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Negative versus positive reinforcement: An evaluation of training strategies for rehabilitated horses

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Abstract

Rescued equids are often exposed to rehabilitation and training (or retraining) programmes to improve their physical and psychological well-being as well as to facilitate the re-homing process. Training uses either positive or negative reinforcement learning procedures and it is considered here that, there may be welfare implications associated with using the latter technique as it has the potential to overlay acute stress on animals with a chronic stress life history. The aim of this study, therefore, was to compare these training strategies (negative versus positive reinforcement) on equine behaviour and physiology as the first step in establishing an optimal rehabilitation approach (from a welfare perspective) for equids that have been subjected to chronic stress in the form of long-term neglect/cruelty. Over a 7-week period, 16 ponies (aged 6–18 months) were trained using either positive ('positive') ($n = 8$) or negative reinforcement ('negative') ($n = 8$) techniques to lead in hand, stand to be groomed, traverse an obstacle course and load into a trailer. Heart rate was measured (5 s intervals) on days 1 and 4 of each training week, 'Pre'- (1 h), 'During' (0.5 h) and 'Post'- (1 h) training session. Ethograms (10.00–20.00 h) outside of the training period were also compiled twice weekly. In addition, weekly arena tests (as a measure of reactivity) were also performed 1 week before and during the 7 weeks of training.

Results showed significant differences between the two training schedules for some measures during the latter stages of the trial and suggested that animals trained under a positive reinforcement schedule were more motivated to participate in the training sessions and exhibited more exploratory or 'trial and error' type behaviours in novel situations/environments. In this context, the incorporation of positive reinforcement schedules within a rehabilitation programme may be of benefit to the animal from a welfare perspective.

Keywords: Horse; Training; Positive reinforcement; Negative reinforcement; Stress; Rehabilitation

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1. Introduction

Within the UK, horses subjected to long-term neglect/cruelty (chronic stress) are often rescued by equine welfare charities. These animals normally proceed through a process of rehabilitation (to improve physical and psychological well-being) and, if possible, a regime of training (or retraining) to facilitate re-homing as a safe riding/companion animal and thereby improve the overall quality of life for the animal.

Within the various welfare organisations, different training strategies are often applied using either 'conventional' (e.g. British Horse Society) or 'modern' (e.g. Parelli, Monty Roberts, clicker training) techniques. These techniques can be categorised in terms of whether they apply negative or positive reinforcement schedules or a combination of both. Both forms of reinforcement involve associative learning (Gleitman, 2003), the linking of one stimulus to another and the association of actions with the attainment of something positive (e.g. food) or the avoidance of something the animal considers to be unpleasant (e.g. physical pressure or pain). In several species, it has been well documented that, for animals previously exposed to chronic stress, subsequent exposure to mild acute aversive stimuli will produce a heightened stress responses (e.g. O'Connor et al., 2004). The application of training techniques that employ negative reinforcement through the application of physical pressure may, therefore, be inappropriate for rescued horses that have a life history of chronic stress. Furthermore, horses exposed to sub-optimal husbandry conditions (Rivera et al., 2002) are also reported to be less receptive to negative reinforcement techniques. Negative reinforcement may thus also be an unproductive strategy of training (or retraining).

The aim of this study, therefore, was to compare the behavioural and physiological effects of negative versus positive reinforcement-based training techniques on horses that had been rescued from a situation of maltreatment. The first objective was to measure the physiological (heart rate) response of both groups in anticipation of, during and after the training sessions. The second objective was to examine both the behavioural and physiological (heart rate) responses of both groups to a series of validated temperament tests during the training period. The third objective was to obtain information about the general behavioural profile of horses in each training group during the training period.

2. Material and methods

2.1. Animals and husbandry

Sixteen Welsh sections A and B ponies (6–18 months), which had been rescued from three areas of common land in Wales (Gelligeir, Llangynidr and Glenmorang) were used in this experiment. The ponies were rescued on the grounds of abandonment and starvation due to overcrowding and, on arrival, were condition scored between one and three under the Equine Industry Welfare Guidelines (ADAS, 2002). Unwanted ponies are abandoned onto common land by previous owners and typically have a history of group (herding, loading) rather than individual (halter, bridle, saddle) handling. A pre-trial rehabilitation period between 2 and 5 months allowed the ponies to attain full physical health. This time period was spent grazing as a group in a 12-acre paddock with no human contact. One month prior to the experiment, ponies were herded into a barn and then individually stabled thereafter. Stables were in two blocks of six and one block of four and all ponies had visual contact with neighbouring conspecifics. All ponies were subject to the same husbandry procedures. Thirty days were spent desensitising the head and girth regions of all ponies so that head collar and surcingle could be applied. No other contact was given. Once the trial and training commenced all ponies were stabled individually from Monday morning to Friday afternoon and then returned to the paddock as a group during the week-end.