

EMOTIONAL REACTIONS OF HORSES AND TRAINERS DURING NATURAL METHOD TRAINING*

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Abstract

The first aim of the present study was to evaluate whether the trainer factor and the sex of the horse affect the heart rate (HR) of the trainer-horse pair. The second aim was to estimate the level of the trainer-horse pair's emotions and to find the relationship of the HR between the trainer and the horse during the preliminary, natural-method training. The animals used in the study were 40 three-year-old purebred Arabian horses trained by two trainers from the Silversand Horsemanship School. Each trainer worked with 20 randomly selected horses, equally grouped by sex. The study was carried out during the first day of the training cycle. The aim was to have a horse accept a rider. The following items were subject to analysis: deconcentration, concentration, desensitizing, putting on the lungeing surcingle, and saddling. The emotional status of the horses and the trainers was evaluated based on HR variations which were measured by applying Polar S810 telemetric devices. The device produced continuous measurements with readings every 60 seconds. Two-factor analysis of variance and Pearson correlations were determined with the use of SAS software. Significance of differences between mean values was verified using Tukey's test. The results obtained revealed that the sex of the trained horses was not an important factor in the evaluation of trainer's emotions, despite the fact that fillies were characterized as having a more uniform HR. The trainer is very responsible for the emotions of a trained horse, especially at the beginning of training and during saddling. From a trainer's point of view, it is important to complete the horse concentration task as quickly as possible. The lack of an emotional relationship in the trainer-horse pair during some training elements, suggests that it is not only the trainer's experience, but mainly the trainer's personality that determines the probable success in natural-method work.

Key words: emotions, horses, natural methods, trainers

Emotional connections between a person and a horse can be compared to those observed between people and dogs (Lawrence, 1993). This relationship may be

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weaker between equestrian riders and sport horses. Emotional differences are particularly strong for people who feel some kind of a threat towards a large animal's domination (Brown, 1984). Specific attitudes of people toward a horse were demonstrated by Grignard (2001), who compared weak work relations between people and cattle. According to van Dierendonck and Goodwin (2005), recognition of emotional connections between people and horses has a wide spectrum of applications for horse breeding and training. Emotional connections can also be applied when evaluating the influence of mental features on utility performance improvement. Matching horses to people can enhance safety and minimize accidents in equitation (Visser et al., 2003). Understanding the horse's psyche is the basis of natural training methods (Kędzierski et al., 2012). Observations of horse behaviour, perceiving their needs as well as communication leading to a partnership between a person and a horse, are regarded as the most important features of the natural training. Verbal language and no compulsory methods are used and force is not allowed. It is necessary to learn the horse's body language, its psyche and emotions as well as a horse's perception of particular incidents (Fureix et al., 2009). The popularity of these methods over the last several years is associated with: the activity of the natural equestrian school founders, the improved horse psychology education and animal ethology and behaviour information for horse breeders and owners, technological facilities for the world-wide transfer of information, gradual domination of women within the horse industry, and a focus on animal welfare (Birke and Brandt, 2009). Although the founders of natural schools have emphasized that an emotional connection between a horse and a person is important to see some success, especially during the training of young horses (Silversand Natural Horsemanship Programme, 2003), the emotional connection has not yet been studied. The emotions of the trainer-horse pair were the subject of the present research study. The effect of a horse's sex and the effect of the trainer on heart rate (HR) of the trainer-horse pair were studied. The similarities and differences in the emotional levels of the trainer-horse pair during the training were also studied.

Material and methods

The study included 40 three-year-old Purebred Arabian horses that were selected for race training. The number of colts and fillies in the experimental group was equal. The day before the study, the horses were brought from the nursery to the box stalls. None of the horses had been trained earlier, hence their contacts with people were limited only to everyday and temporal nursery operations and feeding. Two women (trainer No 1 and trainer No 2) with the Silversand Horsemanship licence qualifying them to train horses, also participated in the experiments. The trainers had a similar amount of experience in young-horse training. Each trainer was given ten fillies and ten colts to train.

The study was carried out during the first day of the training of naïve horses. The first day focused on acceptance of the trainer by a horse. To begin with, the trainer

came into a box and tied a rope halter on the horse's head. Then, each horse was moved by a trainer from the stable to a manège, trained, and moved back to the stable, still by the same trainer. Each trainer worked with six or seven horses per day.

The training session, during which the study was performed, lasted 45–60 minutes depending on the individual abilities and needs of a particular horse. The decision for a completed session was made by the trainer responsible for a given horse. The training session was carried out in a round pen inside a manège and consisted of the following tasks appointed for the study analysis:

1 – gaining the horse's attention to be focused on a trainer, by means of body language and the negative reinforcement method,

2 – desensitizing the horse by means of presenting novel objects to the horse (e.g. saddle, saddle-blankets, etc.), getting the horse accustomed to the whip, saddle-blanket, and hand touch all over the animal's body, and getting the horse accustomed to the whips' movements over its head,

3 – preparation for saddling – putting on the lungeing surcingle and progressively tightening the surcingle while alternately forcing the horse to move around the round pen,

4 – saddling – putting on the saddle-blanket and saddle, and gradually tightening the girth while alternately forcing the horse to move around the round pen.

Consultations with trainers from particular tasks resulted in selecting five elements helpful in the characterization of the horse and trainer's emotional status. The following items were considered: 1 – symptoms of deconcentration (looking around, high raised head, visible muscular tension, vocalization) after introducing horses into the round pen, 2 – first glimpse of a trainer (directing ear towards a trainer, lower head and neck positioning as well as chewing and licking), 3 – desensitizing the horse's breastbone, chest sides, and back with a hand, 4 – putting on and the first tightening of the surcingle, 5 – saddling and the first tightening of the girth. Particular elements were referred to as deconcentration, concentration, desensitizing, putting on the surcingle, and saddling. The emotional status of horses and trainers was evaluated with the use of HR variations measured by applying Polar S810 telemetric devices mounted at the level of the horse and trainer's hearts, ten minutes before each training session. Simultaneous HR measurements of the horse and trainer before training, were started at the same moment after signalling. The measurement was continuous and readings were made every 60 seconds. A single mean HR value could be obtained during each minute of the recording, and it was expressed as beats/min (bpm). The devices were synchronized and a special button was used that made it possible to mark selected moments of training, and the simultaneous analysis of the course of HR (both of horse and trainer). Readings from the whole training as well as particular training tasks and elements subject to further analysis were then possible. Only data taken while the horses and their trainer were motionless were analysed. Data registered while horses or trainers were in motion, were not used in the analyses. Statistical analysis was possible due to SAS software. Variance analysis was performed for repeatable measurements (parametrization with sigma-restrictions, decomposition of effective hypotheses) taking into account the horse's sex and the trainer factors (Littel et al., 2002). Significance of differences between mean val-

ues was verified using Tukey's test. Due to the different HR levels of a horse and a trainer, such differences were not calculated for the horse-trainer system. Changes in the horse and trainer's HR during selected elements of the training, in relation to their average HR value from all selected elements of the training (mean HR), were determined as well. It was accepted that training elements characterized by a lower than average HR should reflect a low emotional response, and a higher than mean HR – the high emotional response. Pearson correlations were applied to verify the dependence between the horse and trainer's HR values during subsequent elements of the training.

Results

During the majority of the training elements for fillies, their HR was significantly higher than that recorded for the colts (Table 1). The reverse was observed at the moment when the horses were deconcentrated: the HR of the fillies was lower than that recorded for the colts. In colts and fillies, the mean values of HR registered during concentration did not differ significantly. The average HR for all the analysed training elements confirmed that there were significant differences between horses of both sexes. The mean trainer HR values did not depend on the sex of the trained horses, except for the horse concentration task. In this task, the trainers showed a significantly higher HR when working with colts than when working with fillies (Table 1).

The trainer factor was also analysed. It was found that horses trained by trainer No 2 were characterized by significantly higher HR values than those schooled by trainer No 1, except for the horse concentration task. There were no significant differences for this task. Trainer No 2 also had a significantly higher HR than trainer No 1, except during the deconcentrating or desensitizing horse training periods. Moreover, during the horse deconcentration and desensitization task, the means of the HRs differed significantly in the horse groups. When horses were concentrated, the HR value in trainer No 2 was significantly higher than that in trainer No 1. The putting on of the surcingle and the saddling showed that horses and their trainers had similar differences in HR values.

The relative increase or decrease in the HR values as compared to mean HR value in horses and their trainers, is presented in Figure 1. While looking at the results obtained in colts and fillies, it can be seen that during deconcentration, the increase in HR amounted to 53% and 15%, respectively, whereas in the HR of their trainers was below or equal to the average. The situation was similar within the filly group and referred, moreover, to putting on the surcingle (a 10% increase in HR in fillies only). The HR values of the trainers confirmed that their elevated emotions occurred, first of all, during the horse concentration task (an 11% increase in HR). In the horses, the decrease amounted to 26% in colts and 22% in fillies. A simultaneous low emotional response of horses and trainers was recorded during the colt and filly desensitizing task. A simultaneous increased, emotional response of the horse and its trainer was present during saddling.

Table 1. Mean HR values for horses and trainers during subsequent training elements

Training element	Deconcentration (5 min; n = 100)	Concentration (3 min; n = 60)	Desensitizing (10 min; n = 200)	Putting on the lungeing surcingle (5 min; n = 100)	Saddling (7 min; n = 140)	Mean HR (30 min; n = 600)
Horse's sex factor						
Colts						
mean	86.65 a	41.57 a	50.44 a	47.61 a	55.87 a	55.44 a
SD	17.45	19.62	16.33	19.12	19.51	17.88
Fillies						
mean	72.88 b	48.53 a	59.31 b	69.64 b	66.42 b	63.17 b
SD	10.03	19.67	17.32	19.71	16.56	12.43
Colt's trainers						
mean	98.66 a	112.75 a	90.54 a	103.16 a	104.68 a	101.97 a
SD	10.44	16.03	11.41	10.53	16.94	18.85
Filly's trainers						
mean	100.25 a	102.36 b	98.42 a	95.78 a	102.49 a	100.27 a
SD	13.12	18.54	10.03	11.42	13.98	13.73
Trainer factor						
Horses trained by trainer No 1						
mean	67.41 a	42.57 a	49.58 a	51.73 a	55.23 a	53.31 a
SD	10.23	19.22	18.86	19.98	18.03	15.88
Horses trained by trainer No 2						
mean	92.14 b	47.54 a	59.18 b	65.54 b	67.04 b	66.29 b
SD	16.34	19.67	17.96	19.44	17.12	14.04
Trainer No 1						
mean	98.46 a	102.88 a	93.77 a	91.84 a	96.47 a	96.69 a
SD	10.22	15.02	12.95	11.02	16.53	19.04
Trainer No 2						
mean	100.44 a	114.21 b	95.18 a	107.11 b	110.71 b	105.54 b
SD	14.04	19.45	11.05	10.78	12.11	12.67

a, b – mean values in rows marked with different letters compared separately for the horse's sex (comparison of HR for colts and fillies as well as HR for colt and filly trainers) and within trainer factor (comparison of HR for horses trained by trainer No 1 and trained by trainer No 2 as well as HR for trainer No 1 and trainer No 2) differ significantly at $P \leq 0.05$.

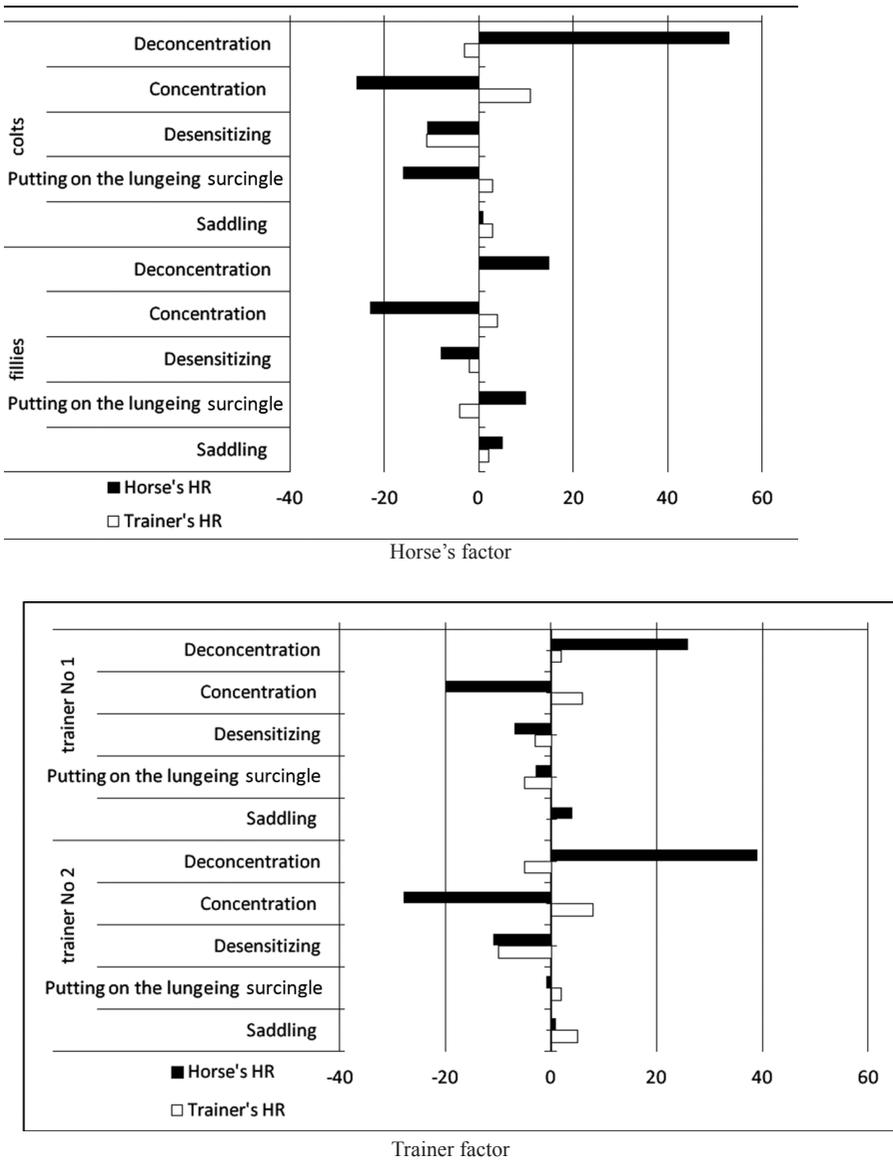


Figure 1. Changes in the horse and trainer's HR in relation to their average HR values during training elements

In both studied groups, horses had a high emotional response during the deconcentration task (Figure 1). The increase in the HR in relation to the average HR value amounted to 26% for horses trained by trainer No 1, and 39% for horses trained by trainer No 2. For other discussed training elements, the HR values for horses trained

by trainer No 1 and No 2 indicated low emotional response. The largest HR decrease (i.e. 20% and 28%) was present during the concentration task. The HR differences, as compared to the mean HR level for trainers, were less prominent in the case of the horses, and ranged from -10% (desensitizing) to +8% (concentration). Values obtained during other training elements indicated a low or moderate emotional level of the trainers. During desensitizing and putting on the surcingle tasks, both the horses and the trainer No 1 showed low emotional response. Such an inter-relationship was absent in the group trained by trainer No 2.

Table 2. Correlations between horse and trainer's HR during subsequent training elements

Training element	Deconcentration (n = 100)	Concentration (n = 60)	Desensitizing (n = 200)	Putting of lungeing surcingle (n = 100)	Saddling (n = 140)	Mean HR (n = 600)
Colts – colt's trainers						
r	-0.206*	-0.267*	0.146*	-0.099	0.131	-0.032
Fillies – filly's trainers						
r	0.185	-0.146	0.141*	0.086	0.109	0.063
Horses trained by trainer No 1 – trainer No 1						
r	0.199	-0.268*	0.148*	0.042	0.125	0.059
Horses trained by trainer No 2 – trainer No 2						
r	-0.111	-0.103	0.152*	-0.009	0.124	-0.047

* Correlation significant at $P \leq 0.05$.

Significant correlations within three training elements were recorded when analysing the associations between the colt and trainer's HR values (Table 2). A negative coefficient characterized deconcentration and concentration, while a positive one described the desensitizing. The latter also indicated some positive dependencies between the filly and the trainer's HR levels. The filly group had the only case of statistically significant dependence. Considering the trainer factor, three cases of significant correlation were recorded. Two of them occurred between the results for trainer No 1, including negative relations during concentration and positive ones during desensitizing. The HR values for horses and trainer No 2 during desensitizing were also positively connected.

Discussion

Horses are able to recognize a human's emotional status. If a rider or trainer cannot control their emotional status, it may directly affect the cooperation with an animal (Gehrke, 2009). There are interesting questions that need to be answered. What are the real emotions of the trainers who use natural methods? To what degree can trainers control their body's reactions; breathing, HR, muscle tension, etc. to minimize any interactions with the horse's emotions?

In this study, each horse was separated from the herd and then trained individually in a manège. The experience could be potentially stressful for a horse. However, the results of the Hartmann et al. (2011) study indicated that the presence of a horse-companion during training did not reduce stress in naïve horses, and was not efficient. The mean values of the HR obtained in that study were similar to those presented here. The philosophy of Natural Horsemanship indicates that the trainer takes leadership over the horse and the horse should concentrate on the human during training. The trainer's presence and body language should replace the presence of other horses (Silversand Natural Horsemanship Program, 2003).

The results of the present study are confirmed by the remarks of Kędzierski et al. (2012) indicating that colts react with lower emotional arousal than fillies during the preliminary training performed using natural methods. In the present study, particularly prominent differences were seen during the putting on of the surcingle, which can point out that colts are better emotionally prepared to work under the saddle than fillies. It is important to note that colts are able to expressively show their emotions when deconcentrated. Thus, work with colts can be successful only when they are focused on a rider or trainer. It also seems that the higher emotional excitation of fillies can somehow be compensated for by their better emotional balance. These remarks were confirmed by the study of Catalano et al. (2006). Young fillies, rather than colts, despite shorter training before their performance test, showed similar skills and better submission and reliability during training. The results of this study also indicate that HR values for colts and fillies confirming their different emotions, most often are not reflected in the HR of their trainers. Trainers do not pay attention to the sex of the horses being trained. However, it is difficult to compare results obtained in our study to those published in equine journals. The journal studies are focused on the influence of a rider's sex on horse emotions, and not the other way around (Robinson, 1999). Nevertheless, it can be supposed that the lack of trainer reaction can change in critical moments, i.e. when a horse shows considerable excitation. In this example, a person has to be the first to transiently overcome his/her emotions. This situation was illustrated in our study by HR results for trainers working with colts during deconcentration and the subsequent concentration phase. A similar opinion was expressed by Gold and Wegner (1995), who emphasized that in human, the consequence of repressing negative thoughts brings an intensified emotional response.

The influence of the trainer factor is clear in the display of both the horse and trainer's emotions. The trainer factor was especially prominent when horses were not concentrated on a trainer, and during particular technical tasks like putting on the surcingle, and saddling. It may be that the techniques applied by trainers of natural schools bring out the emotional responses of a horse. The skills as well as the personality of the trainer are required to deal with such responses. Similar suggestions were noted by Visser et al. (2008), who indicated that people often had tendencies to evoke negative emotions themselves during the work with an overly excited horse. It is important to note that regardless of the situation, the best remedy for controlling excessive excitement in a horse may be for the person to mask their own emotions (Brike, 2008). It is also worth emphasizing that when a horse's attention is focused on the trainer, the horse's emotional arousal is spectacularly low. When the horse is

focused on the trainer, the horse starts to chew and lick as well as put its head down (Krueger, 2007). According to Visser et al. (2009), such reactions are considered as signs of submission, relaxation, lowered vigilance, and decreased stress illustrated by higher heart rate variability and lower pulse. When such a state is reached, it is possible to start training.

Changes in the horse and trainer's emotional response levels due to particular training tasks, are another issue. Subsequent training elements are accompanied by different levels of emotional excitement in the horse. It can be easily guessed that intensive emotions are predominantly associated with those moments during the training where the horse is not focusing on a person. The first saddling is also an emotionally difficult element for a horse, especially for fillies. Horses suffer from neophobia. They show a strong fear when new stimuli appear around them, which is a serious problem for people (Górecka et al., 2007). The first saddling and the first time a person sits on the horse evoke intense fear in a horse. According to Schmidt et al. (2010), such actions should be carried out professionally.

Not every training task causes a similar emotional status in the horses as well as their trainers. Similar emotions appear only during the desensitizing and saddling. In other studied training elements, the emotional response of trainer-horse pair differs. Training elements accompanied by a HR increase or decrease in horses and trainers are also different depending on the trainer. People can react to the emotions of trained horses in different ways. A transfer of these emotions between the horse and trainer is not a constant feature during training. The results of this study are not completely consistent with the assumptions of the Natural Horsemanship schools. Our results are confirmed by the correlations between the HR values for horses and trainers during subsequent training elements. A unilateral connection between the horse and trainer's emotional status occurs very rarely and it was observed only during desensitizing. Nevertheless, divergent relations can be expected during de-concentration and concentration, while in other cases, no such tendencies were seen. Our results do not fully agree with those obtained by Gehrke (2007) who stated that there is a clear interaction between the emotional and physiological status of a horse and a person. This difference probably results from the different methodological assumptions of both authors.

It can be summarized that even natural methods of horse training based on understanding horse nature and psychology, do not lead to full control of the horse's emotions. Unpredictable changes in a horse's emotional status will always present a barrier to the achievement of a constant acceptable level of learning performance. Hausberger et al. (2004) expressed a similar opinion stating that various environmental factors had significant effects – among others – on the learning ability of horses.

It is concluded that:

1. Fillies were characterized by a higher but more uniform HR than colts, yet the sex of a horse trained with the natural method had no effect in the evaluation of a trainer's emotions.
2. The trainer is highly responsible for the emotions of a trained horse. During the first minutes of training there is a strong display of emotions. In order to soothe the

emotions of the horse's human partner, it is important at the start of the training, for the horse to achieve the concentration stage. It is worth paying attention to the saddling stage because the horses show quite emotional stance at this stage, even with the use of natural training methods.

3. Only during some of the training elements did horses and trainers have similar emotions. Even during these elements, the diversity in the horse's emotional response was dependent on the trainer factor. Not only a trainer's experiences, but particularly his/her personality determined the probable success of the natural method training.

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Reakcje emocjonalne koni i trenerów podczas treningu metodami naturalnymi

STRESZCZENIE

Celem pracy stała się ocena wpływu czynnika płci konia i czynnika trenera na liczbę skurczów serca (HR) pary człowiek – koń oraz określenie poziomu emocji wspomnianej pary i wzajemnego powiązania ich HR podczas wstępnego szkolenia młodych koni metodami naturalnymi. Materiał do badań stanowiły zapisy HR 40 trzyletnich koni czystej krwi oraz 2 trenerów szkoły Silversand Horsemanship, z których każdy pracował z 20 losowo wybranymi końmi, reprezentującymi w równej liczbie ogierki i klaczki. Badania przeprowadzono podczas pierwszego dnia cyklu treningowego, którego celem było przyjęcie jeźdźca przez konia. Analizie poddano elementy treningu opisane jako: dekoncentracja, koncentracja, odczulanie, zakładanie pasa do lonżowania oraz zakładanie siodła. Stan emocjonalny koni i trenerów oceniono na podstawie zmian HR mierzonych za pomocą urządzeń telemetrycznych Polar S810. Zapis pracy serca odbywał się w sposób ciągły z odczytem w interwałach co 60 s. W programie SAS zastosowano dwuczynnikową analizę wariancji oraz korelacje Pearsona. Istotność między średnimi określono testem *t* – Tukeya. Na podstawie uzyskanych wyników stwierdzono, że płeć szkolonych koni nie ma większego wpływu na emocje trenera, mimo iż klaczki charakteryzują się bardziej wyrównanym HR. Zaobserwować można natomiast znaczny wpływ osoby trenera na emocje konia, szczególnie w początkowej fazie treningu oraz w czasie zakładania siodła, istotne z punktu widzenia człowieka może być jak najszybsze uzyskanie koncentracji przez konia. Brak relacji emocjonalnych pary człowiek – koń w niektórych elementach szkolenia sugeruje, iż o sukcesie w pracy metodami naturalnymi będzie decydowało nie tylko wyszkolenie trenera, ale przede wszystkim cechy jego osobowości.