PRINCIPLES OF LEARNING THEORY IN EQUITATION

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1. TRAIN ACCORDING TO THE HORSE'S ETHOLOGY AND COGNITION

DOES YOUR TRAINING DEMONSTRATE recognition of ethology and cognition?

Ethology is the study of animal behavior that provides information on how horses have evolved to live. It helps to explain natural equine social structures, including complex dynamic social organization with a social rank that determines access to resources. Horses need the company of their own species and readily form attachment bonds, so isolation is detrimental. They have evolved to walk and graze for about 16 hours per day and their digestive system and behaviors have adapted to this regimen.

Cognition refers to the ways animals process information about the world. Compared to humans, their prefrontal cortex is diminished, so horses may not recall events as we do. They excel at memorizing and recognizing stimuli that trigger certain responses – this is what keeps them safe. We must be careful not to overestimate equine intelligence (e.g., "he knows what he did wrong"), especially in an attempt to justify punishment. Equally, we should not underestimate equine intelligence by supposing that horses don't have emotions and feelings.

WELFARE IMPLICATIONS: Over- or underestimating horses' intelligence has negative welfare implications. Isolation, restricted locomotion and foraging have welfare implications.

2. USE LEARNING THEORY APPROPRIATELY

DOES YOUR TRAINING DEMONSTRATE the appropriate use of Habituation, Sensitization, Operant conditioning, Shaping and Classical conditioning?

Habituation is recognized when animals stop responding to events and stimuli as they become accustomed to them. Horses are innately fearful of the new/unfamiliar (i.e., neophobic) and often find the characteristics of various stimuli aversive (e.g., size/magnitude; novelty; proximity; and sudden appearance or occurrence). Movement, especially if erratic or is advancing towards them, may be hard for them to identify, even when familiar. Habituation can be used to defuse reactions to aversive stimuli in a process called desensitization. Systematic desensitization, approach conditioning, overshadowing and counter-conditioning are some methods of desensitization.

Sensitization is when an individual's response intensity is increased. If an individual experiences a series of arousing stimuli, sensitization describes the likelihood that it will respond more quickly or with more intensity to this or another stimulus that is presented soon after.

Operant conditioning describes training using rewards and consequences. There are 4 subsets:

1. Positive reinforcement: The addition of something the horse values to increase the occurrence of a desired behavior. Primary reinforcers can be any resource that horses naturally value. Examples used in training are food and touch. To be used as rewards in training, they must be issued to the horse immediately at the onset of the correct response. Secondary positive reinforcers have to be linked to primary reinforcers. They often take the form of auditory stimuli, such as a clicker or a consistent vocalized sound issued when the desired response is offered.

2. Negative reinforcement: The removal of something the horse wants to avoid, to increase the occurrence of a desired behavior. Negative reinforcement can and should be very subtle. Pressure motivates horses but the release of that pressure is what trains them. Applying pressure for inter-gait and intra-gait transitions relies on the trainer beginning with a light pressure cue followed by the maintenance or increase of the pressure and then the release. Good trainers always aim to reduce cues to light forms of pressure.

3. Positive punishment: Adding something aversive to reduce the occurrence of a behavior. Positive punishment has negative welfare implications so should be avoided. If used, it must be contingent and contiguous with the undesirable behavior.

4. Negative punishment: Removing something the horse values to reduce the occurrence of a behavior. Negative punishment is rarely used except for prompt removal of attention or food to suppress a behavior. If delayed, it is ineffective.

Shaping is the gradual step-by-step building of behaviors. Each step should differ only slightly from the previous step so that it is as obvious as possible for the horse to trial (or offer) the correct/desired response.

Classical conditioning uses cues and signals to trigger and elicit behaviors. They must be timed with exquisite precision to coincide with the start of the desired behavior.

WELFARE IMPLICATIONS: The use of pressure/discomfort has the potential for serious welfare implications that range from escape, aggression and apathy to learned helplessness.

3. TRAIN EASY-TO-DISCRIMINATE SIGNALS

DOES YOUR TRAINING DEMONSTRATE that operant and classically conditioned signals are unique and easily discriminated for:

1. Up/down gait transitions?

2. Faster/slower variations?

3. Longer/shorter variations?

4. Turning of forelegs?

5. Turning of hindlegs?

6. Head/neck flexions/head carriage?

Ensure that acceleration signals differ significantly from deceleration signals.

WELFARE IMPLICATIONS: Blurred and ambivalent signals can lead to confusion, distress and responses that compromise performance and rider safety.

4. SHAPE RESPONSES AND MOVEMENTS

DOES YOUR TRAINING DEMONSTRATE that, for any behavior modification, training begins by reinforcing basic attempts at the target behavior and then gradually improving approximations of that behavior?

WELFARE IMPLICATIONS: Poor shaping can lead to confusion and responses that compromise performance and rider safety.

5. ELICIT RESPONSES ONE-AT-A-TIME

DOES YOUR TRAINING DEMONSTRATE that individual cues/signals are separated in time from each other? Simultaneous cues for different responses inhibit each other and become gradually desensitized. When contradictory cues are applied simultaneously, such as those for acceleration and deceleration, the desensitization effects are magnified and confusion and stress are likely to set in. With education, cues can be issued closer together.

WELFARE IMPLICATIONS: Clashing cues weaken stimulus control and can lead to confusion and responses that compromise performance and rider safety.

6. TRAIN ONLY ONE RESPONSE PER SIGNAL

DOES YOUR TRAINING DEMONSTRATE that each signal elicits a single response? (However, each response can be elicited by more than one signal.) Above all, acceleration signals must be separated from deceleration signals.

WELFARE IMPLICATIONS: Ambiguous rein and leg signals lead to confusion and responses that compromise performance and rider safety.

7. FORM CONSISTENT HABITS

DOES YOUR TRAINING DEMONSTRATE consistency, so that in training new responses, training is set up in the same context each time, and the same signals are used on the same part of the horse's body or in the same location relative to the horse's body? After each response is consolidated, the locations can be gradually altered. Shape transitions to be of the same structure and duration each time.

WELFARE IMPLICATIONS: Inconsistent training can lead to dull responses that compromise performance.

8. TRAIN PERSISTENCE OF RESPONSES (SELF-CARRIAGE)

DOES YOUR TRAINING DEMONSTRATE the duration of locomotory responses so that the horse learns to 'keep going' in rhythm, straightness and outline to avoid any need for constant signalling and the risk of the horse habituating to signals?

WELFARE IMPLICATIONS: The consequences of a lack of self-carriage range from dull responses to hyper-reactive responses that compromise performance, welfare and rider safety.

9. AVOID AND DISSOCIATE FLIGHT RESPONSES (BECAUSE THEY RESIST EXTINCTION AND TRIGGER FEAR PROBLEMS)

DOES YOUR TRAINING DEMONSTRATE the avoidance of flight responses? Flight responses have unique characteristics, such as resistance to extinction, and may reappear spontaneously. Flight response behaviours are often accompanied by:

1. Raised catecholamine and glucocorticoid activity (e.g., increased adrenaline and cortisol levels)

2. Increased muscle tone

3. Aggression, including redirected aggression

4. Conflict and displacement behaviours

If stress is continuous, the following may occur:

3. Learning and memory deficits

4. Compromised immunity

5. Digestive disturbances

6. Ritualisation of original conflict behaviours

7. Redirected aggression

8. Long-term insecurity (e.g., separation-related distress, fence walking, fear of conspecifics or horse shyness and increased neophobia).

WELFARE IMPLICATIONS: Acute stress shows up as problem behaviours (escape, aggression, apathy). Chronic stress has very serious welfare implications, including learned helplessness, and can be fatal.

10. DEMONSTRATE MINIMUM LEVELS OF AROUSAL SUFFICIENT FOR TRAINING (TO ENSURE ABSENCE OF CONFLICT)

DOES YOUR TRAINING DEMONSTRATE appropriate relaxation? Trainers should be able to show that the horse is as relaxed as possible. Certain levels of arousal, muscle tone and attentiveness are required for successful learning, but when these levels are exceeded, learning and welfare suffer.

WELFARE IMPLICATIONS: Too much arousal may lead to compromised welfare, which may show up as acute/chronic stress (escape, aggression, apathy).

These principles are essential for optimal welfare and training efficiency. They apply to all horses regardless of breed, age, training level and equestrian discipline. These principles are presented as further refinements of the original 8 Principles on the International Society of Equitation Science (ISES) website and in peer-reviewed literature (McGreevy and McLean, 2006).