl. Res.* 29, 31–39.
- Lea, S.E.G., Kiley-Worthington, M., 1996. Can animals think? In: Bruce, V. (Ed.), *Unsolved mysteries of the mind: tutorial essays in cognition*. Erlbaum (UK) Taylor & Francis, Hove, Sussex, pp. 211–244.
- Kiley-Worthington, M., 1997. *Equine welfare*. J.A. Allen & Company Ltd, Newton Abbot.
- King, S., Wills, L., Randle, H., 2019. Early training of foals using the ISES training principles. *J. Vet. Behav.: Clin. Appl. Res.* 29, 140–146.
- Ladewig, J., 2019. Body language: its importance for communication with horses. *J. Vet. Behav.: Clin. Appl. Res.* 29, 108–110.
- Padalino, B., Loy, J., Hawson, L., Randle, H., 2019. Effects of a light-colored cotton rug use on horse thermoregulation and behavior indicators of stress. *J. Vet. Behav.: Clin. Appl. Res.* 29, 134–139.
- Pierard, M., Hall, C., König von Borstel, U., Averis, A., Hawson, L., McLean, A., Nevison, C., Visser, K., McGreevy, P., 2015. Evolving protocols for research in equitation science. *Appl. Anim. Behav. Sci.* 10, 255–266.
- Pierard, M., McGreevy, P., Geers, R., 2019a. Reliability of a descriptive reference ethogram for equitation science. *J. Vet. Behav.: Clin. Appl. Res.* 29, 118–127.
- Pierard, M., McGreevy, P., Geers, R., 2019b. Effect of density and relative aggressiveness on agonistic and affiliative interactions in a newly formed group of horses. *J. Vet. Behav.: Clin. Appl. Res.* 29, 61–69.
- Pierard, M., McGreevy, P., Geers, R., 2019c. Effect of preceding activity and multiple testing of Belgian police horses on behavior during personality tests. *J. Vet. Behav.: Clin. Appl. Res.* 29, 111–117.
- Randle, H.D., 2015. Personality and performance: the influence of behavior. In: Williams, J.M., Evans, D. (Eds.), *Training for equestrian performance*. Wageningen Academic Publishers, The Netherlands.
- Randle, H., 2017. Equitation Science in practice: past, present and future. In: *Proceedings of the thirteenth international conference of the International Society for Equitation Science, Wagga Wagga, Australia*, pp. 29–30.
- Randle, H., 2019. Equitation Science in practice: past, present and future. *Abstracts ISES 2017. J. Vet. Behav.: Clin. Appl. Res.* 29, 147.
- Randle, H., Steenbergen, M., Roberts, K., Hemmings, A., 2017. The use of the technology in equitation science: A panacea or abductive science? *Appl. Anim. Behav. Sci.* 190, 57–73.
- Randle, H., Waran, N., 2017. Breaking down barriers and dispelling myths: The need for a scientific approach to Equitation. *Appl. Anim. Behav. Sci.* 190, 1–4.
- Thompson, K., 2019. How horse owners in Australia determine if the social and behavioral needs of their horses are being met: Findings from an online survey. *J. Vet. Behav.: Clin. Appl. Res.* 29, 128–133.
- Vermeulen, L., Van Beirendonck, S., Van Thielen, J., Driessen, B., 2019. A review: Today's practices about the fitness for travel on land of horses towards the slaughterhouse. *J. Vet. Behav.: Clin. Appl. Res.* 29, 102–107.
- Waran, N., Randle, H., 2017. What we can measure, we can manage: The importance of developing robust welfare indicators for use in Equitation. *Appl. Anim. Behav. Sci.* 190, 74–81.
- Waran, N., Randle, H., 2019. Standing on the shoulders of giants: building foundations for the future of equitation science. *Abstracts ISES 2017. J. Vet. Behav.: Clin. Appl. Res.* 29, 147.