

# Equine learning

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## Introduction

The humane treatment of animals requires management methods minimising stress (severe physiological and behavioural disturbance) (Bryden, 1998). Learning is a relatively permanent change in behaviour following reinforcement (McLean, 1996), resulting in the establishment of habits or automatic responses. Increasing expectations of equine performance place increased pressure on training methods as horses must suppress natural instincts and discriminate and respond to a wide variety of stimuli during learning processes (McCall, 1990). The incorporation of up-to-date training psychology in equine training will ensure psychological and behavioural needs are best met.

## Discussion

Burgin and McCall (2002) paired forty-eight horses to determine whether secondary reinforcement prolonged extinction of learned tasks. Horses were shaped to push levers to obtain primary reinforcers (60g concentrate). One horse in each pair received secondary reinforcement (buzzer sound). Reinforcement was given for three days. On days four and five, no primary reinforcer was given. Extinction was determined after five minutes passed without the lever being pressed. Results indicated secondary reinforcement per se did not significantly prolong extinction. The horses were not food deprived and different results might have been obtained with increased food motivation. With individual drive levels, motivation affects how hard horses will work for food. There were no statistical differences in either frequency or duration of extinction between the groups, possibly due to inadequate numbers of training trials. Pats and handlers' voices are commonly used in horse training, as food rewards are not practical. Pairing of primary and secondary reinforcers strengthens the reward value of secondary reinforcers (McCall, 1990). If secondary reinforcers are not at least intermittently associated with primary reinforcement, they cannot be considered rewarding for performed behaviours.

To determine consistencies and associations between behavioural responses over time, Davidson et al. (2002) recorded behavioural responses of thirty-three horses. Arena, person (with/without eye contact) and object tests were conducted on three testing days. Responses (vocalisation, snorting, pawing, defecation and urination) were recorded and statistical analyses used to determine associations. Farm staff answered questionnaires on each horse regarding qualities such as handling, excitability, willingness and aggression. Different behavioural responses were shown to the different tests. Objective and subjective test results had no relationship. Wechsler (1995) classified horses as 'active' (try to escape, remove aversive stimuli) or 'passive' (appear unaffected, stop behaviour) copers. This study indicates there is too much variation in behavioural responses for these tests to predict individual temperaments, and that not all horses can be classified under Wechsler's theory.

To determine differences in training methods Kusunose and Yamanobeb (2002) divided twelve yearlings into daily and intermittently trained groups. Each horse, on four occasions, was evaluated on time (to complete course), skill (accuracy responding to cues), and heart rate during driving and riding tests. Repetition of driving tests I and II might have resulted in group similarities in these tests. More horses were disqualified (for deviations from marked courses) in the intermittently trained group. Excluding disqualifications, on average the daily-trained group finished the course significantly faster than the intermittently trained group. Hintz et al. (1980) found ponies trained once a week to jump small hurdles in response to a buzzer to avoid mild electric shocks required fewer training sessions than ponies trained daily. This difference might be due to the use of shock avoidance rather than animals responding to specific cues. The results suggest trainers using negative reinforcement should use small/moderate trials and space sessions over time. Avoidance studies are relevant to horse training practices as negative and secondary reinforcement are predominantly used.

Barneveld et-al. (2003) studied learning performance consistencies in thirty-nine horses using reward and avoidance learning tests. Avoidance learning tests required horses to place one foot over a bar between two horseboxes when a bell sounded. The aversive stimulus (puff-of-air) was given in the box containing the horse if one leg did not cross the bar. When one leg crossed the bar as the bell sounded, the bell stopped. Reward learning tests involved two food mangers with food dispensed automatically into one. To receive a reward (30g-concentrate) the horse had to put its nose into the correct manger. Horses not performing the desired behaviour within 8 and 30-minutes respectively were classed as non-performers. Behavioural variables (neighing, pawing and snorting) were measured.

The non-performers in one test were not non-performers in the other, so it is incorrect to assume that one type of learning test is indicative of general learning capabilities. Numbers of non-performers were stable in avoidance learning tests between years but decreased in reward learning groups. Two months prior to the second reward learning tests, horses were housed individually. As horses were tested alone, they were better adapted to the social conditions during testing, and probably less emotionally disturbed than during avoidance learning, during which horses remained in group housing. Adaptation to social isolation might have caused the decreased incidence of non-performers during the reward test in the second year. The study indicates emotionality might have been responsible for the existence of non-performers. Consistent learning performances within a short time interval were displayed in both tests, suggesting the existence of stable individual learning abilities. This suggests individual horses perform better when learning to avoid an aversive stimulus, and others when rewarded after a desired response. Rivera et al. (2002) found horses housed in stalls took longer to complete training procedures (habituation to equipment, groundwork and riding) than horses on pasture. Stalled horses held their heads/necks higher, bucked and jumped more frequently.

## Conclusion

Research has proven isolated housing can affect animals' behaviours and learning abilities- stalled horses are deprived of opportunities for social interactions and the performance of natural behaviours is limited. Optimal welfare would require the provision of enriched environments, if not through pasture housing, then by increasing the time horses spend in paddocks. As animal welfare involves mental, psychological and cognitive needs, incorporating research findings on equine learning will enhance equine-welfare. These studies show statistical data of learning tests and conditions that facilitate desired responses to learned behaviours most efficiently. The understanding and use of equine-cognition and motivational processes in regular training schedules will minimise stress and distress during learning processes, improving equine welfare.

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