Equitation Science: The Application of Science in Equitation

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INTRODUCTION

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“I believe equitation science and equine learning theory should play a major part in the training and competing of all horses worldwide. Riders and trainers should have a fundamental knowledge of the horse’s mental capacity and the way it learns through habituation, operant conditioning and classical conditioning… Instead, in today’s competitive and money driven environment, we see the majority of horses ridden with application of leg and rein together, an inappropriate mixing of messages that causes conflict behaviors or desensitization… We also see the use of special gadgets to force and not train the animal to hold a certain posture. It is evident that although there are many thousands of riders who are able to pilot a horse at a competition, there are sadly very few practitioners who have the knowledge and commitment to train these animals according to the scientific principles of good animal training.” (Jody Hartstone, New Zealand Champion Grand Prix dressage rider and international competitor)

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Equine ethology, management, learning theory, skill, and talent combine to influence numerous outcomes in horse-rider interactions. The welfare of ridden horses merits scientific scrutiny because horses are largely trained using negative reinforcement and are required to respond to pressure-based signals rather than work for positive rewards. In the lay equestrian literature, the use of light aids (signals or cues) and the minimal use of punishment are highly regarded. However, as illustrated in work presented at the first International Equitation Science Symposium (2005), dressage judges struggle to identify light rein tensions (de Cartier d’Yves & Ödberg, 2005).

Equitation science provides the potential for removing the subjectivity and emotiveness evident when considering the welfare of the ridden horse. Examples include research into how much rein tension is too much (Clayton, Singleton, Lanovaz, & Cloud, 2003), how much contact is neutral, how contact and discomfort can be measured (McGreevy, 2007; Warren-Smith, Curtis, Greetham, & McGreevy, 2007), and how learned helplessness may be manifest in horses (Hall, Goodwin, Heleski, Randle, & Waran, 2008/this issue).

These topics were among those explored at the third International Equitation Science Symposium, hosted by Michigan State University in August 2007. Eight of the papers presented appear in full in this Special Issue of the journal. The topic of learned helplessness formed the focus of a keynote address by Carol Hall, who showed that when there is no possible escape from aversive stimuli, learning differs from habituation (Hall et al., 2008/this issue). Horses in training are vulnerable to this outcome because the pressures that underpin negative reinforcement may be excessive and sustained even when horses have responded appropriately. Apathy is a critical feature of nonhuman animals who have learned that resistance is futile (Webster, 1994). The lack of active behavioral responses in such animals increases the need for physiological measures, for example, heart rate variability, which characterizes the state of learned helplessness (Stamp-Dawkins, 2006).

The links between responses that we give horses and the horses’ reactivity are of immense interest to trainers and riders. Applying two (conflicting) signals simultaneously is a flaw in training practice that reliably creates confusion and forces animals to focus on one stimulus rather than the other (Kamin, 1969). McLean (2008/this issue) describes the way in which this manifests all too frequently in equitation. However, he goes on to show how competition between stimuli (overshadowing) can be used to control horses faced with aversive stimuli, including injections and loading. This principle has countless applications in horse handling and training. Giving horses one stimulus to respond to at a time is emerging as a critical skill in horse training. So, it is opportune that Murphy (2008b/this issue) introduces the novel concept of using an automated horse walker during foundation training. He notes that this approach may reduce conflict behavior in the horse. Giving the horse as clear
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signals as possible is of paramount importance and underpins the focus on riders developing an independent seat (balance that reduces random movement in the saddle) and allows the delivery of distinct cues via the reins, legs, and the seat itself. Zetterqvist Blokhuis, Aronsson, Hartmann, Van Reenen, and Keeling (2008/this issue) have developed techniques for assessing the rider’s seat and its effect on horse performance under saddle. This is likely to be an area of considerable research interest in the emerging discipline of equitation science, so it is appropriate that this report highlights the difficulties encountered in early trials.

The combination of negative and positive reinforcement has considerable appeal to horse trainers who are keen to tap into motivations other than relief from pressure.

Heleski, Bauson, and Bello (2008/this issue) discuss the use of additional positive reinforcement in improving learning to cross an aversive ground surface. Interestingly, these benefits were noted only for the most frightened horses.

The demands placed on horses in high-level competitions are of particular interest to equitation scientists because they constitute the ultimate goals of many trainers and because many of the training techniques used by elite competitors inform practices adopted by riders at lower levels. The utility and safety of novel methods should be rigorously tested, not assumed. The equestrian welfare debate in the 1970s revolved around the practice of rapping, which was eventually outlawed from show jumping by the Fédération Equestre Internationale (FEI). However, the topic of show-jumping practices reemerged at the Michigan meeting. Boots are increasingly being applied to the metatarsal region of show jumpers. They are ostensibly for protection of the horse, but their unusual design and apparent tightness have given rise to suspicion that they may pinch the legs and trigger hyperflexion of the fetlock when the equines reach the zenith of their trajectory (Murphy, 2008a/this issue).

Visser, Van Reenen, Zetterqvist Blokhuis, Morgan, Hassmén, Rundgren, and Blokhuis (2008/this issue) report advances in temperament testing of horses and the predictive merits of horse temperament on riding performances. This is of ethical importance as testing of young stock may prove helpful in maintaining progress in the selection of riding horses. It is hoped that standard protocols will soon be defined at future International Society for Equitation Science symposia so that results may be easily pooled for meta-analysis. This outcome is especially important given the expense of maintaining horses under experimental conditions.

Breed differences in the reactivity of horses and their relative tendency to be sensitive and easily sent into conflict are of great interest to horse breeders, trainers, and riders. Paedomorphosis, the retention of juvenile morphology at maturity, is important in generating evolutionary change and in domestication. When dogs are compared with their ancestral species, the wolf, paedomorphosis
manifests in the physical and behavioral traits of different breeds (Goodwin, Bradshaw, & Wickens, 1997). If this occurs in horses, it may explain physical and behavioral differences across the breeds and have implications for the training and welfare of different breeds (Goodwin, Levine, & McGreevy, 2008/this issue). Hennessy, Quinn, and Murphy (2008/this issue) report on how different expectations between horse producers and purchasers may lead to equine wastage and welfare concerns.

The recent renaissance of popularity for the “horse whisperer” reminds us that there are individuals who have rare gifts at an intuitive level in understanding horses and their behavior. Additionally, it offers some novel interpretations of the motivation of horses undergoing training. Round-pen training forms the focus of many natural horsemanship training systems. It relies on the horse’s instinctive response to move away from potential predators. The horse learns that moving toward the trainer leads to the reduction in aversive stimuli such as staring by the trainer. Krueger (2007) began to explore the science behind these alternative approaches. Noting that horses undergoing round-pen training might simply learn how to avoid being chased, that is, negative reinforcement, this report emphasized that after “successful” round-pen training, horses show no increase in their tendency to follow trainers (Krueger, 2007), leading us to question the utility of such a potentially detrimental technique. Inspired by this approach, Warren-Smith and McGreevy (2008/this issue) decided to test the suggestion that round-pen training elicits signals from the horse that are analogous to those that occur during interactions with senior conspecifics. This study introduced mature mares to yearling colts in a corral. The agonistic interactions failed to result in a reduced proximity of both members of the dyad, thus bringing into question the ethological relevance of common round-pen practices. This study should stimulate further work that tests the extent to which round-pen responses may have been misinterpreted.

Clearly, equitation science offers objective opportunities for horse owners, riders, and trainers to manage potential threats to the welfare of the horse during production, training, warm-up, and competition. It was therefore encouraging to see the FEI’s welfare subcommittee represented at the meeting by German veterinarian Michael Duee.

The other exciting event at the Michigan meeting was the birth of an academic society devoted to equitation science. The International Society for Equitation Science held its first general meeting, elected its council members, and ratified its constitution. The society’s mission is to promote and encourage the application of objective research and advanced practice, which will ultimately improve the welfare of horses in their associations with humans. The aims of the society are to encourage and support basic and applied research into the training and welfare of horses used by humans. The society will provide an international forum in which scientists can communicate and discuss the
results of the aforementioned research. It is already fostering exciting links between applied animal behavior science, veterinary science, psychology, and other disciplines. The membership is committed to supporting the teaching of equitation science in academic and practical settings. It represents a pool of expertise to national governments, international bodies, industry, and to those equine welfare organizations that deal with problems involving equine behavior, training, and welfare. It aims to encourage—where possible and appropriate—the assimilation of scientific knowledge and to facilitate its use in relation to practical problems concerning how horses are trained, managed, housed, and cared for. Colleagues who can see merit in these objectives or are interested in attending the next meeting (to be held in Dublin in August 2008) are encouraged to visit www.equitationscience.com

REFERENCES


