# Fear reactions in riding horses

## A comparison between dressage and show jumping horses

by

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## Contents

## Abstract

It is common knowledge among "horse people" that dressage horses are more easily spooked and more skittish than show jumping horses however, to my knowledge, no scientific research has been made earlier to test this assumption. It is also important to have the right horse-rider combination in different situations to avoid accidents. Many horses that are bred to become Grand Prix horses never succeed all the way up but end up with a beginner rider on the road with traffic and other stimuli, which can result in accidents due to the wrong horse-rider combination in the wrong situation. Thus a horse that might work well in a competition arena with a professional rider may be considered easily spooked and skittish when combined with a less experienced rider in a completely different environment.

Both the horse's physical capabilities as well as its temperament affect the optimal performance of the horse. So far the main focus in equine research has been related to predicting final performance and the physical ability of the horse. Nevertheless, during the last couple of years, research in horses' fear reactions has increased. Hopefully this will eventually also lead to better performance, as well as a better human-horse relationship and fewer horse related accidents.

The aim with this experiment was to investigate whether training - young unbroken versus competition horses, and/or genes - dressage versus show jumping lines, affects how horses respond to fear stimuli. The stimulus in this study was a large, black plastic garbage bag. It was placed on the ground, obliquely behind and about 8 metres from the bucket with oats where the horse was standing. The plastic bag was pulled with a string by an observer so it moved about one metre. In this paper only the horses' visible behavioural reactions to the stimulus were analysed due to time constraints.

Thirty-two riding horses were included in this study, 15 in the dressage group and 17 in the show jumping group, their education levels were from just minimally handled to training Grand Prix movements. To be allowed to be part of the study the horse's training status and its Sire's BLUP-index were considered.

The results showed significant differences in reaction vigour between dressage horses and show jumping horses of all ages with the dressage horses reacting more. There were some non-significant differences between the age groups within each discipline.

In conclusion, these results suggest that genetics has a more important role in how strongly the horse reacts than does its training and that horses of dressage lines are more reactive than lines of show jumping horses.

I would find it really interesting if someone could continue this work, comparing dressage and show jumping horses, but in a larger experiment, with the improvements mentioned in the discussion. If so, the results might help us move one step closer towards a mentality test for horses, which could help us prevent further horse related accidents by assisting us to pick the right horse for the right situation and rider.

## Sammanfattning

Det är allmänt vedertaget bland hästfolk att dressyrhästar är mer lättskrämda och harigare än hopphästar. Dock är det inte enligt min vetskap, vetenskapligt undersökt om så verkligen är fallet. För att undvika olyckor så är det viktigt att man lyckas kombinera rätt häst med rätt ryttare i olika situationer. Många hästar som man avlar fram för att de ska tävla Grand Prix kommer aldrig så långt, utan de hamnar med en nybörjare längs en väg med trafik och andra faror. Detta kan resultera i olyckor på grund av fel kombination av ryttare-häst och miljö. Följdaktligen kan en häst som fungerar väl på en tävlingsarena med en professionell ryttare anses vara lättskrämd och besvärlig om den kombineras med en mindre van ryttare i en helt annan miljö.

Både hästens fysiska egenskaper och dess temperament påverkar hästens optimala prestation. Fram till idag har forskningen framför allt fokuserat på hästens fysiska egenskaper vad gäller hästens slutliga kapacitet. Under de senaste åren har man dock börjat titta mer på hästens rädslebeteende och förhoppningsvis kommer detta i förlängningen att leda till en bättre människa-häst relation och därmed till färre hästrelaterade olyckor.

Målet med denna studie var att få en indikation på om träning och/eller gener påverkar hästens rädsle beteende. Stimulit i detta försök var en svart sopsäck som låg på marken ca 8 meter snett bakom hästen som i sin tur stod och åt ur en hink med havre. Säcken förflyttades snabbt längs marken ca en meter med hjälp av ett snöre som drogs av en medhjälpare. I denna studie var det bara hästens visuella beteende som analyserades på grund av tidsbegränsning.

32 ridhästar var inkluderade i studien, 15 dressyrhästar och 17 hopphästar. Deras utbildningsståndpunkt var allt från knappt hanterade upp till Grand Prix nivå. Kriterierna för att få ingå i studien innefattade hästens träningstatus samt faderns BLUP-index.

Resultatet visade signifikanta skillnader i hästarnas reaktion. Dressyrhästarna reagerade mer oavsett ålder och träningsstatus. Det var några skillnader mellan grupperna inom respektive disciplin men inga skillnader var signifikanta.

Sammanfattningsvis så tyder dessa resultat på att genetiken verkar spela en större roll än träningen i hur mycket hästarna reagerar samt att hästar med dressyrblod reagerar mer än hästar med hoppblod.

Jag skulle tycka att det vore mycket intressant om någon kunde fortsätta denna studie, men i ett större perspektiv och med de förbättringar som jag nämner i diskussionsdelen. Med liknande resultat kan dessa kanske leda oss ett steg närmare ett bra mental test, som i sin tur kan hjälpa oss att finna rätt häst till rätt ryttare och därmed förhindra en del hästrelaterade olyckor.

# 1. Introduction

## *1.1 Evolution*

Evolution proposes how modern day life has come to be and how it might change in the future. It explains how both structure and behaviour are related to the environment, and is the consequence of a continuous process of adaptation. Evolution does not drive change; it merely describes the changes, which take place. It can only exist if genetic mutations arise on occasion in the population, giving a variety from which natural selection can have its turn. In the nineteenth century, there were two main theories as to how evolution might occur, the Lamarckian theory and the Darwinian theory. It is however only the Darwinian that is accepted in our time.

### *1.1.2 Darwinian theory*

Charles Darwin and Alfred Russel Wallace suggested the following to explain evolution:
*Variability*- there is variation in between individuals in a population, *heritability*- some abilities are heritable, *competition*- you have to compete to survive and the fittest survive, *natural selection*- environmental pressures affect some individuals more than others so it is not completely random who survives or not.
*Adaptation*- the individuals that are best adapted to the environment live longer and produce most offspring with their heritable traits. (Darwin 1859)

For example, the horse did not develop longer legs so that it could escape predators, but those with long legs could run away and escape from the predators and passed this trait on to their offspring. Thus over generations a population will change and adaptive evolution will occur as a result of natural selection.

Darwin´s theories were modified by Dawkins a hundred years later and the modification was that Darwin's ideas should be applied at the genetic level instead of the individual. Dawkins argued that the individual is merely a vehicle for the gene to produce more copies of itself. (Dawkins 1976)

### *1.1.3 Evolutionary changes*

We can see certain general aspects and traits that have changed in the horse throughout evolutionary history:

Development and specialisation of certain areas of the brain to smooth the progress of learning and the processing of sensory information, increase in body size, fewer toes and the development of hooves, proportionally longer legs and finally fusion of certain bones in the distal extremities and specialization of the locomotor system to make the gaits more efficient. (Waring 2003)

Some traits to facilitate the uptake of food have also changed over time; such as more efficient teeth for a more specialized diet, a longer, more slender muzzle to

facilitate selective browsing and eating habits, and development of hind gut fermentation.

The horse does not have many predators as it has developed to a fast, large animal. Its long legs and the fusion of some bones made the gaits more efficient. During evolution the horse has also become a more efficient grass eater that moves over large areas grazing most of the day.

Today we have discovered six species that are closely related to our modern horse; three species of *zebras*, two species of *ass*, one in Africa and one in Asia and the *Przewalski's horse*. This is the closest relative to our modern domestic horse (Podliachouk & Kaminski 1971), and probably the only true wild horse. Other horses found in the wild are almost certainly horses that have escaped from domestication.

During the ice age the horse population became isolated in different groups and developed and evolved separately, due to different environments. That is probably why our domestic horses have different genes, different appearance and temperament (Speed & Etherington 1953; Ebhardt 1957, 1962). For example, horses that were living in colder climates were robust, resembling today's draught horses, with large trunks and shorter legs and ears to keep the warmth better. Their fur was thick and their hooves were large so they could move in deep snow and wet grasslands. They had a long narrow skull with a roman nose to facilitate the warming of the air before it passes down into the lungs.

On the other hand, horses living in the southern hemisphere, where temperatures are higher and the climate drier, had appearances that made it possible to keep cool. The horses from these areas had longer legs and ears, a lighter more slender trunk and finer hair coat. They had smaller, harder hooves as they were walking on harder ground. These horses had faces more like our modern Arab, to help moisten the dry air when breathing.

## *1.2 The senses*

In this experiment the horses were exposed to a stimuli that they for the most part perceived through their vision and to some extent their hearing to localize and interpret.

### *1.2.1 Vision*

The horse has one of the largest eyes of any living animal (Waring 2003). They are placed laterally and far back on the skull enabling the horse to have a good wide view. Each eye has a horizontal visual field of up to 215º. This helped the horse to see predators approaching on the vast land and also keep an eye on its herd. An overlap of the eyes' visual fields occurs in front of the horse with about 60-70º (Duke-Elder 1958). It is in this binocular field that the horse can judge distances accurately. The horse can re-orient the binocular field by extending and turning its head. The horse has a blind field starting just below its nose and continuing behind it, and it has an arc of about 5º. The rider is situated in this blind field.

The horse has an ability to accentuate things that come into the margins of its visual fields. It overreacts and gets very startled to sudden movements on the ground if it happens in the periphery. That is probably a safety precaution towards any approaching predators. Sudden flight was the best defence. (Waring 2003).

Nocturnal vision in the horse is better developed than in humans. The horse, dog, owl and squirrel have similar light collecting power in spite of the difference in size of their eyes. The cat, rabbit, rat and bat rank higher. It is the higher proportion of rods than cones and the light reflecting tapetum lucidum that enables the horse is able to see in low light. (Waring 2003)

### *1.2.2 Hearing*

The horse can hear sounds from 60 Hz to around 33,5kHz (Heffner and Heffner 1985). We can, at our best, hear frequencies between 20 Hz to 20 kHz. This means that the horse can hear higher frequencies (ultrasound) than humans but not as low. Some of the horses' inexplicable agitation or "spookiness" may be related to sounds that are out of range of human hearing (Saslow 2002). The optimal range for the horse is between 2 and 5 kHz and this range includes most equine calls and also most human speech.

The horse can rotate its external ear towards the source of the sound, without changing the direction of its head. Its accuracy to find the exact source of the sound is not as good as for other animals though. One explanation for this could be that the horse has such a wide visual field that it does not have to have exact sound localization, as it scans the area with sight and sees any potential danger with minimal head adjustment.

The horse can protect its ears towards very loud noises by laying his ears flat back, because then it almost completely closes the ear canal.

## *1.3 Domestication*

Horses had long been used for food by humans and herds were often stalked and chased over cliffs. The herds diminished as a result, but domestication resulted in the survival of the species.

Domestication may first have occurred 3000 BC by an agricultural population in the western part of the European Plain in the valleys north of the Black Sea (Epstein 1971). These horses are thought to have possessed coarse features, more like the Przewalski's horse. Others have found that there might have been a relationship between horse and rider as early as 6000 years ago in the Copper Age, 250 km south of Kiev. Among artefacts that were found there, were pieces of antler that appear to be cheekpieces of a bit and a skull from a 7 to 8 year old stallion, whose lower premolar showed wear damage probably caused by a bit (Anthony & Brown 1991).

The technology for horse captures, taming and rearing was applied by each culture on the wild horses in their geographic area. The domestic horse population of today is a result of interbreeding of many lines of wild horses from multiple places (Vilá et al. 2001).

### *1.4 The herd and its social structure*

Most horses prefer to stay with companions. Distinct social groups are called bands. A herd is a localized population consisting normally of one or more bands as well as solitary individuals. Band size of free roaming horses is normally less than ten, with four being most common (Waring 2003).

Harem bands typically contain offspring of recent years as well as the adults, thus not all members of the band are reproductively active. The adults usually consist of one stallion and approximately three to four mares. Certain mares show very strong mutual attachment and preference for each other. The bands are relatively stable over time but changes do occur and females do not always remain together for life.

Less stable bachelor bands can be formed containing male youngsters, but bands of both sexes can occur. Membership usually shifts throughout the year and there are usually about four members. In the next sequences the different members of the herd are described.

#### *1.4.1 Stallion*

The stallion is the group–coordinator. He rounds up the other members, keeping them together, preventing them from straying as well as protecting the group from other stallions. He is often walking behind the herd. Sometimes the leader stallion has another stallion in his herd that helps him protect the herd against enemies. This stallion is usually not permitted to mate with any of the mares (Berger 1986).

#### *1.4.2 Mare*

Sometimes the oldest mare is the group leader and walks in the front (Ebhardt 1957; Zeeb 1958; Tyler 1972). One of the most important roles for the mares is to take care of their offspring. When the mare is close to foaling, she leaves the herd and comes back within a week with her new born foal.

#### *1.4.3 Foal*

The foal's first time in life can be divided into separate phases with regard to learning and formation of associations.

- *The neonatal phase* – during this phase the foal learns how to suckle, stand, walk and it also takes its first steps in being social. It identifies its mother and can also get acquainted to people if they are calm and do not upset the mare. A positive social contact with humans during this period is suggested to facilitate the horse-human bond later in life. (Miller 1991).
  This phase ends after about two hours, once the foal has nursed properly.

- *The transitional phase* – Usually extends over two weeks, it is the time of greatest sensory development. In practice it is during this time that the handler gets the foal accustomed to the clippers, blankets, weight on its

back (the pressure of your palms), different noises, cars, lifting feet, being led etc. (Miller 1991)

- *The socialisation phase* – it starts at about 4 weeks and extends to 12 weeks. Social play, mutual grooming, jaw snapping to show their inferiority, are some of the abilities that are developed.

- *The juvenile phase* – play and other activities to get ready for adult life become a bigger part of the foal's life. The play prepares the horse for its position in the herd.

### *1.4.4 Controllers*

An activity can be initiated by any member of the band and it often then becomes a group activity (Waring 2003). One horse can initiate when its time to drink, and this horse starts that activity and then the rest of the group follows, this horse is called a controller. If a subordinate horse initiates an activity, for example a change in location, it often stops, and lets a dominant individual take the lead (Tyler 1972).

### *1.4.5 Colts and fillies*

It is normal for colts and fillies to leave their mother's band any time after the first year. The colts may be forced away by the harem stallion and they tend to form bachelor groups. The fillies may stay longer and be very close to their mothers and may even help out with fostering their younger siblings. Otherwise they too can form separate groups, live solitary for a while or join other herds (Keiper 1976a; Goldschmidt-Rotschild & Tschanz 1978).

## *1.5 Behaviour*

### *1.5.1 What is behaviour?*

Behaviour is a means whereby an animal can adapt to its environment. It is the result of the interaction between the environment and genetics at any given moment in time. Behaviour will include all types of activities that animals engages in, such as locomotion, grooming, reproduction, communication etc.

### *1.5.2 Play*

Play behaviour seems to have a major role in the behavioural, social and physiological development of horses. Play provides a chance to obtain and try motor and social skills as well as social relations.
In horses play includes; solitary or group running, approach – withdrawal patterns such as alternative chasing, nipping and pushing and lastly tossing or manipulating of objects by mouth (Waring 2003).

Although play is characteristic of young horses, mature animals also occasionally play. With the exception of play between foals, locomotory and social play are normally restricted to horses within the same social group or with close relatives. Play is mostly often seen when all other needs are satisfied, there are no apparent

dangers, such as predators, and there is sufficient food and an amiable temperature.

### *1.5.3 Investigative behaviour*

Investigative behaviour is a necessity for the behavioural development of horses and is used when the animal is exposed to new objects, environmental situations or experiences. It permits the horse to be aware of its environment and not only to avoid dangerous things, but also to find requirements like water and resting sites.

Foals start with visual investigation already during their first hour postpartum.
Once the foal has successfully nursed, it starts exploring its nearby surroundings; its mother, the straw, the walls - it smells, it tastes, it touches them. The mother usually limits the foal's early social contacts and range of exploration.

Once the foal starts to play with other foals the opportunity for further investigation increases. Foals which experience neonatal handling and halter training tend to exhibit far greater exploratory interest and confidence than unhandled foals of the same age (Waring 1972).
The horse's investigative behaviour continues throughout the individual's lifetime.

### *1.5.4 Flight or fight*

The horse gets excited by sudden or unusual movements. They use these types of movements themselves, for example in threat displays, such as sudden jerks with their heads, fast strikes with their front legs, but also when they want other horses to start playing, in which case they move with a flying, stiff gait.

If something is occupying a horse's attention it can start by moving its ears in that direction and then, maybe, its head and if it does not feel comfortable, then it moves its whole body in the direction of the stimulus. The alert posture, consisting of an elevated neck with intently oriented head and ears and with nostrils sometimes slightly dilated, may induce similar alertness in neighbouring horses. By looking, listening, and smelling they test the situation (Waring 2003). Then usually one of the following events happen:

- *Flight* - the horse runs away. Reactions are swift and reflex-like. After the initial response, a horse usually appears to regulate its actions so as to meet the needs of the situation and not to be excessive in its flight response. In most cases of flight where locomotion occurs, the trot is the gait used in withdrawal. When extremely alarmed or pursued, a horse may use a gallop. Foals use gallop more often than the adults (Waring 2003).

- *Fight* - the horse stays and fights if it has to. Horses are not natural fighters but they do fight if they cannot get away or if they are defending their herd or foal. The horse usually shows an event of escalating threats before it actually starts getting involved in physical contact (Berger 1977).

- *Stay* - and try to reduce the tension in the situation by showing the appropriate behaviour, for example showing submissiveness. It can be by

lowering its head, tucking its tail between its hind-legs and either slowly moving in the opposite direction or standing still and perhaps just moving its rear in the other direction to show that it is not a threat. Young horses, three years or younger, show a specialized form of submissiveness called snapping (Tyler 1969). The horse initiates the behaviour by extending its neck, opening its mouth and pulling back the corner of the lips to some extent. Then it starts moving its jaws in a chewing-like motion, but rarely with contact between the teeth in the upper and lower jaw.

- *Approaching* - if the source of stimulation is stationary, the horse may be curious enough to move in its direction to explore. If there are social companions they usually proceed to investigate together as tightly clustered they can, with the dominant individual in the lead. The horse usually circles around the object instead of going straight at it, may blow air through its nostrils, paw with its front legs and defecate. If the stimulus does not seem to have become more threatening, the horse may trot a couple of steps closer, just to stop again and stare, until it finally reaches the object with an extended neck and its whole body prepared to run away if necessary.

The flight zone is the space around the horse which, if entered, makes the horse move away. It varies between different situations and individuals and seems to be greater if the horse is shy or very excited. Close companions are allowed to get into an individual's flight zone. The personal space is the area immediately around the horse. Here only close friends are tolerated and if anyone does approach this space, the horse usually responds violently or withdraws, as this is its final defence.

Working around the edge of a problem horse's flight zone is a useful way of controlling its behaviour when loose schooling.

### *1.5.5 Instinctive and learned behaviour*

There is a difference between instinctive behaviour, such as suckling and running, and learned behaviour like responding to signals while being ridden. The horse would not survive very long if it did not start suckling to get some milk from its mother's udder. Instinctive behaviour like this is relatively fixed and the hardware is already installed. It just needs the correct stimulus, for example the mother's belly, and some refining to work perfectly. Being ridden on the other hand, is something the horse must be taught and that takes much longer than learning how to suckle. It is also more affected by the environment.

## *1.6 Learning and training*

Learning is about gaining knowledge, not just changing behaviour. Learning is defined as a change in the potential to perform certain behaviour as a result of experience (Chance 1993). Training should involve social bonds and not punishment. Punishment is an inefficient training tool, as it does not specifically tell the horse what it should be doing, it just signals that one specific activity should not be performed. A horse with which we form a close mutual bond is in a

better state to respond to our request because of its natural tendency to cooperate with social partners.

Traditional texts refer to the processes of classical and operant conditioning as the basis for learning.

### *1.6.1 Classical conditioning*

Classical conditioning is also known as Pavlovian learning. This method is used to get an established behaviour to occur in response to a new range of stimuli. The example that is well known to most people, are the dogs that learned to associate a ringing bell with getting fed, eventually started to salivate as soon as they heard the bell even if there was no food around. An example in the horse world is when we go out in the fields calling our horse's name and shaking a bucket with food at the same time. Soon the horse starts to associate its name with food and comes in expectation to get fed.

### *1.6.2 Operant conditioning*

Operant conditioning describes the process of learning to do something differently. One study describing this is when hungry cats were put in a box where they had to press a lever to escape and get some food. The time taken for them to escape became shorter with experience, and eventually they learned to perform the behaviour as soon as they were placed in the box (Thorndike 1898). This is referred to as trial error and accidental success. This states that a response that is followed by a reward is more likely to reoccur whereas one that is followed by an unpleasant experience is less likely to occur again. This type of learning has many names; instrumental learning, operant conditioning and Skinnerian learning.

Reinforcement is an important term in operant conditioning. Reinforcement may be defined as those events following a behaviour which affect its future performance in similar circumstances (Mills & Nankervis 1999). Reward is an example of positive reinforcement; the behaviour performed just prior to the positive reinforcement is increased or repeated. In negative reinforcement, an unpleasant stimulus is applied until the animal performs the desired behaviour. The reward is then the removal of the unpleasant stimulus.

During training a horse's response to a given stimulus is positively or negatively reinforced by the trainer. An example of positive reinforcement could be to give a food reward to the horse when it puts its head in the head-collar, which makes it more willingly to do so.

Different authors have underlined the importance of learning ability in horses because the trainability and therefore utility of the horse to man are clearly linked to learning ability (Kratzer et al 1977, Fiske 1979; Mills 1998). Training involves suppression of undesirable natural responses, exploiting and modifying desirable natural behaviour and teaching novel behaviour, by combining the basic principles of learning with the horse's natural learning tendencies (Cooper 1998).

Unlike with dog training, horses are mostly trained with negative reinforcement, such as introduction of an unpleasant event to increase its willingness to perform a given behaviour. The horse learns to perform a certain behaviour to avoid an

unpleasant event, moving away from the pressure of the rider's leg or turning left when we apply a pressure on the bit with our left rein, are two examples. We have rewarded the horse's natural avoidance mechanisms in order to be able to use them to control him. If the horse is poorly schooled or given over to novices who fail to release the pressure of the leg accurately and consistently, then the horse may become "insensitive".

The practical and effective difference between punishment and negative reinforcement relates to the timing of the aversive stimulus in relation to the behaviour affected. In most circumstances, rewards should be provided within about half a second of the goal being achieved. (Mills & Nankervis 1999)

When a stimulus is presented so many times that the instinctive response begins to disappear, habituation is said to have occurred.

### *1.6.3 Training new behaviours*

When we want to teach a horse a new behaviour efficiently, we should aim to reinforce every occurrence of the behaviour initially, until it is established, and then move reinforcement onto an intermittent schedule. With an intermittent schedule it is possible to reward only the better examples of the behaviour. In this way the behaviour will be rapidly learned and remembered well.

### *1.6.4 Different training*

In Sweden there are many training methods and people attend clinics that our best riders and trainers have, and then they try to take the best parts to apply on their own horses. Although how different types of training are affected by the horse's temperament and learning abilities, and vice versa, has not being investigated scientifically.

Up to the age of four, at least for horses that participate in the competitions where their quality is judged (Kvalitetsbedömning), the education is rather versatile. This is due to the fact that during the "Kvalitetsbedömning" the horses' talents in both movements (dressage) and show jumping are tested. By this stage, most riders have probably already decided in what discipline their horse is most suitable. Sometimes it is the horse's talent that is decisive, sometimes it is the rider's preferences that determines in what discipline the horse will be further educated. There are already some competitions for the four year olds that are specialized, such as the "four year old championships", where the rider chooses if the horse is to be judged in its gaits or its show jumping skills.

At five years, the most talented horses will attend The Breeder's Trophy or Scandinavian Open and by then most horses are ridden in only one discipline. These competitions are rather advanced and most horses are neither sufficiently mentally nor physically mature, to be able to compete in several disciplines.
Leisure riders, on the other hand, with more average horses, do not have to participate in these specific competitions with their young horses and so their horses may be trained in dressage, driving, eventing and jumping, sometimes through out their whole lives.

### *1.7 Temperament*

Temperament has been defined as the individual's fundamental standpoint towards continuing changes and challenges in its environment (Mason 1984). Other authors include more detailed conditions in their definition like emotionality (Clarke et al 1996), or responses to handling (Fordyce et al 1988). Most relevant aspects of temperament for achieving an optimal performance are: emotionality, reactivity to humans and learning abilities (Visser 2002). All definitions of temperament include relative stability in responsiveness within individuals and therefore consistency over time and across situations (Plomin 1983; Zuckerman 1991).

Temperament can be associated to performance, for example in the different disciplines in competitions. Furthermore, objectively measured temperament would help a non professional to choose the right horse to match the rider's personality, existing housing conditions and management, or with the discipline in which the horse will be used (Mackenzie and Thiboutot 1997).

A questionnaire filled out by 826 horse owners in the Netherlands revealed that the most important temperament traits when selecting a horse were the willingness to perform and the eagerness to learn (Visser 2002).

Emotionality has been defined as the capability to observe and act in response to potentially unsafe situations (Boissy 1995). Fear and anxiety are the two emotional states that are induced by awareness of potential danger threatening the individual (Boissy 1995).

To test emotional reactivity of animals, the novel object test, originally developed for rodents (Archer 1973), is most commonly used. The individual is suddenly exposed to a new unknown object placed in the individual's otherwise familiar environment. The reaction to sudden innovation involves behavioural as well as physiological responses, for example changes in the position of the head and tail, changes in gait, specific movements of the eyes and ears and an increase in specific alarm related vocalisations. The level of corticosteroids in the circulation and changes in heart rate variables, are physiological changes that are often measured.

Both the horse's physical capabilities as well as its temperament affect the optimal performance of the horse. So far the main focus in equine research on prediction of final performance has been the physical ability of the horse, despite the fact that riders and horse owners systematically relate performances to the temperament of their horse (Visser 2002). In the last couple of years, however, there has been more research focusing on temperament traits in horses (Momozawa et al 2003; Søndergaard & Halekoh 2003; Visser et al 2001, 2002; Rietmann et al 2004; McGee & Smith 2004).

### *1.8 BLUP-index*

BLUP (Best Linear Unbiased Prediction) is a breeding value estimation method. The index facilitates calculation of the breeding index with greatest certainty. It is

used for stallions and other breeding animals and in other species such as cattle. The Swedish BLUP-index for stallions 2003, in The Swedish Warm blood Association, involves 253 stallions with a minimum of 15 judged offspring each. The index is built upon the results of the offspring in a competition for four-year-old horses, called "Kvalitetsbedömning". These competitions include judgement of exterior, gaits and show jumping ability, and therefore give an all round picture of the hereditability of the stallions. Data have been collected since 1973 and more than 16 000 horses have participated since then (Philipsson 2003).

The total index is divided into different indexes for exterior (type, the accuracy of the extremities, and the gaits shown by hand), gaits when ridden (walk, trot, canter, temperament and general impression), and lastly the show jumping (technique, temperament and general impression). The jumping has been free jumping for some and jumping when ridden for others, depending on what year the horse competed. There is also an index for height.

All the indexes except the one for height, are shown as relative numbers with 100 as the base number. The best stallions have an index around 150 in exterior and 170-180 in show jumping and dressage. The lowest values are around 30-40. With the background that the base value 100 is an average breeding value for the stallions born during the 70s, the stallions born in the 90s have an average on approximately 110.

### *1.9 Breeding*

During domestication of the horse, breeding has been decided by man. This means that it was no longer the survival of the fittest, but survival of the individual that suited us the best. Humans decided what traits were the most important and chose those through selective breeding. Earlier, the choice of stallion was made from which ones lived nearby, so bloodlines were limited to those in close proximity, because of the difficulties with transportation and long distances. When industrialisation came and, with that, the possibility to transport horses over longer distances, more selective breeding developed.

15 years ago artificial insemination (AI) was introduced to the Swedish horse breeders and that meant that the quantity of the stallions increased markedly as the international market opened (Thorén 2003).

In 1990, 78% of the matings in the Swedish Warm Blood breeding were made by stallions born in Sweden, 21,5% by imported stallions and 0,5% with imported sperm. In 2002, 65% imported stallions were used, 8% imported sperm and only 27 % Swedish stallions.

This means that the breeders in Sweden need access to the equivalent of the Swedish BLUP-index for stallions in other countries. Unfortunately though there are major differences in other countries breeding values and that makes it impossible to compare stallions from different countries directly. An international project called "Interstallion" is now working to find a method to facilitate the comparison between stallions with different breeding values from various countries (Thorén 2003).

The breeding goal for the Swedish Warm Blood Association is the following: " To produce a noble, correct and durable horse which through its performance directed temperament, its ride-ability, its excellent gaits and/or show jumping skills, is competitive internationally".
(freely translated from www.asvh.se/asvh/avelsml596.asp)

### *1.10 Dressage versus show jumping*

It is common held opinion among "horse people" that dressage horses are easier spooked and shy more often at things than do show jumping horses, however, to my knowledge, no scientific research has been made earlier to test this assumption. It is also important to have the right horse-rider combination in different situations, to avoid accidents. Many horses that are bred to become Grand Prix horses never succeed all the way up but end up with a beginner rider on the road with traffic and other stimuli, which may result in accidents due to the wrong horse-rider combination in a certain situation. Thus a horse that might work well in a competition arena with a professional rider may be considered easily spooked and skittish when combined with a less experienced rider in a completely different environment.

During the last couple of years, research in horses' fear reactions has increased, and making it more likely that we will be able to establish a mentality test to see what the horse is best suited for; a life in competitions with a professional rider or leisure riding?

This experiment will investigate whether training - young unbroken versus competition horses, and/or genes - dressage versus show jumping lines, affect how horses respond to a fear stimulus. In connection with this project we gave the horse owner/riders involved a questionnaire (see appendix), to gain more information on their relationship to the horse. This questionnaire has however, not yet been analysed due to time constraints.

## 2. Material and methods

### *2.1 The horses*

Thirty-two riding horses were included in this study, 15 in the dressage group and 17 in the show jumping group (see table 1 and 2).

In the show jumping group the horses were all of Warm Blood type, mostly Swedish but some also with German bloodlines. There were 8 mares and 9 geldings. The youngest ones were 3 years old and the oldest were 8 years old. Their education levels were from just broken to competing in the highest level nationally.

The dressage group included 4 mares, 10 geldings and one stallion. They were all of Warm Blood type, Swedish or German, except for the stallion that was a lusitano. The youngest horses were 1 year old, and the oldest 9 years old. Their education levels were from minimal handling to training Grand Prix movements.

To be allowed to be part of the study the horse must have a sire that either has a BLUP-index over 110 in the selected discipline and at least 15 lower in the other discipline, or who competes or has competed at the highest level in the actual discipline. The horse itself should be trained exclusively in their discipline (the dressage horse in dressage and jumpers only in jumping) and, if old enough, being actively trained for competition. The young ones that had not started their riding education yet, were grouped into their discipline according to their sires.

There were 28 different sires. One had 3 offspring and two had 2 each. 80% (12 of 15) of the stallions with a BLUP-index had 130 or more in their specific discipline, 53% had over 150. The average BLUP-index for the dressage- and show jumping sires were 146 and 154 respectively.

The stallions that did not have a Swedish BLUP-index were either too young or were not Swedish. These stallions, however, were competing in the highest level in their specific discipline or, if they were young, were very talented in one specific discipline and are being trained for Grand Prix and have sires themselves that have high BLUP-index in either dressage or show jumping.

The horses came from four different stables in Sweden, and we scheduled one day for the experiment at each stable, two days in June, one in the end of July and the last day in the middle of November. The temperature differed between 23 degrees Celsius the day in July to 0 degrees Celsius the day in November. The stables were; *stable 1,* private with about 10 horses, different riders to the horses, mixed jumping and dressage; *stable 2*, private with approximately 30 horses, different owners/riders to most of the horses, only dressage; *stable 3,* private*,* approximately 30 horses, one rider responsible for most of the horses, different owners, only jumping and *stable 4,* riding school for higher education, about 240 horses, different riders, mixed jumping and dressage.

### *2.2 Experimental set-up and testing procedures*

The experiment was performed in indoor riding-arenas familiar to each horse; the smallest was approximately 15x30m and the largest 20x60m. The horses were either taken directly from the stable or from the pasture. Each horse was led with a halter into the arena to a bucket always filled with at least 1 kilo of oats. There were no other horses in the arena. The handler continued walking another 3-4 metres and then stood passively facing the horse, still holding it loosely in a lunge line. The stimulus in this study was a large, black plastic garbage bag. It was placed along the wall on the ground, about 8 metres from the bucket with oats. In this way the horse had the stimulus obliquely from behind, on its left side. (See sketch in appendix). The video camera was set up just beside the plastic bag, and all the sessions for each horse were filmed.

The observer stood 8 metres from the plastic bag along the wall, directing the movement of the plastic bag with bale strings.

When the horse had been eating for at least 20 s, and when it had its head down in the bucket, the observer pulled the string so that the plastic bag moved towards

the observer about one metre. The horse reacted and the handler just followed and let the horse react as much as it wanted. When the horse went back to the bucket and took a bite of the oats, that trial was finished. If the horse had not gone back and eaten in one minute the trial was ended.

The horse was then led just out of the arena, so it could see other horses, then it was led in again and the next trial started. The experiment was carried out five times with every horse to investigate any eventual habituation. It was about one and three minutes between the trials for each horse.

In between each trial the observer restored the experimental set-up and kept notes on the horse's reaction, the time it took for the horse to go back and eat, alternatively if it did not go back, and if any specific events happened during the session, such as a tractor driving past outside (see appendix for observation sheet). It was the same handler and observer during the four days.

The horse's reaction was rated from 1 to 5. The definitions for each number are the following:

**1 -** *No reaction* - does not stop chewing, may turn its ears towards the stimulus

**2 -** *Head up* - throws head up, stops eating/chewing but does not move away

**3 -** *Alert* - quivers and may step up to two steps away

**4 -** *Sidesteps* - steps more than 2 steps away but not as energetic as "flight"

**5 -** *Flight* - jumps and runs away

*Table 1. The dressage horses included in the study. The abbreviations in the column "sex" are the following; G: gelding, M: mare S: stallion*

| Horse no | Age | Sex | Stable |
|---|---|---|---|
| 1 | 3 | G | 1 |
| 2 | 3 | G | 2 |
| 3 | 4 | G | 2 |
| 4 | 9 | G | 2 |
| 5 | 7 | M | 2 |
| 6 | 8 | S | 2 |
| 7 | 8 | G | 2 |
| 8 | 1 | M | 2 |
| 9 | 9 | M | 2 |
| 10 | 1 | M | 2 |
| 11 | 4 | G | 4 |
| 12 | 4 | G | 4 |
| 13 | 3 | G | 4 |
| 14 | 3 | G | 4 |
| 15 | 3 | G | 4 |

*Table 2. The show jumping horses included in the study. The abbreviations in the column "sex" are the following; G: gelding, M: mare, S: stallion*

| Horse no | Age | Sex | Stable |
|---|---|---|---|
| 16 | 3 | G | 4 |
| 17 | 3 | G | 4 |
| 18 | 4 | G | 4 |
| 19 | 4 | G | 4 |
| 20 | 4 | G | 4 |
| 21 | 3 | G | 4 |
| 22 | 3 | G | 4 |
| 23 | 8 | M | 3 |
| 24 | 5 | M | 3 |
| 25 | 8 | G | 3 |
| 26 | 6 | M | 3 |
| 27 | 4 | M | 3 |
| 28 | 4 | M | 3 |
| 29 | 3 | M | 3 |
| 30 | 7 | M | 3 |
| 31 | 5 | G | 3 |
| 32 | 6 | M | 3 |

# 3. Results

## *3.1 Dressage versus show jumping*

### *3.1.1 All ages*

Significant differences were shown in reaction vigour between dressage horses and show jumping horses of all ages, except in the fifth trial (see figure 1 and table 3). The T-test used was a Student's T-test with a two-tailed distribution.

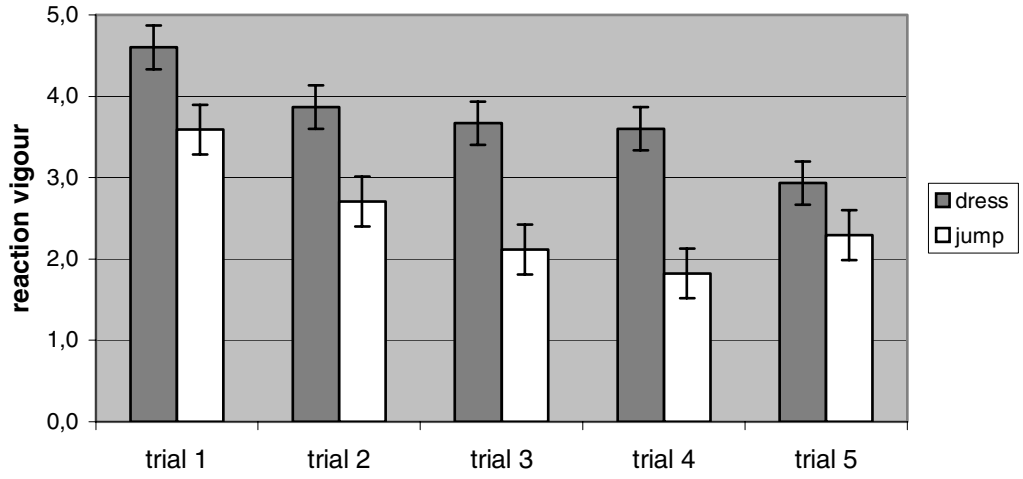


*Figure 1. Average reaction vigour (± s.e) - dressage versus show jumping – all ages.*

*Table 3. P-values for the T-tests comparing dressage and jumping line horses in figure 1*

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Trial 5 |
|---|---|---|---|---|---|
| **T-test** | 0,004 | 0,002 | 0,0008 | 0,00006 | 0,19 |

### *3.1.2 The untrained groups*

The untrained group, age 1-3, were also compared in the two disciplines. The T-test was used, see the above definition. There were significant differences here as well, in all trials except in trial 5. (see figure 2 and table 4).

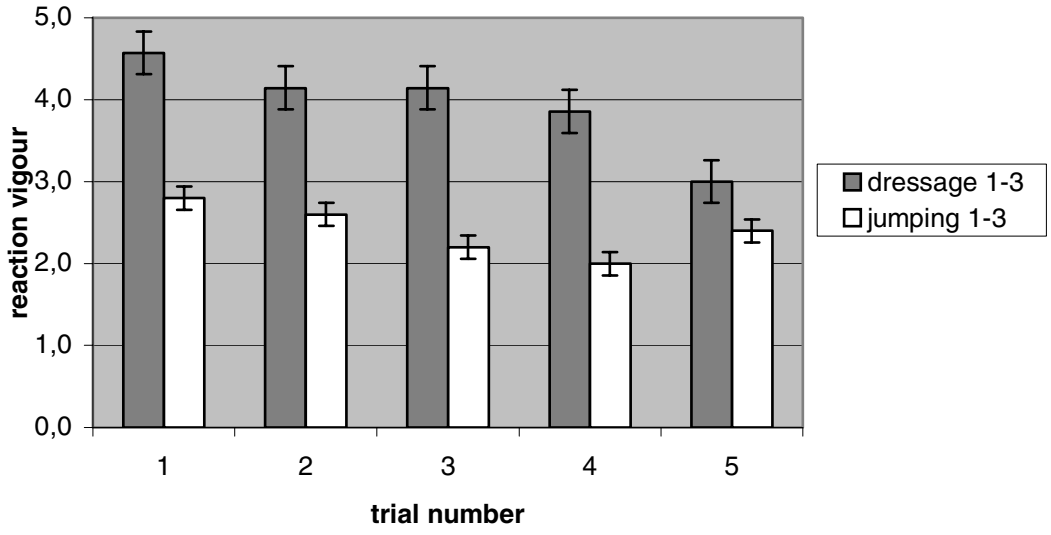


*Figure 2. Reaction vigour (± s.e), dressage versus jumping – untrained (age 0-3).*

*Table 4. P-values for the T-tests comparing untrained horses in figure 2 (age 1-3), dressage versus jumping*

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Trial 5 |
|---|---|---|---|---|---|
| **T-test** | 0,05 | 0,05 | 0,008 | 0,05 | 0,52 |

### *3.1.3 The trained groups*

The trained group, age 4-9, were also compared in the two disciplines. The T-test used, see the definition under "all ages". There were significant differences here as well, in trial 2, 3 and 4. (see figure 3 and table 5).

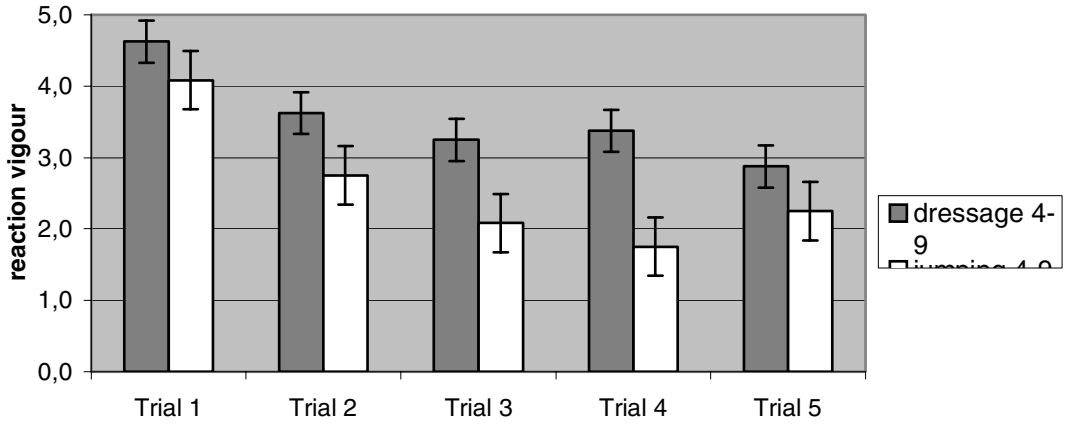


*Figure 3. Reaction vigour (± s.e), dressage versus jumping – trained (age 4-9).*

*Table5. P-values for the T-tests on the data in figure 3 (age 4-9), dressage versus jumping*

| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Trial 5 |
|---|---|---|---|---|---|
| **T-test** | 0,08 | 0,04 | 0,05 | 0,006 | 0,31 |

## *3.2 Comparison in the different disciplines*

When analysing data within each discipline there were only minor differences between the age groups, none were significant (see figure 4 and 5).

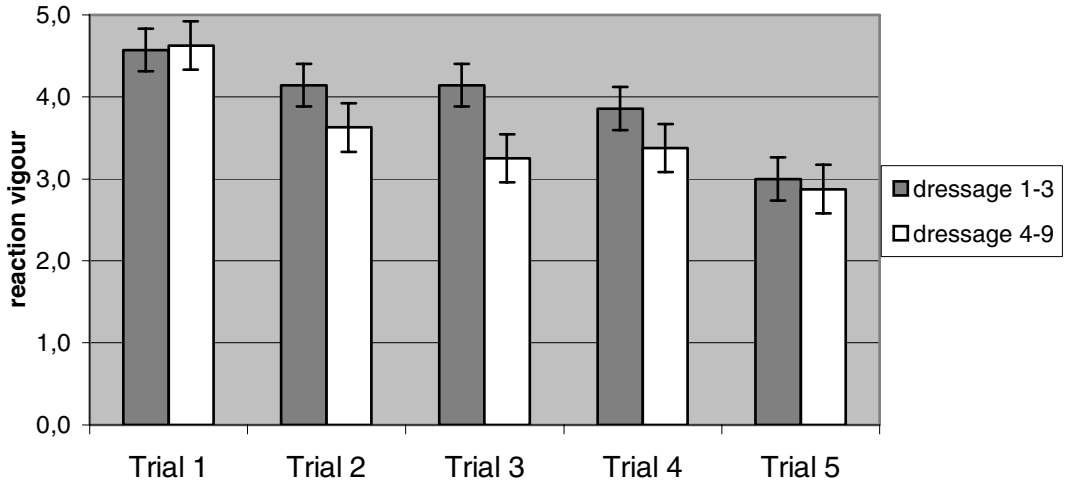


*Figure 4.Reaction vigour (± s.e), untrained (age 1-3) versus trained (age 4-9) – dressage.*

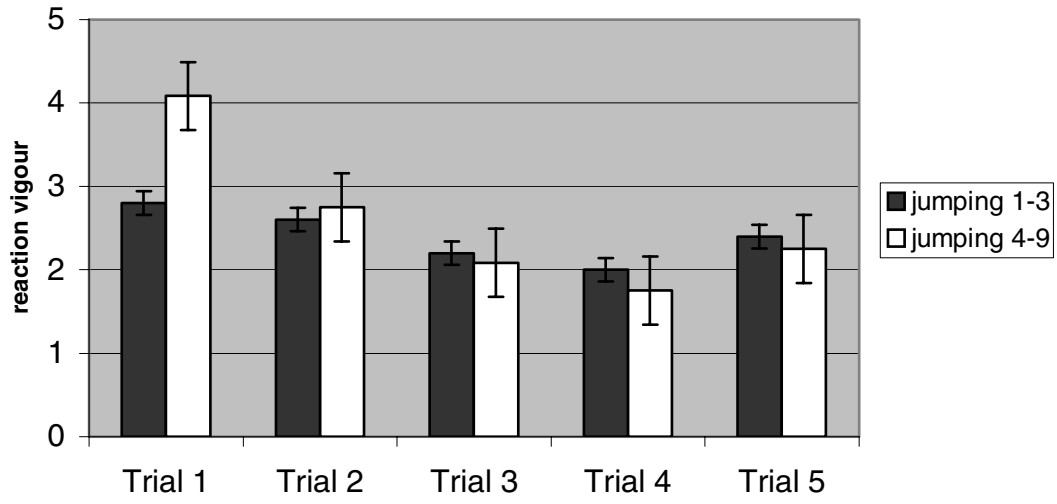


*Figure 5. Reaction vigour (± s.e), untrained (age 1-3) versus trained (age 4-9) – jumping.*

### *3.2.1 Different age groups*

In the previous figures, the horses were divided into two groups, trained and untrained. The untrained group consisted of the horses in the age 1-3. Untrained in this context does not mean totally unhandled, but maximally just broken and different four year old horses may be at different stages in their training and so in one case should be classed as untrained and other better fitted to the class of trained horses. To investigate how this might be affecting the results, in tables 6 and 7 the differences in reaction rate in the different age groups (1-3, 4 and 5-9)

are presented. This division into 3 rather than 2 groups means that there are too few horses in each group to be analysed statistically.

*Table 6. The average reaction vigour for different age groups, in jumping and dressage. The numbers in brackets are the no of horses included in each group. Trial 1*

| Trial 1 | Age 1-3 | Age 4 | Age 5-9 |
|---|---|---|---|
| Dress average | 4,6(7) | 4,7(3) | 4,6(5) |
| Jump average | 2,8(5) | 3,6(5) | 4,1(7) |

*Table 7. The average reaction vigour for different age groups, in jumping and dressage. The numbers in brackets are the no of horses included in each group. Trial 3*

| Trial 3 | Age 1-3 | Age 4 | Age 5-9 |
|---|---|---|---|
| Dress average | 4,1(7) | 2,3(3) | 3,8(5) |
| Jump average | 2,2(5) | 1,8(5) | 2,4(7) |

### *3.3 The stables*

There were horses from four different stables (see table 1 and 2). In the initial plan it was thought that we were going to use more than one horse from stable 1, but this was not possible. Nevertheless, compared to the other horses from the other stables, in the same age group and the same discipline, the horse from stable 1 had similar results.

*Table8. The average reaction vigour for each stable in three trials, stable 1 not included as only one horse.*

| | **Trial 1** | **Trial 3** | **Trial 5** |
|---|---|---|---|
| **Stable 2 dress** | 4,6 | 3,8 | 3,3 |
| **Stable 4 dress** | 4,6 | 3,4 | 2,2 |
| **Stable 4 jump** | 3,1 | 2,0 | 1,9 |
| **Stable 3 jump** | 3,9 | 2,3 | 2,6 |

## 4. Discussion

This study supports the view that dressage horses react more than the show jumping horses. It also suggests that this effect is irrespective of age and training status. Although there were some differences between the age groups within each discipline, the differences were not significant. There were also differences between the stables where the horses were kept, but these were not significant either and they were less than the differences between the categories of horses. Possible reasons for the difference between dressage and show jumping horses in fearfulness are discussed.

Significant differences were shown in reaction vigour between dressage horses and show jumping horses of all ages, except in the fifth trial (see figure 1 and table 3). The dressage horses reacted more in all trials. The untrained groups, age

1-3, were also compared in the two disciplines. There were significant differences here as well, in all the trials except in trial 5 (see figure 2 and table 4). In the trained groups, age 4-9, there were also significant differences, in trial 2, 3 and 4. (See figure 3 and table 5).

When analysing data in discipline separately, there were only minor differences between the trained versus untrained groups of horses, except in trial one in jumping horses where the older horses reacted more. There were however no significant differences (se figure 4 and 5). From the figures it can be seen that there was an increase in reaction vigour in trial five in the show jumping group in both the trained and untrained groups. There were no special events that occurred during the trials that can explain the increase and there were too small a number of horses to be able to draw any conclusions from it.

The dressage horses reacted rather strongly irrespective of age in trial 1 (see table 6 and 7) whereas among jumping horses it was the older horses that reacted the most. One possible explanation for this may be that older, trained horses get a higher ratio of high-energy food than the younger horses. But if this was the case one would have expected to see the same difference in dressage horses, that is to say that older, trained dressage horses reacted more because they would also be getting a higher energy ration than younger dressage horses, and this was not the case.

In trial 3 (see table 6 and 7) the youngest dressage horses still reacted strongly while the other groups in both disciplines have decreasing reactions. That the younger dressage horses react more might be because they have not yet been exposed to as many stimuli as the competition horses have.

There is always a risk for bias or confounding when using horses from different stables. It could be the different training, different handling or different environment that complicates the interpretation of the results. Table 8 illustrates the average reaction vigour for each stable except stable 1, in three trials. However, stables were chosen that had as many categories of horses as possible, e.g. young and old horses within a discipline, or competition horses in both disciplines to minimise any confounding effects. Even if there were differences between the stables in this study, none were significant.

In this study only horses with a BLUP-index of over 110 in the selected discipline and at least 15 lower in the other discipline were chosen. The ideal would have been to have an even more distinct difference e.g. only use horses whose sires had over 150 in BLUP-index for one discipline and below 100 in the other. Unfortunately though, this would be difficult to accomplish as most good breeding stallions usually have indexes over 110 in both gaits and show jumping. With more time and a larger population one might have succeeded in having a greater difference in the BLUP-indexes for the two different traits for each stallion, which would have allowed better arguments that the stallions were exclusively dressage or show jumping breeders. It could also have been improved if the BLUP-index for the grandfathers on both sides were determined. Nevertheless, such stricter control in the selection of horses would presumably

have led to an even more significant difference between the horses of the different disciplines and not changed the interpretation of the results from this study.

### *4.1 Why the difference?*

A question that arises from this study is why dressage horses react more than the show jumping horses. Is it our expectations of a future dressage horse that makes a difference in how the horse behaves? Do we behave differently towards them? Is it more allowed for a dressage horse to shy for the garbage bin and not dare walk past a flapping plastic sheet than it is for a jumping horse? Are "dressage people" different from "jumping people"? Are jumping people more bold?

There does not seem to be any need to have more reactive horse in dressage than in jumping. A jumping horse also needs to be quick in its reactions if it is to be successful. Dressage horses as well as jumping horses need to be sensitive, quick and alert to the rider's aids and focus on the rider only and not be too easily disturbed by the environment. But a reactive and sensitive horse is not the same as a skittish horse. A horse can have a short reaction time and be sensitive to the rider's aids without being generally fearful. Focusing on the rider is probably a training trait and a good rider can manage a horse that might otherwise be fearful and unfocused, by giving it a meaningful training leading to a horse that concentrates and trusts its rider.

In this study it is difficult to say how much the training influences the result as all the horses were trained to a certain extent, even if they were not ridden. However, it is possible to conclude from this experiment, that the *amount* of training does not seem to change the horse's reaction vigour, as there were no significant differences between the trained versus untrained group. The training is however different in the two disciplines. A jumping horse is exposed to many more stimuli than a dressage horse, for example by being exposed to different types of fences, more noise and people moving around at the competitions. At a dressage competition, the aim is to eliminate as many disturbing stimuli as possible for example by playing calming music in the background, asking the audience to be quiet and not applaud until the ride is finished. Thus it is likely that the different training in the different disciplines can play a major role on the result. Although training is unlikely to explain why the fearfulness levels of the 1-3 year old dressage and jumping horses were different.

Most likely the similarities in reaction vigour between the trained and untrained group in each discipline and the differences between the horses from the jumping and dressage lines are affected by genetics. As dressage lines are more fearful and reactive than the jumping lines, could it be that we are breeding these traits deliberately or do they arise as a consequence of something else that we are actively selecting e.g. powerful gaits. A tense and excited horse may in some people's mind be pleasant to look at since it shows spectacular gaits and a proud posture. Thus these types of horses could be desirable in dressage. In higher dressage, however, it is not useful if a horse is too excited and has built up too much tension. The horse needs to be relaxed to be able to perform the difficult movements with good quality.

In summary, this study suggests that genetics plays a major role in how strong the horses reacted to the frightening stimulus in this experiment and that we probably get the increased fearfulness, a so-called "fear factor" as a side effect when selecting for powerful, expressive gaits.

### *4.2 The future*

It would be interesting to analyse the questionnaires (see appendix) answered by the riders/owners in this experiment, to see if the handlers' opinions of their horses' reactivity and "spookiness", correspond to our results. In the long run our test may be useful in a future mentality tests to test the individual horse's suitability for the rider's interest or goal.

It would be good to continue this work comparing dressage and show jumping horses in a larger experiment, with the improvements discussed above, to investigate in more detail the effects of training versus genetic on fearfulness in horses.

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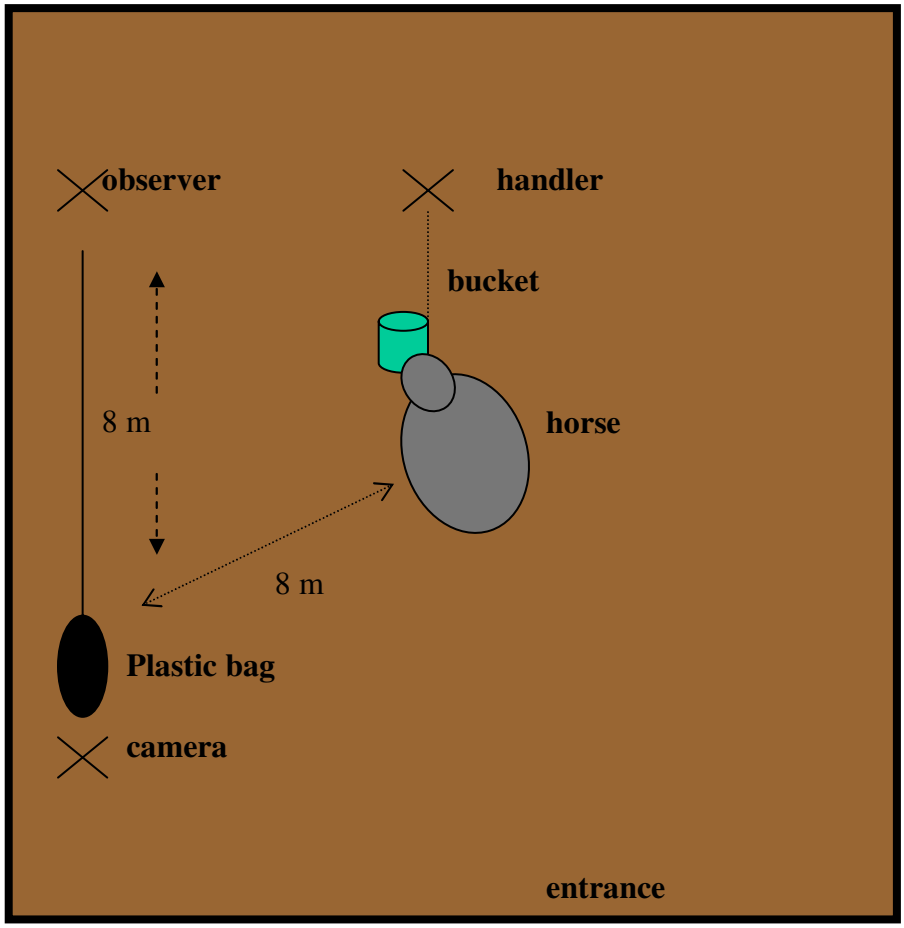
Lastly I would like to thank my family for all the support and encouragement during my time as a Veterinary Student.

# Appendix

## *A. Sketch over arena*



### *B. Observation sheet*

**Number:** **Observer:** **Uta**

| **Trial** | | **Reaction** | | | | **Time to get back** | **Didn't go back** | **Event** |
|---|---|---|---|---|---|---|---|---|
| 1 | flight | sidesteps | alert | head up | none | | | |
| 2 | flight | sidesteps | alert | head up | none | | | |
| 3 | flight | sidesteps | alert | head up | none | | | |
| 4 | flight | sidesteps | alert | head up | none | | | |
| 5 | flight | sidesteps | alert | head up | none | | | |

***Flight:*** *jumps and runs away;* ***Sidesteps:*** *steps >2 steps away but not as energetic as "flight";* ***Alert:*** *quivers and may step up to two steps away;* ***Head up:*** *throws head up, stops eating/chewing but does not move away;* ***None:*** *Does not stop chewing.*

In between each trial the horse's reaction is circled by the observer who also notes the time it took for the horse to go back and eat, alternatively if it did not go back, and if any specific events happened during the session, such as a tractor driving past outside

### *C. Questionnaire*

**Frågeformulär till praktisk studie ”Är dressyrhästen mer lättskrämd än hopphästen” - Examensarbete inom Veterinärutbildningen**

**Detta formulär ska fyllas i utav den som rider hästen i första hand**

**Hästdata:** Hästens namn: Ålder:

Kön: Ras:

Användningsområde: Dressyr Hoppning (ringa in rätt alt.)

Antal år i träning: Utbildningsståndpunkt:

**Härstamning:** Fader: Moder:

Morfader:

**Ägarinfo:** Ägarens namn:

Tel:

**Ryttarinformation:** Namn:

Ålder: Kön:

## Ryttare/häst relation

**Hur länge har du ridit hästen?**

**Hur väl skulle du säga att du känner hästen?**

1 2 3 4 5 6 7 8 9 10

(1-känner den knappt alls, 10- känner den mycket väl - gör en ring runt siffran som överensstämmer bäst)

**Hur är din relation till hästen?** 1 2 3 4 5 6 7 8 9 10

(1 –Har den endast som en tävlingspartner, 10 – hästen är min bästa vän - gör en ring runt siffran som överensstämmer bäst)

## Ridning

**Hur många timmar/vecka rids hästen?**

**Hur känslig är hästen för dina hjälper?** 1 2 3 4 5

(1-mkt känslig, 5-okänslig - gör en ring runt siffran som överensstämmer bäst)

**Hur ”vaken” är din häst**: 1 2 3 4 5

(1-orubblig, 5-mkt ”tittig” - gör en ring runt siffran som överensstämmer bäst)

**Är din häst lättlärd**? 1 2 3 4 5

(1- inte alls, 5-mycket lättlärd - gör en ring runt siffran som överensstämmer bäst)

## Foder

**Hur mkt kraftfoder i kg/dag och vilken sort:**

**Hur mkt grovfoder i kg/dag och vilken sort:**

**Hur matglad är din häst?** 1 2 3 4 5

(1- inte alls, 5- väldigt mkt - gör en ring runt siffran som överensstämmer bäst)

**Hur mycket gillar hästen havre**? 1 2 3 4 5

(1-mkt lite, 5- väldigt mkt - gör en ring runt siffran som överensstämmer bäst)

## Utevistelse

**Antal timmar/vecka**:

**Går den ensam eller med andra hästar?**

**Vilken typ av hage:** gräshage grushage annan ex skrittmaskin, promenad etc:

**Övrigt:** Tex; Har din häst några specifika egenskaper/karaktärsdrag som utmärker den från andra hästar?

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Tusen tack för din hjälp att främja forskningen inom hästens beteende!