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Behaviour modification and positive training techniques – an equine case study

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The term 'behaviour modification' was introduced by Edward Thorndike in the early 1900s and encompasses the principles of empirically altering an individual's reactions to specific stimuli via the application of learning theory in a practical context. Learning theory is a conceptual framework that describes the processes by which individuals learn and adapt their behaviour accordingly (Jensen, 2009).

The role of behaviour modification utilises both **classical** and **operant conditioning**. Classical conditioning was first popularly described by Edwin Twitmyer and Ivan Pavlov in the 1920s and is used in behaviour modification methods such as aversion therapy, systematic desensitisation and flooding. The basic principles of classical conditioning are shown in **Figure 1**.

Classical conditioning is often used in behaviour modification to condition an emotional response to a stimulus. For example, it may be used in the treatment of fears and phobias to alter an animal's

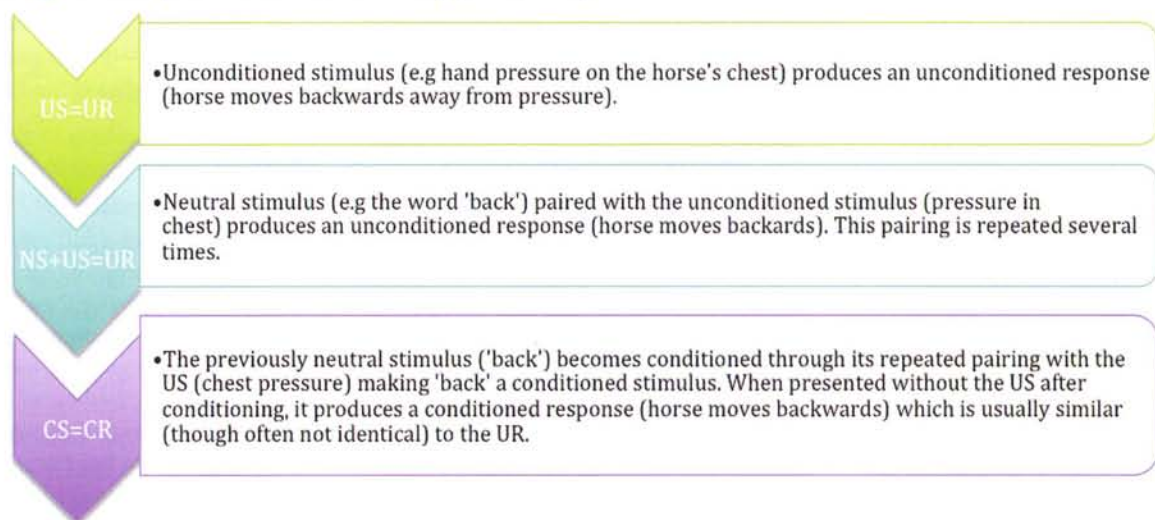
emotional response from negative through neutral to positive, often via the provision of a positive biologically valuable stimulus (e.g. food or stroking).

Operant conditioning was initially conceptualised and studied by Jerzy Konorski, Edward Thorndike and B. F. Skinner. The purpose of operant conditioning is to strengthen or weaken a given behaviour according to the type of reinforcement or punishment delivered after the performance of the behaviour. There are four quadrants of operant conditioning, as described in **Figure 2** (Jensen, 2009).

The theory behind these four operant quadrants is well documented and research has shown:

- Timing is crucial to the success of the reinforcement or punishment delivered. Solomon *et al.* (1968) discovered that punishment delivered to dogs after their indiscretion was much less effective than that delivered while the dogs were still doing what they were being punished for.

Figure 1. Principles of classical conditioning (Price, 2002)



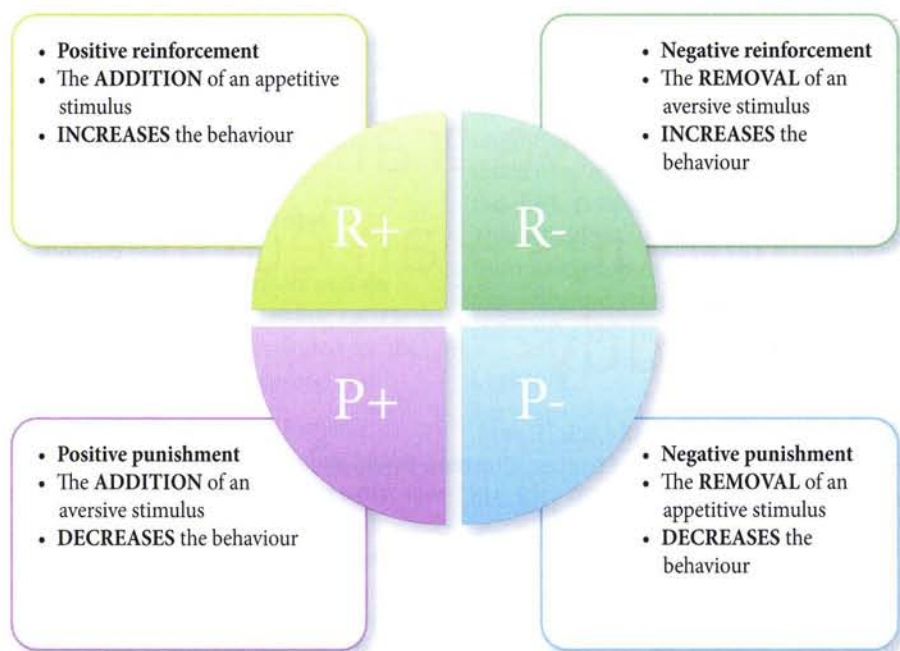


Figure 2. The four quadrants of operant conditioning

- In terms of the timing of positive reinforcement, Browne *et al.* (2013) found that a delay of up to a second in the delivery of positive reinforcement for completion of a task meant that dogs were much slower to learn the performance of that task.
- The use of aversive stimuli conditions a negative emotional response to the procedure being undertaken and inhibits the learning process. The dogs in Solomon's study which received delayed punishment were seen to display learned fear-related behaviours.

While the swift, skilled application of a punisher may in a few, specific situations be very effective, in general punishers are not skilfully applied and so may be perceived by the animal as being non-specific. They are often badly timed and applied in an emotional context, which serves to scare the animal and does not communicate effectively the link between the animal's behaviour and the consequent punishment.

In recent years there has been a shift in the approach to the training of animals from punishment and aversive techniques towards positive reinforcement methods that promote a positive emotional response in the animal, reduce stress responses and enhance learning (McGreevy, 2004). Research comparing the effectiveness of negative and positive reinforcement techniques consistently demonstrates

that animals trained using positive reinforcement techniques display fewer behavioural and physiological signs of stress and are quicker to learn the target behaviours than their counterparts trained using solely negative reinforcement protocols (Hendriksen *et al.*, 2011).

In practice, most behaviour modification plans utilise both classical and operant conditioning, as many behaviour problems require a process of systematic desensitisation to the 'collage' (combined array) of stimuli presented to animals in real life scenarios, followed by the fading out of unwanted behaviours and strengthening of the behaviours desired by the trainer.

A further consideration is the legal requirement that owners have appropriate levels of control of their domesticated animals, which, in many cases, necessitates the use of negative reinforcement methods (in the form of headcollars, harnesses and leads) in addition to positive reinforcement methods (McGreevy, 2004; McGreevy & McLean, 2010). The following case study is an example of a recent equine case.

History

Charlie presented as a recently 'broken' four-year-old Arabian x Gypsy cob gelding. He had been in the same ownership since he was bought as a yearling from a local breeder. Charlie's owners had previously owned a succession of three ponies that their

daughter grew out of, and they currently own Charlie and his field-mate, a retired riding cob.

Charlie had been broken to ride as a three-year-old and returned to the family who had gradually continued his ridden training. As training progressed, Charlie became more and more reluctant to be mounted from a mounting block. Eventually, avoidance behaviour escalated and the daughter of the family fell off several times while attempting to mount from the mounting block. At this point, behavioural and training advice was sought.

Presenting signs

- General reluctance to walk near the mounting block (various types of block)
- Refusal to stand by the mounting block
- Spinning around the mounting block and backing up away from it
- Rushing past the mounting block if forced to walk near it
- Making movements to lift the forelegs off the ground if restrained

Differentials

Zeitler-Feicht (2004) and McGreevy & McLean (2010) have identified a number of potential causes for the introduction and escalation of this type of behaviour problem, including:

- pain-related avoidance behaviour
- medical-related avoidance behaviour
- fear- or anxiety-related avoidance behaviour
- poor initial habituation and training technique when introducing the mounting block
- lack of habituation and training to the mounting block
- handler/rider error
- learned behaviour.

Diagnosis

Medical examination

Charlie underwent a full veterinary examination to determine if the cause of the behaviour was either directly linked to a medical condition or pain in response to an indirect medical issue. He was assessed by an equine physiotherapist and an equine dental technician prior to behavioural investigation and declared fully fit.

Behavioural investigation

Behavioural investigation was conducted at the yard where Charlie lives and is usually ridden. Charlie was observed in the stable, being tacked up, on long lines and at the mounting block. He was also assessed when mounted from the floor and with the rider being given a leg up as well as ridden under saddle.

A number of observations were made during this process:

- Charlie was calm and relaxed in the stable and when tied up outside for grooming.
- Bridling could be difficult at times due to Charlie's resistance to the insertion of the bit, although the owners had been successfully working with this issue.
- Charlie long-reined very well but was more reluctant to work on the right rein, especially in trot.
- Charlie showed immediate signs of tension and avoidance behaviour when the mounting block was introduced and the mounting block could not be placed next to him.
- Charlie could be mounted relatively successfully from the floor and via a 'leg up' with minimal movement from him during the process.
- He was very inexperienced and unbalanced under saddle, although he behaved in a calm manner, responding to most cues appropriately. Charlie was again more reluctant to work to the right.

Following careful assessment of Charlie's history and presenting signs, it was deduced that the avoidance behaviour seen at the mounting block was the result of a cumulative collage of stimuli and scenarios.

Lack of habituation and training to the mounting block

Two factors were noted:

- No process of gradual habituation was carried out during the initial use of the mounting block.
- No training was undertaken to teach Charlie to stand quietly and in a relaxed manner at the mounting block while the rider mounted and prepared to move off.

Handler and rider error

Charlie was rewarded for standing quietly at the mounting block, but the

timing of the reward was often incorrect and corresponded with Charlie walking away from the mounting block. Food items were sometimes given in order to stop his forward movement, which served only to strengthen the behaviour as it was rewarded by the administration of carrots during its performance (McGreevy, 2004).

Charlie's rider often mounted in an unco-ordinated manner. This meant that, on a regular basis, Charlie's reins would be used as balancing aids, his quarters would be knocked by the rider's leg and the rider would land heavily in the saddle. It was clear that Charlie found this aversive and associated this discomfort with the presence of the mounting block. This was observed to be the focal point of the problem and is likely to have initiated the negative behavioural response (McGreevy & McLean, 2010).

Fear- and/or anxiety-related avoidance behaviour

Lack of habituation and continual presentation of aversive stimuli (coupled with mistimed rewards) led to confusion and anxiety, with Charlie displaying a number of well-documented fear and avoidance behaviours on presentation of the mounting block (see box).

Fear and avoidance signs and behaviours (from McDonnell, 2003; Zeitler-Feicht, 2004)

- Increased heart rate
- Raised head carriage
- Stiff neck
- Tense hind-quarter muscles
- Flared nostrils
- Snorting
- Ears and eyes focused on the mounting block
- Gradual increasing of distance from the mounting block
- Flight and fight behaviour when restrained (head shaking, barging, sudden jumps away from stimulus, lifting of the front legs, tail swishing, bit chewing)

It is possible that Charlie was also anxious about the riding process itself, as he was very unbalanced and often displayed stress behaviours under saddle. Mounting could have become a predictive stimulus for being ridden, which might have been aversive to him.

Learned behaviour

This behaviour had been occurring for some time and had, through repetition and reinforcement, become a learned response to the mounting block and, later, to the rider standing on any object in an attempt to mount the horse. The mounting block had become a strong predictive stimulus for being mounted and Charlie would shy away from it at every opportunity (McGreevy, 2004).

Treatment

Goals

A list of the following treatment goals was drawn up.

- To conduct a programme of systematic desensitisation and counter-conditioning to the presence of the mounting block (Figure 3).
- To progress training so that Charlie could be mounted from the mounting block using a cue to ask him for a stand-still response.
- To generalise mounting from a number of different types of block (heights, colours, materials and so on).
- To develop the rider's mounting technique.
- To train the handler to give appropriate reinforcement upon performance of requested behaviours (timing training).
- To progress Charlie's ridden work and develop balance, co-ordination and confidence under saddle.

Treatment programme

The sequence of photographs that follow (Figures 4–7) demonstrate the systematic desensitisation (SD) and counter-conditioning (CC) processes when training reached the mounting phase. Training to reach this phase took just over ten days with three training visits and the owner also performing training as directed two or three times a day.



Figure 3. The process of systematic desensitisation and counter-conditioning to the mounting block (Mills & Nankervis, 1998)

Follow-up and further training


Charlie's newly trained behaviour is currently maintained through being positively reinforced upon each performance in order to strengthen it further (McGreevy & McLean, 2010).

In order to address rider mounting error and the associated discomfort and anxiety in Charlie, a mounting-training programme was implemented. The rider was trained to mount correctly and sensitively on a 'dummy' horse, progressing to a quiet schoolmaster horse, on to a more sensitive horse and finally generalising to mounting Charlie once the SD and CC process was complete with a professional rider.

Charlie also receives regular flatwork training to improve balance and strengthen co-ordination to promote confidence and increase positive associations with ridden work.

Outcome

Charlie has a strong and reliable response to the 'stand' cue for mounting and other scenarios where it is required at home. The response is slowly being generalised to a variety of places, mounting blocks and rider with good success. However, in novel scenarios, the time to obtaining a fully performed 'stand' for mounting is longer than when performed at home and requires a higher value type and quantity of reward, such as a succulent or a small amount of honey.

The rider receives weekly training sessions on Charlie and flatwork training is also progressing well. Charlie is now nearly as balanced and forward going on the right rein as on the left. 

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▣ **Figure 4.** Charlie standing in a relaxed manner and being rewarded on the performance of 'stand' cue when presented with the stimulus of the rider approaching (left), placing weight on the saddle (centre) and then on the stirrup leather (right)



▣ **Figure 5.** Charlie displaying some tenseness during the initial mounting phase (left and centre) but relaxing nicely once the rider is mounted (right)



▣ **Figure 6.** Charlie remaining very relaxed and producing a perfect 'stand' during the initial mounting phases



▣ **Figure 7.** Charlie maintains the relaxation and 'stand' on cue throughout the mounting process

NEWS REVIEW

by Jean Turner

Royal Veterinary College Animal Care Trust

In the ACT magazine *Paws and Hooves*, details are given of the funding required for equipment, ranging from £15,000 for an ultrasound scanner and linear probe for the Queen Mother Hospital for Animals down to £175 for Metzemaum scissors for the Equine Unit. Support has enabled the purchase of items such as a Digital Refractometer and Small Size Internal Paddles for the QMHA, Syringe Drivers for the Equine Referral Hospital and an Ultrasound Scanner for the Beaumont Sainsbury Animal Hospital in Camden Town in London.

Funds are raised at a variety of events: the 2013 London Marathon raised over £5,000 (the results of this year are not yet finalised) and a half marathon was run on 8 June in St Albans. Future events include the Prudential RideLondon, which takes place on 10 August, and Fright Hike 30K in Epping Forest on 1 November. A sponsored horse ride around the beautiful grounds of Hatfield House will take place on 12 October.

Information on all these events is available at www.rvc.ac.uk/act

Animal Health Trust

A series of A4 laminated information sheets has been designed as part of the Trust's Mission Statement to improve animal welfare through education of veterinary colleagues. The first one covers what to do in cases of status epilepticus.

Full-day CPD programmes are charged at £100 per delegate, to include lectures, refreshments and buffet lunch. Topics include Surgical emergencies on 25 September and All About Blood, anaemia, transfusion, clotting and bleeding on 27 November.

Free evening CPD meetings are also arranged: 17 July Pathology; 18 September Radiography; 16 October Hips; and 20 November Weight loss in the elderly cat. These start with light refreshments from 7.30 p.m. with talks starting at 8 p.m.

To register for any of these courses, please visit the website www.ahtreferrals.co.uk or email sacpd@aht.org.uk