

Understanding Classical Conditioning in Horses

November 30, 2023 **Posted by** Lucile Vigouroux, MSc

Get answers to common questions about this equine-welfare-friendly training method.

Topics: Article, Behavior, Behavior & Handling, Horse Care, Horsemanship Science, Welfare and Industry

Classical conditioning is inherent in your many routine interactions with your horse. The rattling sound of grain buckets at dinner time eliciting excited nickers up and down the barn aisle? That's classical conditioning. A stallion that knows whether he's heading to his paddock or to the breeding shed based on the halter he's wearing? Also classical



Classical conditioning and associative learning can be a great way to bond with your horse and teach him fun tricks. | Courtesy Maureen Friedly, Foxtrot Photography

conditioning. The seasoned school horse that pins his ears at the sight of the saddle and girth? You guessed it, classical conditioning.

Also known as associative learning, classical conditioning is one of the oldest, simplest, and most widely used methods of training horses. For this article we've teamed up with two trainers to bring you the latest research and share practical applications for this powerful cognitive tool. Alex Travis, MSc, owner of Indigenous Equine, in Snowflake, Arizona, has a

master's degree in animal comparative biomedical science. She teaches holistic horsemanship practices based on the Least Intrusive, Minimally Aversive (LIMA) method, prioritizing positive reinforcement and liberty work. Shelby Dennis, owner of Milestone Equestrian, in British Columbia, Canada, is a certified equine behavior consultant through the International Association of Animal Behavior Consultants (IAABB) and holds a certificate of equine science from the University of Guelph, in Ontario. Dennis specializes in training horses with behavioral problems and is passionate about improving both equine welfare and scientific literacy in the horse industry. Our two sources have helped us answer five common questions about classical conditioning. Let's start with the basics.

1. What Is Classical Conditioning?

The horse-human relationship has been developing since the horse was first domesticated about 6,000 years ago. Associative learning has been used since the very beginning as one of the most basic forms of communication between the two species, but Ivan Pavlov coined the term "classical conditioning" in 1897. A Russian-Soviet scientist, Pavlov incidentally realized dogs that had learned to link the sound of a bell with being fed would eventually salivate at the sound of the bell alone, even in the absence of food. He called this a conditioned reflex. In essence, classical conditioning is the involuntary act of associating a neutral stimulus with a positive or negative one. The learned behavior

(salivating, in the case of Pavlov's dogs) is a conditioned, involuntary response to the previously neutral stimulus of the sound of a bell. Going back to the first example in our introduction, the rattling sound of the grain buckets is the equine equivalent of the dog's bell signaling the arrival of food.

2. Classical Conditioning vs. Operant Conditioning: What's the Difference?

Equestrians who look into classical conditioning usually also learn about operant conditioning. Classical and operant conditioning work hand in hand, serving complementary yet distinct purposes. "Making a learned association (classical conditioning) is one of the most powerful means of teaching horses because it is involuntary," says Travis. It just happens automatically. "That is a big difference from operant conditioning, where the learning is voluntary."

She further explains the difference between the two learning methods:

- **Classical conditioning:** involuntary associations made with previously neutral stimuli.
- **Operant conditioning:** voluntary actions maintained or dissuaded through consequences.

Operant conditioning is divided into four quadrants:

| Positive Reinforcement/Reward | Negative Reinforcement/Reward |
|-------------------------------|-------------------------------|
| Positive Punishment | Negative Punishment |

In operant conditioning, the goal of reinforcement (or reward) is to make a behavior more likely to happen again, and the goal of punishment is to make a behavior less likely to happen again. "In this context, positive and negative don't mean good or bad," says Travis. "Instead, positive means 'adding' and negative means 'removing' a stimulus."

She gives us a real-world example: "You are longeing your horse in the round pen with a longe whip and tapping him on the butt if he breaks from the trot into a walk. That is positive punishment (operant conditioning)—as well as negative reinforcement, because you're removing the stimulus when the horse does the desired task—and you are also creating a negative learned association to the whip in the process (classical conditioning)." As this scenario demonstrates, the two types of conditioning are often intertwined during the learning process.



Through target training, Shelby Dennis uses classical and operant conditioning to teach the horse to associate touching a particular object with a reward. | Courtesy Carleen Geisler

3. Is Clicker Training a Form of Classical Conditioning?

The short answer is yes. “Clicker training uses classical conditioning to teach the horse to associate a reward with a specific sound, oftentimes a clicker or another auditory signal such as ‘Yes’ or ‘Good,’” explains Dennis. Specifically, trainers use classical conditioning in the “bridging” phase of clicker training, where the horse learns to associate the “click” noise (or the verbal praise) with a positive outcome: “Click means I did good, and a reward is coming.” Generally, this reward is food.

Once you’ve established this chain reaction in the horse’s brain, you can then use operant conditioning to produce the desired behaviors. Each time the horse offers the correct answer, you produce the “click” noise, letting him know he did the right thing. In this instance, you’re using classical conditioning to offer positive reinforcement during operant conditioning.

Our sources describe clicker training as an effective, stress-free, and force-free method of training your horse. This being said, criticism of the technique lies in the fact that horses can become frustrated if the food reward is withheld and develop nipping or biting behaviors as a result.

4. How Can I Use Classical Conditioning to Improve My Horse's Training and Welfare?

At the most basic level, optimizing equine welfare during training involves minimizing stress and frustration for the horse and reducing the trainer's need to use positive punishment. These two things often go hand in hand. Effective stress-free training methods can also improve the speed and quality of the horse's learning process. "Clicker training specifically has welfare benefits because it provides clarity in training for the horse and allows the trainer to mark the exact moment the horse engages in the correct behavior, making it far more clear and easy for the horse to replicate the desired behavior time and time again," explains Dennis. "This precision in timing helps to mitigate the risk of confusion, as it very clearly tells the horse what the desired behavior is."

Because associative learning is involuntary, it can even help horses overcome their fears. "Classical conditioning can be used to help organically teach horses to have positive associations with certain tasks by pairing an appetitive reward with a stimulus that they previously may have been afraid of, such as a loud noise or specific sensation," says Dennis. This means essentially "rewiring" the brain. "When a desired stimulus is consistently paired with a previously neutral or potentially aversive stimulus, it

Through Associative Learning, Horses Can Communicate Their Preferences

In 2014 a group of researchers created buzz by claiming horses could tell their handlers when they wanted to wear a blanket (TheHorse.com/149916). The innovative study demonstrated that handlers could use a combination of classical and operant conditioning to effectively teach horses to make choices. The researchers presented study horses with a choice to wear a blanket at different environmental temperatures. Within two weeks, all 23 of their equine subjects had learned to associate previously neutral visual symbols with the following actions: put blanket on, take it off, or stay unchanged. By recognizing and selecting the symbol of their choice, the horses could communicate their preferences. Our sources say this type of associative learning has unprecedented potential in terms of improving both equine welfare and the horse-human relationship. Imagine if, rather than guessing if your horse wants to come in or stay out for the night, or be turned out with buddies or alone, you could just ask him?

can help create a positive new association for the horse and thereby mitigate fear, frustration, and other unpleasant feelings on the part of the horse.” In practice, this can look like giving a treat to your spray-bottle-fearing horse each time you apply fly spray. Soon enough, his brain will learn to associate the spray sound and feeling with the food reward, and satisfaction will replace the fear.

“Seeking a reward is always more desirable and powerful for the horse’s brain than avoiding an aversive punishment,” adds Travis. “With punishment, the stress response of the central nervous system is activated. And if an animal’s fight or flight response—created by the sympathetic nervous system or SNS—is engaged, then his brain will shift all focus and energy away from learning and retaining information and place it on safety and avoiding danger. Animals can only learn and process information when their brain is in a (relaxed) parasympathetic nervous system state.” This is why trying to train a stressed, flighty horse is both ineffective and counterproductive, she says, not to mention potentially dangerous.

Using reward-based training, incorporating classical conditioning into your horse’s education, you can make training not only safer and more effective but also fun. Equestrians use clicker training to teach horses all sorts of tricks, from bowing and lying down to picking up objects. Travis has her own creative use of this training tool: “I play a different song on a loudspeaker for each of my horses. Each horse knows his individual song and comes into the arena when hearing it—that’s classical conditioning at work. I have different songs for other situations such as mealtime, hoof trimming, grooming, etc. The behavior of recalling (coming into the arena) when the song is played is voluntary and falls under operant conditioning, but the physiological responses they experience when the songs are played is involuntary and are considered classical conditioning.”



Classical conditioning, as Alex Travis demonstrates here, can help owners teach horses to have positive associations with tasks by pairing rewards with stimuli they feared previously. | Courtesy Maureen Friedly, Foxtrot Photography

5. Can Classical Conditioning Be Misused?

Conditioned reflexes become just that: reflexes. Anyone who's tried to get rid of a bad habit knows how difficult it can be to break those involuntary, repeated actions. "As a behaviorist and trainer, I can confidently say that undoing negative learned associations is the hardest part of my job," says Travis. "Sometimes it isn't even possible, in part because an animal has absolutely no control over involuntary responses."

Classical Conditioning Can Help Animals

'Talk'

Dog and cat owners worldwide are catching on to a popular trend: teaching their pets to use "voice buttons" to communicate. You can purchase commercially available kits and customize the prerecorded words. The buttons are recognizable to the animal through pictures, symbols, and/or location on a floor

As prey animals, horses are naturally equipped with a strong survival instinct. It sometimes takes a single negative experience to create a permanent aversion. Take, for example, a jumper crashing through a liverpool (an obstacle built with water) and being terrified of blue tarps and water jumps for life. That's why you must perform associative learning carefully and intentionally.

Final Thoughts

Classical conditioning can be both exciting and empowering as an equine training tool. You can use it to create conditioned reflexes that become second nature to your horse, allowing you to rewire his brain and shape his actions. Our sources say that by prioritizing rewards, associative learning is a welfare-friendly tool that improves the learning experience for both horse and human. Not to mention, it can be a great way to bond with your horse and teach him fun tricks.

mat. Training the pet to use the buttons requires bridging the word to a specific object, activity, or feeling. For example, a dog could have buttons for outside, play, water, and their owner's name. In more advanced scenarios they can even use buttons to convey emotions, such as pain ("ouch") and anger ("mad"). Researchers at the University of California, Davis, are currently studying the validity of this practice and have so far concluded that at the very least, dogs' pressing of buttons is not random. Because horses are also capable of associative learning, this technology could be developed for equine use to improve communication between horses and the people who care for them. On social media platforms you can find horse owners using buttons in an attempt to train their horses to communicate basic concepts.

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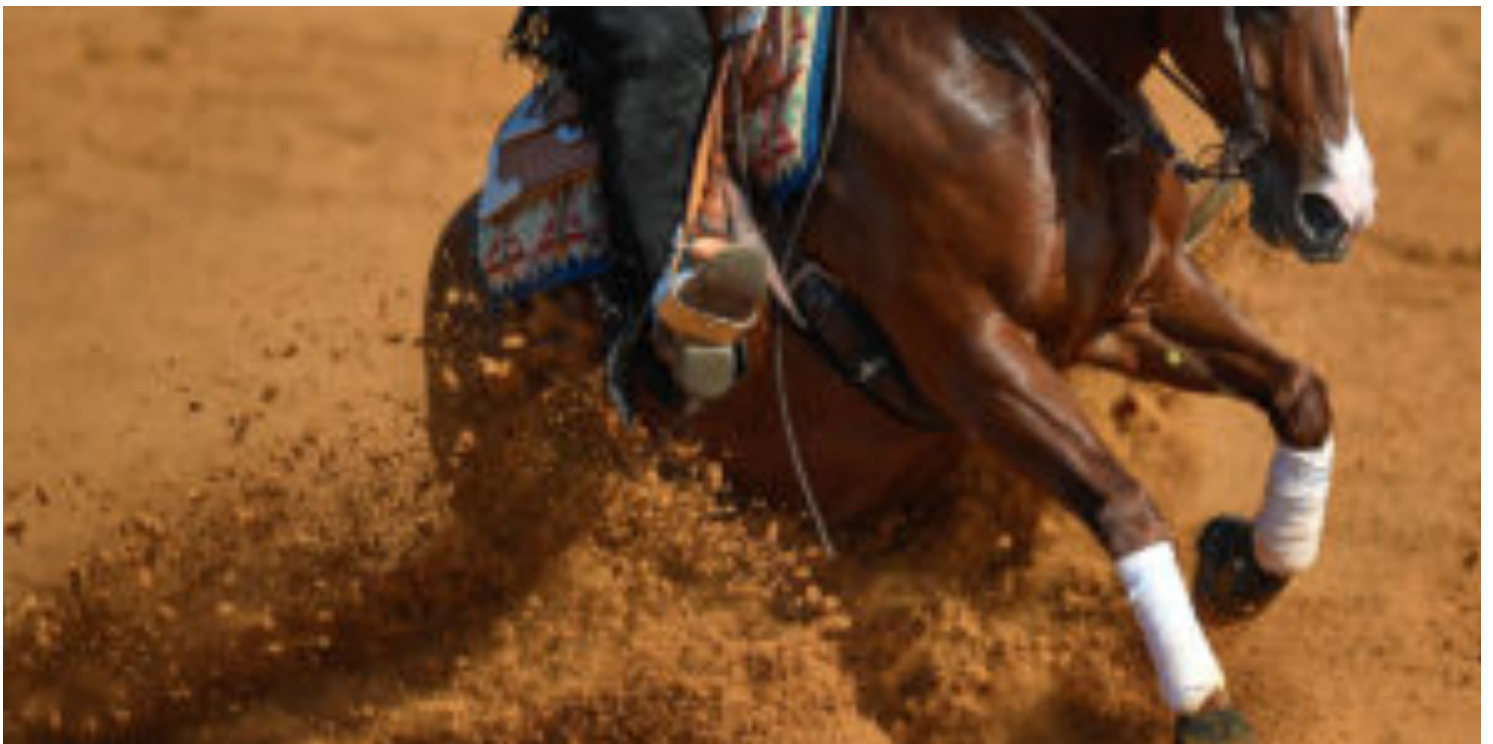
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