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Interaktioner mellan häst och ryttare som leder till ett positivt förhållande

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Abstract

Horse riding is among the most dangerous sports, with more accidents happening than both football, motorcycle riding, rugby and skiing. The frequency of accidents increase with the frequency of being around horses (*Equus ferus caballus*), regardless of how experienced the rider is. This indicates that even professional riders are in the risk zone. The aim of this review is to clarify the factors affecting the interaction between horse and rider, and to investigate which training methods are most useful when training horses. This review concludes that the outcome of the interaction between horse and rider is affected by many factors, such as the riders seat and position, choice of training method, right equipment and knowledge of basic horse behavior. The interaction is also affected by the behaviour of the rider, which needs more research in future. This review also concludes that horses can be trained both by positive and negative reinforcement, but punishment should be avoided.

Sammanfattning

Ridning är bland de farligaste sport, med fler olyckor händer än både fotboll, motorcykel, rugby och skidåkning. Frekvensen av olyckor ökar med frekvensen av att vara runt hästar (*Equus ferus caballus*), oavsett hur erfaren ryttare är. Detta tyder på att även professionella ryttare är i riskzonen. Syftet med denna rapport var att klargöra vilka faktorer som påverkar interaktionen mellan häst och ryttare, och undersöka vilka träningsmetoder som verkar bäst vid träning av hästar. Denna rapport drar slutsatsen att resultatet av interaktionen mellan häst och ryttare påverkas av många faktorer, såsom ryttarens sits och position, val av träningsmetod, rätt utrustning och kunskap om allmän häst beteende. Interaktionen mellan häst och ryttare är också påverkad av ryttarens beteende, vilket behöver mer forskning i framtiden. Denna rapport drar också slutsatsen att hästar kan tränas med båda positiv och negativ förstärkning, men att straff bör undvikas.

Introduction

Horse riding is a popular sport with many people being around horses every day. Horse riding is also referred to as equitation, in which the horse's movements are controlled by the rider. The rider applies signals through his/her weight, pelvis, hands and legs in order to make the horse move in a given direction or in a specific way (e.g. speed, gait). A well ridden horse responds to very light signals performed by the rider (McGreevy, 2007; Zetterquist Blokhuis *et al.*, 2008). To achieve a well ridden horse, it has been suggested to achieve a good and positive relationship with the horse. A relationship between humans and horses are based on several interactions between them. The outcome of these interactions will lead to either a positive or a negative relationship. Such relationship between horse and rider is an increasing interest among riders, but also a relatively new field of science (Hausberger *et al.*, 2008; Sankey *et al.*, 2010).

Not only is the relationship between horse and rider interesting, an improvement of this is also necessary, since horse riding has been reported to be among most dangerous

sports in the world. Studies shows that more accidents are happening in horse riding than in for example football, motorcycle riding, rugby and skiing when comparing all accidents reported at English emergencies for the last 20 years. Horse-rider related injuries has been reported to be most common as a fall from the horse, because the horse been spooked, or because the horse has been told to perform a task outside it's skill set (Ball *et al.*, 2007). The frequency of accidents increase with increased times spent among horses, regardless of how experienced the rider is, which indicates that even professional riders are in the risk zone (Ball *et al.*, 2007; Hausberger *et al.*, 2008). This may indicate that the cause of accidents is lack of knowledge among riders, both professionals and non-professionals. Many accidents can be avoided if the rider better understand basic horse behaviour, and thereby is able to predict the horse's reaction in a given situation (Ball *et al.*, 2007; Hausberger *et al.*, 2008).

Before working on positive interactions with the horse, it is important to make sure the equipment such as saddle and bridle fits the horse, since they are the contact points between the horse and rider. The saddle must fit both the horse's back and the rider's seat (Greve & Dyson, 2013). A badly fitted saddle can disturb the movement of the horse, cause pain and in the end result in a negative interaction between the horse and rider (de Cocq *et al.*, 2004).

In 2008 Hausberger et al published a review of the human-horse relationship. In the review achieving, developing and improving a relationship between horse and human was investigated. It was concluded that a relationship between horse and human is built of a succession of interactions, and that negative input from the human to the horse should be avoided. It was also concluded that developing an attention to the horse behaviour is important, when decreasing accidents among horse and human. The review describes a need for more research, and that training the human working with horses can improve the relationship between them.

Therefore this review will focus on the interactions between horse and rider, and how these lead to a relationship between them. Since interactions between horse and rider occur both in and off the saddle, both situations will be mentioned, but with focus area on riding. The following questions will be discussed: Which training method (reinforcement and punishment) is more successful in horse training and can thereby improve the relationship between horse and rider? How should the rider behave in order to improve or maintain a good relationship? What has happened in this field of research since the review by Hausberger et al (2008)?

Horse ethology

In the wild horses live in harems, which consist of one stallion, several mares and their offspring. Stallions without harems live in bachelor bands, which include several stallions. The dominant mare or stallion will lead the activity of the day, deciding when

it is time for rest, grazing, drinking etc. (McDonnell, 2003, pp 12-25; Fraser, 1992, pp 184-191).

Horses communicate through a range of senses: visual, auditory, tactile and olfactory (McDonnell, 2003, p 16). Visual communication includes facial expression, ear and head position. These expressions are used when horses are nearby or in the herd, in visual distance to each other. Auditory communication is another expression including vocalization, grunts and other sounds made with the hoofs such as scratching. Vocalization occurs mainly between stallion and mare, foal and mare or between bonded horses if they are separated. Tactile communication is also an important part of horse communication, especially among foals, youngsters and mares. When horses pass each other, they often reach out to touch each other. Horses also use olfactory (i.e. smell) to communicate with each other. This includes urine, feces and breath odor (McDonnell, 2003, p 16; Fraser, 1992, pp 63-64).

Horse rider relationship

The interaction between horse and rider belongs to the study of anthrozoology, in which the communication between animals and humans is investigated. Even though being a relatively new field of science, horse and rider interactions have captured both riders and researchers interest. The relationship between horse and rider depends on several aspects which are described in the sections below.

Rider's seat

A correct position and a good balance are essential in equitation. The rider uses its balance through the pelvis, to maintain a good posture. This makes the rider's pelvis of high importance, since it defines how well the signals between horse and rider are given (Greve & Dyson, 2013; Zetterquist Blokhuis *et al.*, 2008; Münz *et al.*, 2014). As recently discovered in a study performed by Münz *et al.* (2014) the rider's pelvis flexibility affects the interaction between the horse and rider. The study was carried out on 20 riders, who were divided in two groups depending on their riding skills, either professionals or beginners. All riders had sensors at their pelvis to measure flexibility and posture of the pelvis during riding. The results showed that professional riders had more flexibility in their pelvis and tilted it more forward during riding than the beginners. This indicates that professional riders may be able to give a clearer signal to the horse than beginners. For that reason it is important to define a successful method for measuring the rider's seat, and thereby be able to improve it, which was the aim of a study performed by Zetterquist Blokhuis *et al.* (2008). The study was carried out on 20 riders, divided in two groups, an experimental group performing an individual training program and a control group. The individual training program included use of a Balimo stool, a chair with a flexible seat used to strengthen and improve the flexibility in the pelvis. The groups rode two dressage tests with nine weeks interval and had the same

judges to score the two dressage tests. The results suggest a need of better methods to assess the riders' seat, since the results were not clear.

However in 2013 Greve and Dyson performed a review in which they discussed the horse-saddle-rider interaction. In the review they compared and summarized different measurement technologies for rider's seat, including several pressure mats. It was concluded that technology such as pressure mats, muscle activity measurement and other data can be used to improve the riders' seat and thereby improving the interactions towards a positive relationship between the horse and rider.

Training methods

Reinforcement

Horse riding and training of horses in general is reliant on negative reinforcement (Goodwin *et al.*, 2009; McGreevy, 2007; Waran *et al.*, 2002; Sankey *et al.*, 2010). Negative reinforcement is the avoidance of an unpleasant condition, by performing a definite response (Waran *et al.*, 2002). An example is when the rider wants the horse to move in a given direction, he/she puts pressure on the horse (either by the rein or leg) and when the horse responds to this and moves away from the pressure, the rider will release the pressure immediately. Positive reinforcement is often used when training many other animals such as dolphins (*Delphinoidea*), seals (*Pinnipedia*), bears (*Ursidae*) and other zoo animals. It includes a positive event when the animal does correct and an ignorance of mistakes or errors made by the animal (McGreevy *et al.*, 2009). Positive reinforcement is still a new training method among horses, but studies show that it can help building a positive relationship between horse and rider as concluded by Sankey *et al.* (2010). The study showed that a positive relationship between horse and rider can be achieved by repeated positive reinforcement during training. The study was carried out on 23 horses. The horses were divided in two groups and went under a training program either by using positive reinforcement (food reward) or no reinforcement (control group). The horses started their first training session at an age of one, which included brushing, lifting feet, stopping, get boots on tendons, vapour spray on whole body etc. The next six months the horses went on pasture with no human contact. After six and eight months the horses went through a memorization test, to analyses how comfortable they were around humans. Results showed that horses trained with positive reinforcement showed more positive behaviour towards humans than horses trained with no reinforcement. Horses trained with positive reinforcement also used less time learning a new task than the control group.

In 2008, Innes and McBride performed a study in which they compared positive versus negative reinforcement on 16 Welsh ponies. The ponies were divided in two groups, and received either positive or negative reinforcement. The aim of the study was to evaluate a training strategy for rehabilitated horses, and all 16 Welsh ponies had been rescued from abandonment and starvation. The training went on for seven weeks.

Ponies trained with negative reinforcement were trained to avoid pressure by the application of a riding whip. The ponies trained by positive reinforcement were clicker trained, in which they received a food reward for correct behaviour. The results suggest that ponies trained with positive reinforcement are more motivated to participate in training than ponies trained with negative reinforcement.

Punishment

Punishment can be divided in two categories: positive and negative. As McGreevy et al (2009) concluded in a review positive punishment is mostly used when handling horses. Positive punishment includes kicking, punching, slapping, whipping etc. the horse in order to prevent it from performing an unwanted behaviour. Negative punishment includes a withholding of something positive, for example food. Such punishment is not usually practiced when training horses (McGreevy *et al.*, 2009). However punishment is a difficult method to use when training horses, since the punishment must be given within a second or two after the unwanted behaviour to be effective (Waran *et al.*, 2002). Similar results are shown in an internet study performed by Hockenull and Creighton (2013). This study also indicates that riders do not agree on how to respond when horses behave inappropriately and that punishment does not decrease the inappropriate behaviours of horses. These results are based on an Internet research with questions about riders and their response to horses. 131 riders participated in the research.

Sympathetic and conventional training

Sympathetic training of a horse refers to a training, in which the horse' behaviour and ethogram is respected, since the rider uses body language to communicate with the horse (Waran *et al.*, 2002). Such training method is new, but receives much attention from horse owners who wants to train their horses in a more natural way (Polito *et al.*, 2007). Conventional training refers to a more traditional training, in which the horse behaviour and ethogram is less respected. Traditionally training often relies on prescheduled tasks decided by the owner or trainer. In 2009 Visser et al performed a study in which they compared sympathetic and conventional training on young horses. 28 young horses participated. The horses were divided in two groups, and received either conventional or sympathetic training. The conventional training methods included a predetermined schedule in which the horses would be familiar with saddle and rider after two weeks, and ridden in the end of the third week. The sympathetic training was based on a freestyle training, developed by experienced riders. The horses were trained in ground work, avoidance of pressure, habituation, saddle and rider one by one, in a schedule matched to the individual horse. The results showed no difference in performance level after five weeks training between the two groups. The only difference was the lower heart rate among the horses trained in sympathetic training methods, which may indicate a higher welfare among those horses. The study thereby proved a lower stress level among the horses trained sympathetic. Similar results were shown in a

preliminary study performed by Fureix et al (2009), in which horses were handled either by natural horsemanship or traditionally. Natural horsemanship is a training method inspired by observing horses in the wild, and copying their behaviour, by using body language to communicate. 12 horses were divided in two groups, and handled either by natural horsemanship or traditionally. The natural horsemanship handling included desensitisation, yielding to body pressure, lunging and free lunging. The traditionally handling included halter leading, grooming, lifting feet and lunging. The results showed that horses handled according to natural horsemanship showed less reactivity and responded more positive towards new tasks than horses handled traditionally. Therefore the results suggests that natural horsemanship can improve the relationship between horse and human, since natural horsemanship is based upon positive interactions.

Behaviour of rider and horse

The personality of both human and horse can affect the the relationship between them (Keeling *et al.*, 2009; Visser *et al.*, 2009). A nervous human can cause the horse to become more reactive. This was concluded in a preliminary study by Keeling et al (2009). 27 horses and 37 people participated in two different tests including riding and leading the horse between two points A and B at 30 m distance. Heart rates were measured on both humans and horses. The test was repeated four times, and at the fourth time the participants were told that an umbrella would be opened at point B, but no umbrella would do so. Even so, both human and horse heart rate increased when reaching point B. Since no umbrella was opened, the horses did not get afraid of this, and the increased heart rate of the horses depended on the humans' reaction. Many riders/leaders shorten the reins, or acted differently toward the horse at the fourth test when expecting the umbrella to open. This caused the horses to respond more anxious at the fourth test. As shown in the study, it is important to stay calm and focused when being around horses, since they respond to the humans behaviour (Keeling *et al.*, 2009).

Not only the humans' behaviour affects the relationship, also the horse affects it. A study performed by Visser et al (2008) showed that reactive horses are more susceptible to changes in their environment. The study was carried out on 16 horses and 16 riders. In the beginning of the study all riders had a personality test (answering a questionnaire), and all horses went through a novel object test and a handling test. The novel object test included measuring the horse heart rate when being on its own in a familiar riding arena with an umbrella lowered from the ceiling. The handling test also included measuring the horses' heart rate, this time when being followed by a handler over some plywood plates. All riders rode each horse, and the rides included jumping a small fence, trotting a serpentine, walking across wooden panels and walking next to a recording of a chain saw. An external judge scored the cooperation of the equitation as did the rider. The results showed that horses scored as reactive in the novel object test and the handling test seem more sensitive to ride. Further the riders' assessment of the equitation was influenced by the frequency of evasive behaviour done by the horse,

which means that the horse was scored more poor based on its evasive behaviour during riding.

Discussion

Münz et al (2010) showed that experienced riders tilt their pelvis more, and thereby follows the movements of the horse better, but it is not enough to avoid conflict between horse and rider. Zetterquist Blokhuis et al (2008) conclude that finding a method for assessing the riders' seat is difficult and that further studies are needed. In the review by Greve and Dyson (2013) a variety of pressure mats are discussed in use of measuring the riders' seat and balance. Such pressure mat can be useful when measuring such difficult part as the pelvis. Better results might have been shown in Zetterquist Blokhuis et al (2008), if the study had used equipment as a control to measure the riders seat, like in the study performed by Münz et al (2014). This may have decreased the bias. The study by Zetterquist Blokhuis et al (2008) is older than both the studies performed by Münz et al (2014) and Greve and Dyson (2013) so it might be expected that such measuring techniques have not been tested very well in 2008, or simply has been developed after. The author has not investigated any further on equipment or measuring technology. It is the author's opinion that use of equipment such as pressure mats can be useful in riding schools, when teaching a correct seat. This may help the riding teacher and the student to define the flexible and correct seat in a more effective way than just visualising and practising it.

Training horses relies on reinforcement. Traditionally negative reinforcement has been used exclusively on horses, but training positive reinforcement has began, since many other animals respond well to this. The study performed by Sankey et al (2010) is such a research. In this study the horses are trained with positive reinforcement. The study did show that horses response well to positive reinforcement, meaning that this training method can be useful if performed correctly. Goodwin et al (2009) concludes that negative reinforcement provides minimum stress for the horse, when being exposed to new things and tasks. Therefore both negative and positive reinforcement can be used when training horses. In the study by Innes & McBride (2008) positive and negative reinforcement is compared, showing that horses are more willing to participate in training when being positive reinforced. According to the author, there has been done no research on positive reinforcement when riding, but only from the ground. It is possible to believe that positive reinforcement may have some limits when being on top of the horse. First of all the reward must be given to the horse within few seconds to have an effect, which can be difficult when practicing tasks in trot or canter. Secondly it is possible that the horse might experience the reward differently than expected. If the horse performs a task in canter, and the rider wants to reward this task, the rider must first stop the horse before being able to give the horse a treat. The horse then might experience the reward for stopping and not for the task it performed in canter. This is in agreement with the results in the review by Goodwin et al (2009), where it is indicated

that reinforcement is useful only when knowing how to perform it correctly within short time. It would be interesting to see more research on positive reinforcement on horses in the future, and investigating possibilities and effectiveness of positive reinforcement when riding.

If the horse behaves inappropriate many riders tend to punish the horse. However punishing the horse has not shown any decreasing in inappropriate behaviour (Waran *et al.*, 2002; Hockenhull & Creighton, 2013). This may be due to the fact, that horse owners simply do not agree on when the horse behaves inappropriate, and that one behaviour can have many definitions according to different people, as concluded in the study by Visser *et al* (2008). This makes the results of the Internet study performed by Hockenhull & Creighton (2013) less reliable, since all 131 participants may define inappropriate behaviour differently.

However it is important to have in mind that horses are not evolved to carry a rider on their back. As concluded in a review by McGreevy *et al* (2009) horse riding is not similar to any other natural occurring behaviour in the equine ethogram. Therefore horse riding should be performed with knowledge and calmness to provide a safe environment for both the horse and rider. When being on top of the horse, visual communication is no longer possible, which is one of the main communication skills of horses (McDonnel, 2003, p 16; Fraser, 1992, pp 63-64). The rider will perform mostly tactile communication, which includes the riders' hand, legs, weight and especially the pelvis (McGreevy, 2007; Zetterquist Blokhuis *et al.*, 2008). Many new training methods claim to train the horse more natural, in the term of natural horsemanship or sympathetic training. It is the authors opinion that these training methods show good results, and that horse behaviour should be part of the riders knowledge.

In the review by Hausberger *et al* (2008) it was concluded that humans needed more training when being around horses to improve the relationship between them. To the authors knowledge only little has been published in this field of science. In a short Communication by Keeling *et al* (2009) it was concluded that horses react if the rider is nervous. This indicates a tendency that horses react differently towards humans whether they are showing confidence or nervousness, but much more research is needed. This means that very little has been published since the review by Hausberger *et al* (2008). However new training methods seem to have evolved since 2008. Such training methods are referred to as sympathetic, in which the horse and rider communicate through body language. The author has not been able to find any evidence of differences in natural horsemanship or sympathetic horse training, and it is therefore possible to believe that these two training methods are the same, but with different names.

According to the author, improving and maintaining a positive relationship between horse and rider is caused by many factors such as the equipment like saddle and bridle (Greve & Dyson, 2013), the riders position and seat (Zetterquist Blokhuis *et al.*, 2008; Münz *et al.*, 2014), the choice of training method (Fureix *et al.*, 2009; Polito *et al.*,

2007) and the behaviour of both rider and horse (Keeling *et al.*, 2009; Visser *et al.*, 2009). In the review by Hausberger et al (2008) it was also investigated that the relationship between horse and human is affected by the interaction occurring in the past between foal and human, but no further investigation has been done by the author in this review. It is clear that the relationship between horse and rider is not only affected during the equitation, but with all contact between horse and human, both in and off the saddle. Therefore understanding the horse behaviour can help improve the relationship between horse and rider, and might avoid possible accidents in the future.

Conclusion

This review concludes that a positive relationship between horse and rider is based on a series of positive interactions. Both negative and positive reinforcement can be used when interacting with horses. Newest studies suggest that positive reinforcement is most successful when aiming for positive interactions, but more research is needed. However punishment should be avoided when interacting with horses. Further a positive relationship between horse and rider is caused by many factors such as the rider's seat and position, choice of training method and the behaviour of both horse and rider, and the rider must remain calm and focused when being around horses.

More research is still needed about riders attitudes towards horses as published in the review by Hausberger et al (2008), and only very little has been done since.

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