Behaviour of Horses in the “Round Pen Technique”

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Abstract:

I investigated the behavioural background of the way horses learn to follow humans in the “round pen technique” suggested by "horse whisperers” as a gentle method for initial horse training. Though the practicability of this technique has been adequately demonstrated in the past, the horses‘ behaviour during such training has not yet been documented in detail. DIn a riding arena, horses, that did not follow the trainer immediately, were chased away so that they galloped around the trainer. Galloping horses showed specific behaviour such as turning the ear to the trainer, chewing, licking, and stretching head and throat downwards. In subsequent trials horses needed to be chased for less time and finally followed immediately, even when conditions were changed or the trainer was replaced by another person. This suggests that horses learn to follow in this particular situation and also show some generalisation. However, following did not occur on a pasture even after several successful trials in the riding arena.

Key words:

learning, dominance relationship, horse, human-animal relationships

1. Introduction:

“Horse-whisperers”, such as John Lyons, Ray Hunt, Monty Roberts, Pat Parelli, and others (Miller & Lamb 2005), have suggested for a long time that their “round pen technique.” is a useful, gentle method for initial training or treating horses that decreases fearful responses of horses towards humans. It provides an opportunity for trainers to minimize fearful reactions of young horses to novel situations (Rivera et al., 2002) or those or mature, well trained horses in specific situations, like loading horses on trailers or applying medical treatment to them.

The basis of round pen work is to understand the horses` behaviour (Rivera et al., 2002, Sighieri et al., 2003). A horse, that does not cooperate with the trainer on the ground, will be chased away until it starts to respond to the person with certain signals. Thereafter, the horse is allowed to return to the human, groomed and invited to follow (Roberts, 2002). Roberts (2002) encourages beginners as well as advanced riders to initiate interactions with their horses in such a way. Mounting the horse is considered to be much easier, safer, and gentler for the horse after successful ground work than after traditional breaking-in methods (Miller & Lamb, 2005).
The behaviour of horses during such interactions might offer opportunities for controlled scientific studies on various aspects of equine behaviour, which otherwise are difficult to investigate, such as learning and cognition and the role of environment and conspecifics. It could also help to clarify the disagreements about a clear concept of dominance and the group structure of horses reflected in the present literature (Ellard & Crowell-Davis, 1989; Houpt et al., 1979; Keiper & Sambraus 1986; Clutton-Brock et al., 1976).

The behaviour of horses in interactions in the “round pen” has as yet rarely been described and analysed in a rigid, scientifically controlled way. I therefore investigated if the gestures and the facial expression of horses shown during interactions in the “round pen technique” can be standardized and if the interaction can be broken down into recognizable units. Furthermore, I evaluated whether the horses’ following behaviour varied with age, sex, and surrounding during repeated interaction and after exchanging the experimenter, as well as whether the trainer needs to show certain cues or signals to persuade a horse to follow.

2. Material and Method:

1. “Round pen technique”

1. Horses

I investigated 26 domestic horses kept in different kinds of housing, either in stables, but during the day time on pastures in social groups, or in open stall barns in social groups. The horses studied were randomly divided into two groups, because it was impossible to test them all on the same day. Group 1 consisted of 2 geldings and 11 mares, group 2 of 8 geldings and 5 mares, all aged between 4 and 22 years. All horses are riding horses familiar with humans. Horses were identified by their brands, individual colour, and white markings on their heads and legs.

2. Trainers

Experiments were conducted blindly, i.e., the trainers neither knew the dominance status of the horses investigated nor the predicted outcome of the trials, as test horses were chosen by another person.

3. Experimental procedure

The horses` behaviour was recorded by continuous video taping. They were observed on three days (calendar days 1, 2 and 8) in a familiar riding arena, working in a 20 m x 20 m square, which was separated from the rest of the arena by a barrier. The interaction consisted of the following five phases.

Phase 1: The horse is led into the riding arena, the rope is removed from its halter and it is allowed to investigate the familiar surroundings. It does not follow the trainer spontaneously.

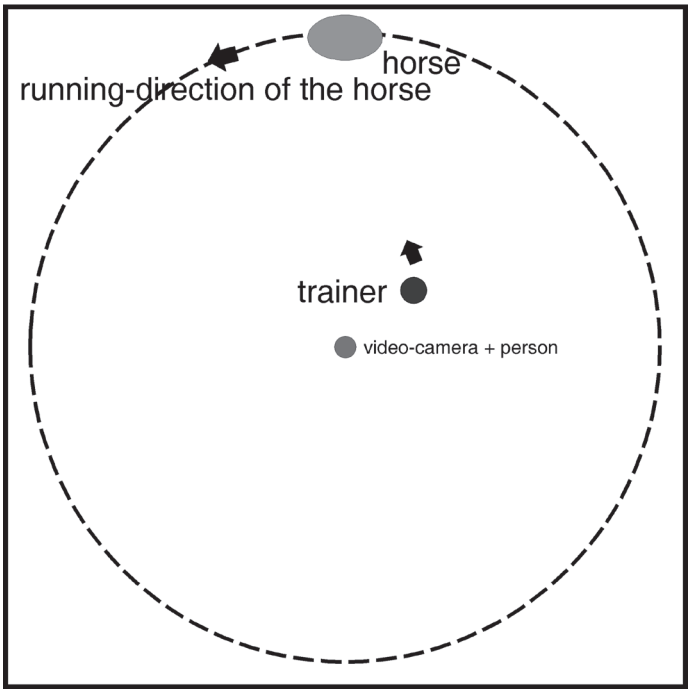

Fig. 1
“round pen technique” in the riding barn: Step 2

Phase 2: The trainer chases the horse away. The horse gallops in circles around the trainer and turns its inner ear towards him/her.

Phase 3: The horse reduces the diameter of the circle in which it gallops around the trainer.

Phase 4: While galloping the horse begins to lick and chew and stretches its head and throat downwards. Licking and chewing bouts as well as stretching head and throat were studied in detail in the galloping horse. These bouts were counted separately from the licking and chewing that took place while the horse followed the trainer. Continuous licking and chewing was counted as one bout, but if this action was interrupted for several seconds it was counted as two bouts. Stretching head and throat downwards was counted when the mouth of the horse was lowered to the level of the point of shoulder or below.

Phase 5: The trainer turns his/her back to the horse. The horse slows down, stops, turns to the trainer, licks and chews and approaches him/her or if not, is approached by the trainer. The trainer offers the horse the option to follow him/her. The horse licks and chews, and follows the trainer in any direction. When it hesitates, it will be gently pushed in the flanks, so that it has to draw alongside the trainer.

Horses were considered as following when they stayed within 1 to 2 metres from the trainer’s shoulders and walked with him/her immediately after chasing in any direction for at least 10 minutes. The time in seconds from taking off the rope from the horse’s halter, when they were led into the riding arena, until the horse stood within 1 to 2 metres of the trainer’s shoulders and started following is referred to as time till following, ttf.

4. Generalisability of the interaction with the trainer

The experimental procedure of the “round pen technique” was repeated again with ten randomly chosen horses (3 geldings and 7 mares), but from trial 4 on with other trainers (trial 4 to 6 on calendar days 72, 78 and 79) and with the original trainer under slightly changed conditions: in trial seven (calendar day 85) without any acoustic signals, since trainers unconsciously included acoustic signals in the previous trials, and in trial 8 (calendar day 86) also without acoustic signals, but in contrast to the other trials without holding a rope. As some "horse whisperers" claim that a horse, which does not follow properly, has to be gently pushed in the flanks, we offered the horse the option to follow without pushing and also without grooming in trial 9 (calendar day 92). Finally, in trial ten (calendar day 96), the first trainer disguised herself with a sheet over head and body throughout the whole procedure.

After following the trainer in the riding arena in trials 7 to 9 of the previous test series, the horses were

individually led into a large pasture (8 ha) with plenty of grass and grazing horses from the same social group. I investigated how long the horses would stay with the trainer after being released.

2. Passive association of horses in the pasture
To determine whether it is part of horses` behaviour to follow any person who passively associates with them for a certain time in their natural environment, or even grooms them, I investigated the behaviour of 16 horses kept in social groups on a large pasture (8ha), and the behaviour of 4 individually kept horses and of 7 horses kept with a partner in small paddocks (size 1867m² to 1750m²).

1. Experimental procedure
The experimenter stayed passively with an individual horse for 30 minutes on three days (calendar days 1, 2 and 8) and thereafter offered it the option to follow her within approximately five seconds. Over a second trial on each test day, the experimenter groomed the horses before offering them the choice of following.

3. Measurement and Statistical Analysis
Statistical analyses were conducted using the computer program R. Using a Gaussian Generalized Linear Model, tests were conducted to ascertain whether the frequencies of licking, chewing, and stretching head and throat downwards vary between groups of horses, sexes, and age, and among trials 1 to 3, as well as associations between ttf and the frequencies of licking, chewing, and stretching. The data was not normal distributed, but since the distribution of the residuals was best in un-transformed data parametric analysis could be applied.
The significance of the decrease of ttf during the first three trials was estimated by Friedman Anova. The ttf of days 1 and 3 with a first trainer were compared in Wilcoxon Signed Rank Tests with the ttf of the same horses with other trainers and with the original trainer under slightly changed conditions in subsequent trials.

3. Results:

1. “Round pen technique”
In the “round pen” training, horses either went through all 5 phases (trial 1: n = 19; trial 2: n = 23; trial 3: n = 11) or immediately followed the trainer (trial 1: n = 4; trial 2: n = 3; trial 3: n = 15). Three horses did not follow after 30 minutes in the first trial. Those horses showed untypical, immense sweating and did not response to the experimenter any more. Therefor the test was stopped for animal welfare reasons.. However, the three horses followed during the next trials. All horses that went through steps 1 to 5 turned their inner ears to the trainer and reduced the diameter of the circle in which they galloped around her.

The ttf neither differed significantly between groups 1 and 2 (df = 1, t = 0.854, p = 0.396), nor age (df = 1, t = -0.426, p = 0.595) nor sexes (df = 1, t =-0.534, p = 0.595). However, it decreased significantly from trials 1 to 3 (df =2, X^2 = 2.897, p < 0.001). The frequencies of licking (df = 1, t = -1.638, p = 0.106), chewing (df = 1, t = 1.273, p = 0.207), and stretching (df = 1, t = 2.043, p = 0.045) did not differ between groups.

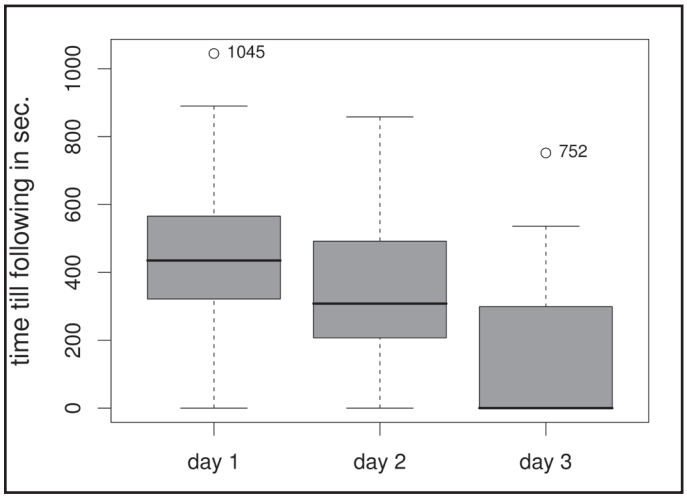

Fig.2
Development of time till following

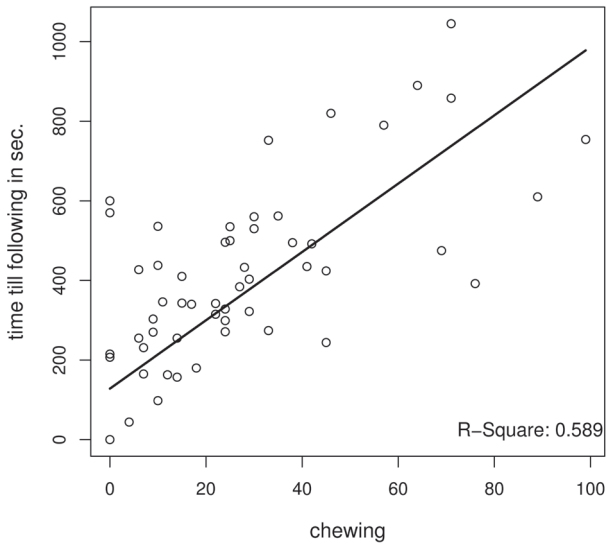

Fig.3
Relationship between the time till following and the chewing units

The ttf was associated with chewing (df = 1, t = 6.115, p < 0,001) as well as stretching (df = 1, t = 4.090, p < 0.001) but not licking (df = 1, t = 1.446, p = 0.152).

After chasing, the trainer offered the horse the opportunity to follow. Several horses immediately approached the trainer, up to a distance of 1 or 2 m, while others waited at a larger distance until the trainer approached them (group 1, day1: 46 %; day2: 69%; day3: 31%; group 2, day1: 61%; day2: 46%; day3: 38 %) before all horses followed her in any direction. While turning to the trainer 74 % of the horses licked and chewed.

1. Generalisability of the interaction with the trainer
In a randomly drawn sub-sample of ten horses, ttf decreased significantly from trials 1 to 3 (df =2, X^2 = 12.378, p = 0.002). When these horses were investigated with another trainer, ttf was shorter than in trial 1 with the first trainer (Z = 2.380, p = 0.021) but slightly, though not significantly longer than in trial 3 with the first trainer (Z = 1.826, p = 0.1).
The ttf values in trials 5 (Z = -1.886, p = 0.064) and 6 (Z = -2.521, p = 0.014) with new trainers, without acoustic signals (trial 7, Z = -2.073, p = 0.044), without acoustic signals and without rope (trial 8, Z = -2.521, p = 0.014), without gentle pushing and without grooming (trial 9, Z = -2.521, p = 0.014) and when the trainer was disguised by a sheet (trial 10, Z = -2.521, p = 0.014) were all significantly shorter than in trial 1. The ttf decreased during the whole test series and finally reached zero for all horses on day 9 and day 10. In contrast, horses following in the riding arena in trials 7, 8, and 9 did not follow when investigated on a large pasture. After trial 7, eight of the 10 horses walked away immediately, while two stayed with the trainer for 15 or 20 sec. respectively (after trial 8: 4 walked away, 6 stayed 10 to 120 sec., mean 40 sec.; after trial 9:, 5 walked away, 5 stayed with the trainer for 5 to 180 sec., mean 48 sec.).

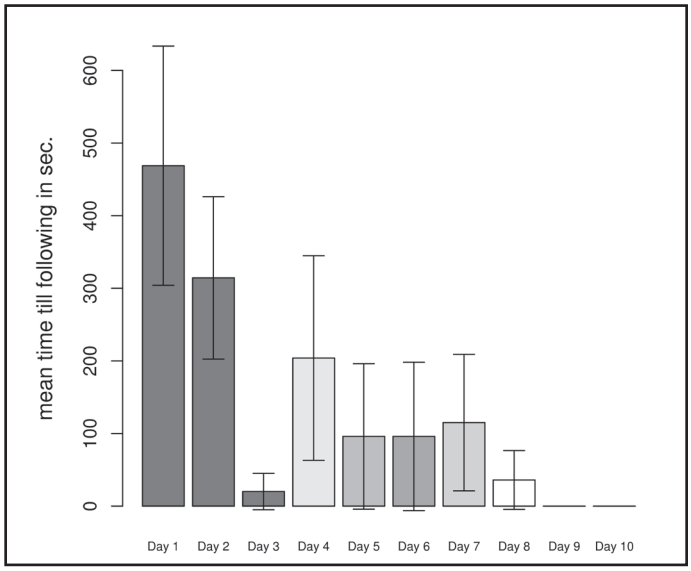

Fig. 4

day 1, 2, 3	trials: first trainer
day 4	trial: second trainer
day 5	trial: third trainer
day 6	trial: fourth trainer
day 7	trial: first trainer, no acoustic signals
day 8	trial: first trainer, no rope in hands
day 9	trial: first trainer, no pushing
day 10	trial: first trainer, covered with sheet

2. Passive association of horses in the pasture
Almost all horses that had been passively approached in the pasture refused to follow, no matter whether they were naive or had followed in the riding arena trials before. None of the horses kept in social groups on a large pasture followed when being offered to do so after 30 minutes, and only one horse followed the trainer for 10 seconds after being groomed. Similarly, only two of the horses that were kept individually or in pairs on paddocks followed the person for 8 or 15 seconds respectively), and none followed after being groomed.

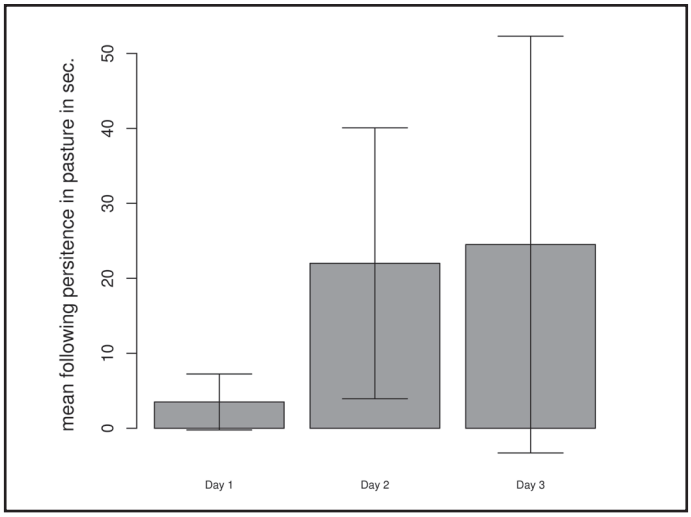

Fig. 5
Increase of marginal time following the trainer on pasture

4. Discussion:

This study indicates that horses trained in the ”round pen technique” show a specific pattern of behaviour that can be divided into several clearly defined units, with galloping in narrowing circles around the trainer, turning the ear towards the trainer, chewing, licking, and stretching head and throat downwards. Furthermore, the time till horses follow the trainer decreases when the experiment is repeated, and horses appear to generalize from the first trials to interactions with other trainers and slightly changed conditions. However, horses neither show following behaviour in a large pasture nor on small paddocks, regardless of whether they are kept in social groups, in pairs or individually.

Licking, chewing, and stretching are of particular interest. Chewing and stretching, but not licking, are correlated with time till following, however, this might be explained by the difficulty of reliably observing licking while galloping. Submissive behaviour in mature horses has been referred to as avoidance or retreat (e. g. McDonnell, 2003; McDonnell & Haviland, 1995; Goldschmidt-Rothschild & Tschanz, 1977; Feh, 2002). But licking and chewing have only been documented for the subordinate gesture of the immature horse, referred to as “Unterlegenheitsgebärde” by Zeeb (1959) and as “Snapping” by Tyler (1972) and McDonnell & Haviland (1995). Young horses stretch their heads and throats forwards, tilt their

heads, pull back the corners of their mouths and clap their teeth. It is debatable whether such subordinate behaviour might be the origin of licking and chewing in adult horses in the “round pen technique” and in the field (Wickert, unpublished data). A dominance relationship between the trainer and the horse might be of importance in the “round pen technique” (Sighieri et al., 2003) during the first few encounters, even thought the horse appears to be able to generalize its experience from the first trainer to other persons.

Horses in our trials followed faster on every trial. When the trainer was changed, the time till following increased again over the last trial with the original trainer, but not as much as expected for the establishment of a new dominance relationship. In contrast, the time till following (ttf) finally tended to zero, regardless of the trainer or the slightly changed conditions.

During the “round pen technique”, the trainer consistently chases the horses, and this chasing seems to be of central importance for following. Chasing is shown in agonistic encounters among horses in the field and seems to be important for the establishment of dominance relationships in between all group members (Ellard & Crowell-Davis, 1989; McDonnell & Haviland, 1995), as well as, for band management, since stallions chase other horses to keep their harem together or to separate single mares from the harem (McDonnell & Haviland, 1995; Feist & Mc Cullough, 1976; Goldschmidt-Rothschild & Tschanz, 1978; Linklater at all, 1999; Feh, 2002). In the context of the “round pen technique”, horses might simply learn how to avoid being chased. This is supported by the observation that horses that had followed the trainer in the riding arena, usually did not follow on a pasture. Though the time a few horses stayed with the trainer slightly increased over the course of the three trials, following remained extremely rare compared with the long, stable association of horses with humans in the riding arena after “round pen training”. The learned following behaviour was obviously bound to the surroundings of the riding arena.

The slight and insignificant increase of ttf in the trial in which no acoustic signals were used might reflect the fact that our test horses were used to humans who normally shout or talk when handling horses, but this results do not allow any conclusion about the importance of acoustic signals for the “round pen technique”. Nevertheless, it seems to be more surprising that horses did not behave differently when the trainer did not hold a handling-rope in his/her hands, as a handling-rope is often a signal for several trained behaviours. The horses apparently did not connect the learned following behaviour with the presence of a handling-rope. In contrast to the suggestions of “horse whisperers” (Roberts, 2002) the absence of grooming or pushing the horse during the “round pen technique” did not make any difference to them. Though some horses were disturbed by the unusual appearance of the trainer when she was disguised by a sheet, they quickly recognised the trial situation and followed immediately, at the latest after having been groomed by the trainer. Social grooming among horses is of particular importance in the context of group cohesion (Feh, 2002) and "horse whisperers" groom their horses while offering them the chance to follow. In my experiments, grooming appeared to have no significant effect on the following behaviour either in the riding arena or in the field. Nevertheless, as to our experience in the trial with the trainer covered by a sheet, grooming appeared to be reassuring to some more nervous horses.

5. Conclusion:

The aim of standardising the gestures and the facial expression of horses shown during interactions in the “round pen technique” and breaking down the interaction into recognisable units could be realised to a large extent. The results suggested that the following behaviour of horses, shown in the round pen, is learned and connected to the surroundings. Whether a dominance relationship between the trainer and the horse is important could not clearly be evaluated in this study.

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