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Introduction to Learning Theory

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What is Equitation Science?

International Society
for Equitation Science

The science of training and horse-riding

Includes learning theory, ethology & cognition, biomechanics, psychology & sport science.

Identifies what can be *defined* and *measured*

Does not deny other aspects such as rapport, love, trust, elegance, harmony etc.

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Do vets need to understand behaviour?

- Highest prevalence of occupational injuries within civilian professions
- Do 'happier' horses heal faster?
- Behaviour Modification is often not only safer but faster than traditional restraint

Prevalence of difficult horses

- Weekly: 63% (n=105)
- Monthly: 95% (n = 159)

How do Horses Learn?

- The mental capacities of horses
- Non-associative learning
- Classical conditioning
- Operant conditioning

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The Mental Capacities of Horses

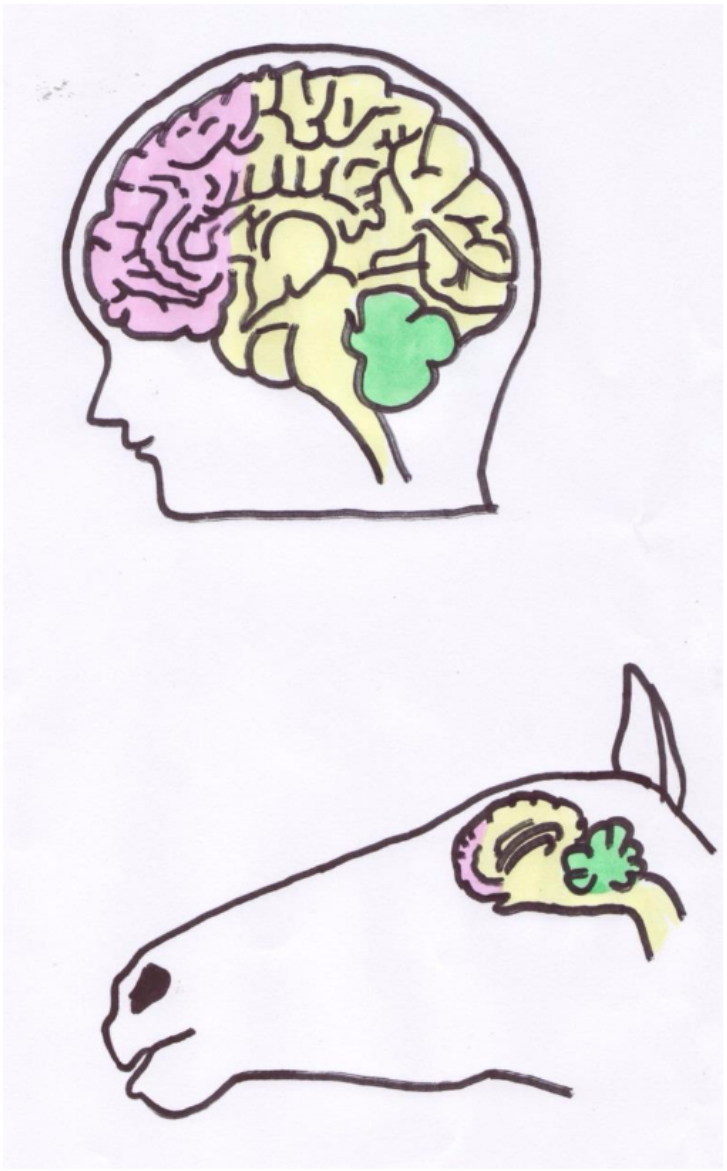
Poorly developed Prefrontal Cortex

No imagination

Unable to problem solve

Learn through trial and error

Excellent long term memory,
Poor short term memory



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Non-associative Learning

Occurs when a single stimulus
results in either **habituation** or **sensitisation**

Both are essential to horse training

Both occur from the first day of a foals life and continue throughout life

Remember horses are learning whenever you are around them –
weather you want them to be or not!

Classical Conditioning

Making **associations** between two previously unrelated cues

'Pavlov's dogs'

Increases **Predictability** of the environment

Consider one horse showing aggressive behaviour to a subordinate – Through previous learnt associations the subordinate horse will **predict** it is about to be bitten and can move away, thus preventing injury

Classical Conditioning

Race horses will urinate on cue when someone whistles

Clicker training (secondary positive reinforcement)

Head collar colour in police horses

Counter conditioning

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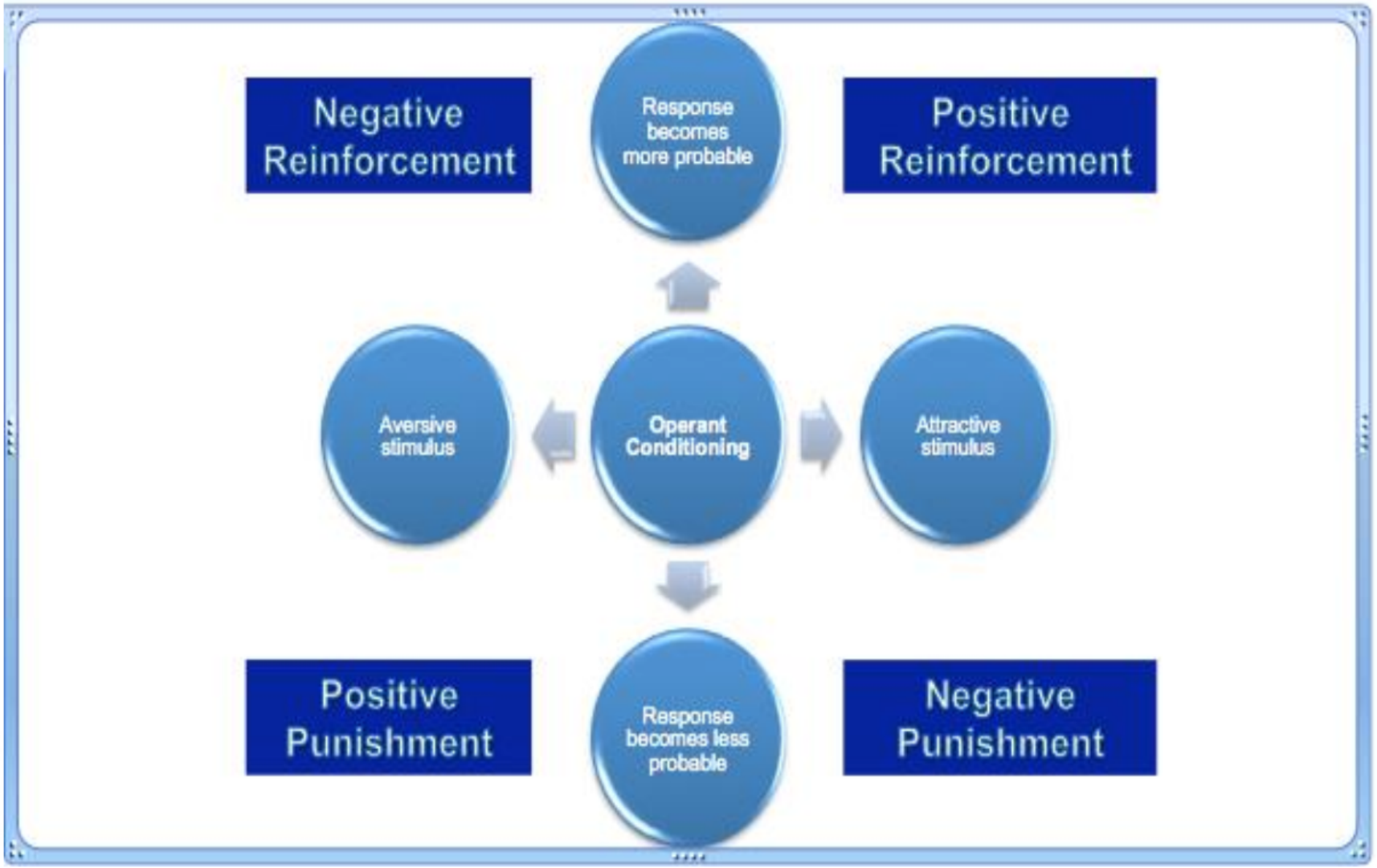
Operant Conditioning



Positive Reinforcement

The addition of something pleasant follows the correct response, that makes the horse more likely to repeat the behaviour in the future

Food

Scratching withers (not patting)

Timing is important

Secondary Positive Reinforcement

Clicker Training

An association between the ‘click’ and food allows timing of the desired behaviour to be signalled by the click

Improves timing

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Negative Reinforcement

‘Pressure release’

The removal of an aversive stimulus when the desired behaviour occurs, makes the horse more likely to offer that behaviour in the future

Consider horses that are too hot – they seek shade, horses that are thirsty – they seek water, horses that are irritated by a fly – the swish their tail

Each time the behaviour removes the source of discomfort

Negative Reinforcement

Hospital Case Study – Combination Reinforcement

Punishment

Punishment reduces the likely hood a behaviour will be offered again in the future

Positive punishment = applying an aversive stimulus after an unwanted behaviour has occurred to suppress it

Negative punishment = removing something pleasant from the horse after an unwanted behaviour has occurred to suppress it

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The Problems with Punishment

1) It lowers the motivation of the horse to trial new responses in training

- It is telling the horse what not to do, but not what it should be doing

2) The horse can become desensitised to the punishing stimulus

If the punishing stimulus is not enough to supress the behaviour the horse will gradually become habituated to increasingly powerful punishing stimuli

3) Timing

To supress a behaviour the punishment needs to occur at the same time as the behaviour occurs

If it occurs afterwards there is a chance the horse will associate the punishment with the immediate body reaction/ posture of the person, not with the unwanted behaviour

4) The horse may have an extreme reaction to the stimulus

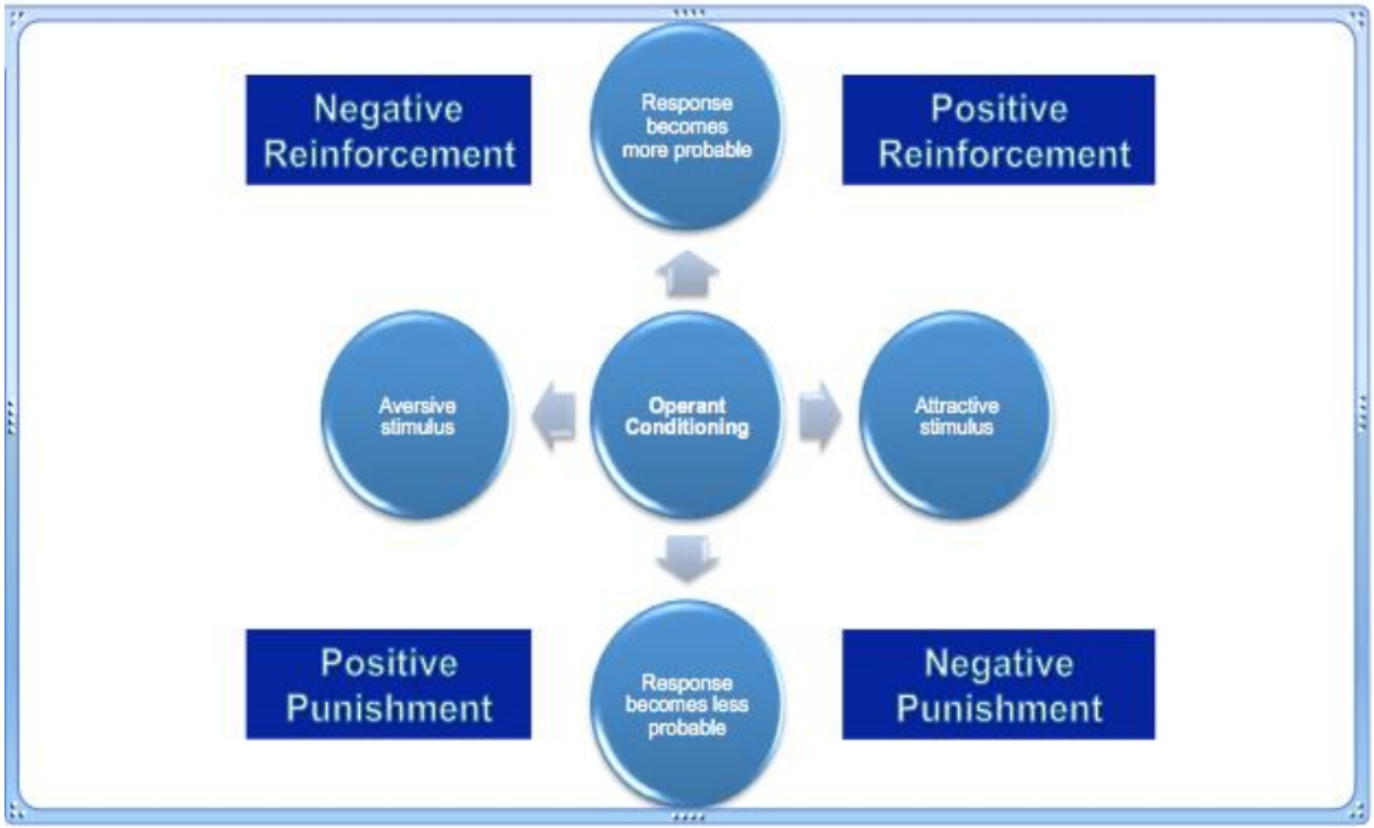
This is negatively reinforced if the reaction stops/delays the punishment

5) It creates powerful fear associations with the person/whip

Fear is learned from a single response and never completely extinguished (spontaneous recovery

Operant Conditioning

Gives the horse **Controllability** over its environment



Shaping

The horse is very unlikely to offer the final outcome early in training

Reward any basic attempts and then improved responses each time

Consider trying to train a dolphin to jump through a hoop then summersault 3 times before landing back in the water.

3 sets of 3 correct repetitions, is more effective than finishing on a good note

Motivation

Norfolk and Chance Vs Bob the Cob

? Level of arousal of the horse

- Increased sympathetic stimulation (Fear)
- Increases likelihood of hyper reactive responses – strongly associated with movement of the horses feet
- The fear response depends on how **fast** and how **far** the horse removes themselves from the aversive stimulus
- Fear is easily learned and subject to spontaneous recovery

Basic Trained Responses in Hand

Go (faster/longer)

Stop (slower/shorter)

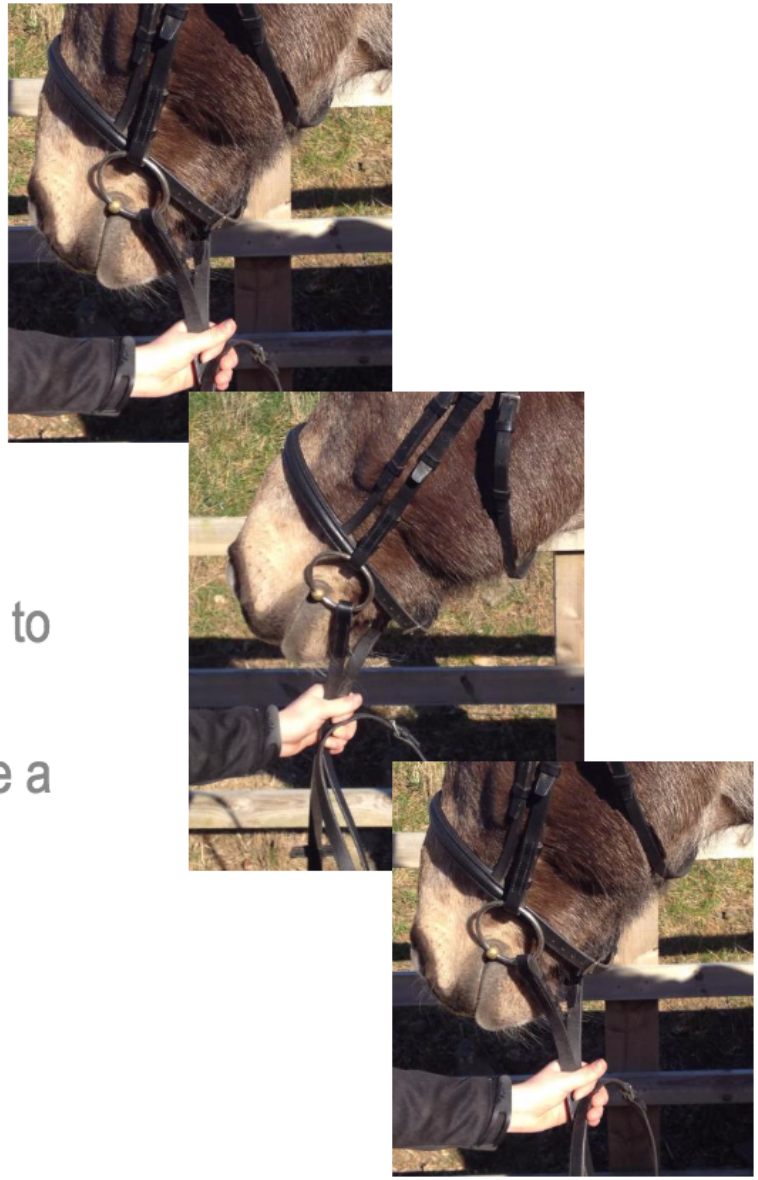
Back up

Park

Turn (front feet) / Yield (hind feet)

Head Control

Go



Operant aid – forwards signal on lead rope/reins

Correct basic response – horse takes a step forwards

Reward – release of pressure as soon as horse takes a **single step** forwards

Reinforcement – Gentle tapping with whip on girth region to motivate forwards step

Beware to ask the horse to walk forwards before you take a step yourself

Shape until the horse walks forwards **lightly and immediately** anywhere, any time

Stop

Operant aid – Backwards pressure on lead rope/reins

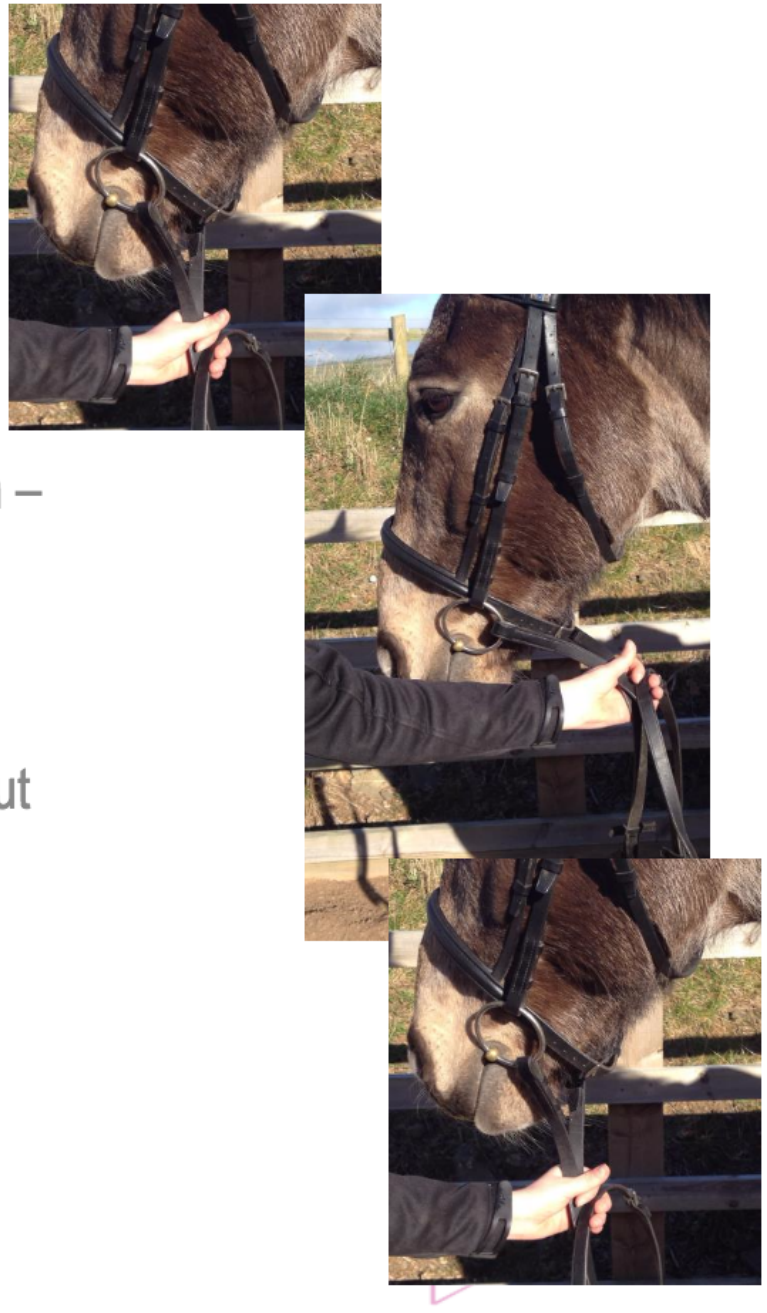
Correct basic response – both front feet stop

Reward – release the pressure

Reinforcement – Increasing pressure on lead rope/rein – also deepen back-up response

Shape until response is offered **immediately and lightly** any where, any time

Self Carriage – does the horse remain stood still without being held



Back-Up

Operant aid – Backwards pressure on lead rope/reins

Correct basic response – Horse takes a single step backwards

Reward – pressure is released

Reinforcement – gentle whip taps on cannon bones until he takes a step back

Shape until response is offered **immediately and lightly** any where, any time

Self Carriage – does the horse then maintain backwards steps or does he stop ?

Obedient Basic Responses

Park

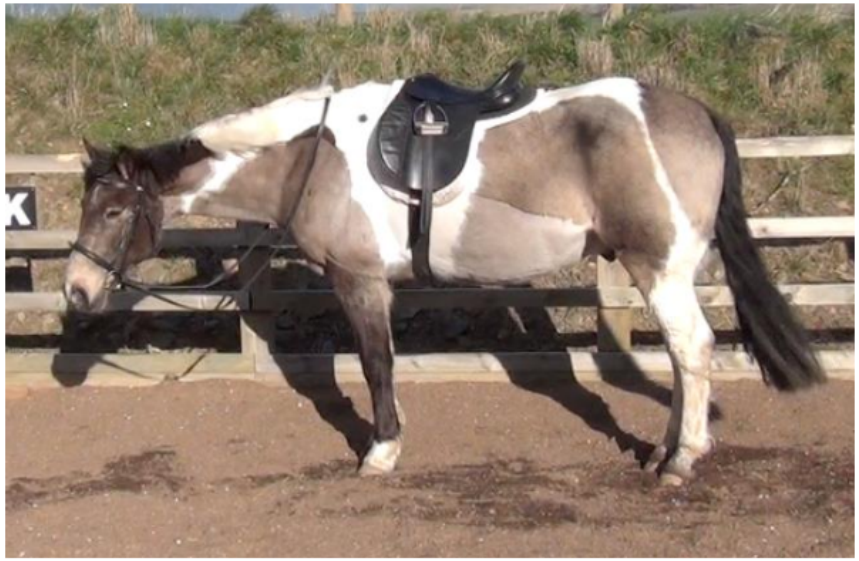
Operant aid – None!

Correct basic response – Horse remains stood still until you ask him to move

Reward – Come back in and give him a scratch after a correct response

Reinforcement – Use the reins or (preferably) point the whip at his cannons to get the back up response

Self Carriage – Is he willing to stand anywhere, anytime without being held.



A Good ‘Park’

Is it Pain or Behaviour?

Case Study 1 – Difficult to handle feet

Case Study 2 – Unpredictable Behaviour

Unpredictable, Jekyll and Hyde

Sudden bursts of aggression/dangerous behaviour

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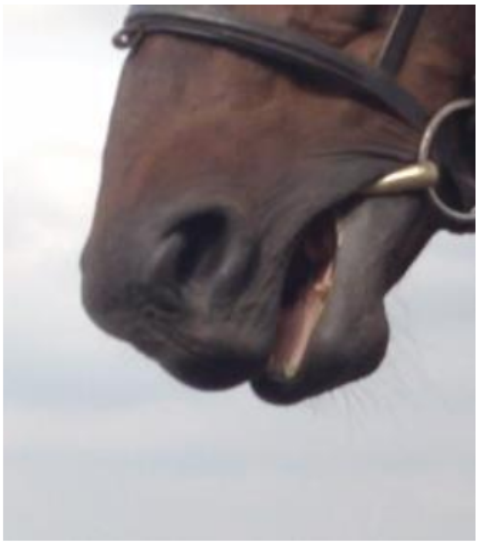
Leg aids = Go

Rein aids = Stop/slow

Conflicting aids

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Conflict Behaviour

- Constant (inescapable) pressure
- Painful pressure
- Inconsistent signals/release of pressure
- Ambiguous signals
- Conflicting aids

Take Home Messages

Negative (removal) reinforcement

Shaping

Arousal Levels

Remember, there are no ‘Bad’ horses, Just confused ones

Any Questions?

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