Testing the impact of a demonstrator horse and the human handler on a horse in a frightening situation

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In habituation training, it is a common practice to use mostly older and more experienced horses as demonstrator horses. Therefore, this study investigates if a horse's learning ability, heart rate and behaviour are influenced by observing a demonstrator horse and the experience level of the human handler.

In a novel object test, 16 warmblood horses were split into four equally sized groups and asked to cross a plastic tarp within ten minutes. In a 2x2 design, the groups varied on the one hand in the experience level of the human handler (low experience vs. experienced) and on the other hand in demonstrations by another horse (3 demonstrations by a demonstrator horse vs. demonstrator horse only present). During the experiment, the heart rate of the human handler and the horse, as well as the time and success (crossing tarp plastic tarp and all four hoofs are on the other side), were measured and the behaviour of the horse was observed and judged with an ethogram.

No significant difference between learning ability (finish time/ success rate), heart rate or behaviour were measured between the factors demonstrations or experience level of the human handler. Even though no statistical differences could be found some tendencies provide more insights into training. Comparing all four groups, the highest success rate (n= 4/4 succeeded) and most optimal behaviour were achieved by the group experienced human handler without demonstrations. Comparing the groups handled by an experienced and less experienced human handler the groups handled by an experienced human handler were 37.5 per cent more successful in novel object test.

Moreover, in the groups with demonstrations the horses had a 22 per cent lower average heart rate (without demonstrations: $\overline{HR}$= 91 bpm> demonstrations: $\overline{HR}$= 71 bpm), during the novel object test. Besides, the human handler differed next to the factor experience level significant in average heart rate. The less experienced human handler had a significantly higher average heart rate than the experienced human handler (independent sample t-test, P=0,000, P<0,05). Moreover, 75 per cent of all horse-human pairs had a significant correlation in heart rates in the novel object test (Pearson n>30; Spearman n>30; P<0,05).

Due to the relatively small sample size of horses and humans, all insignificant results should be viewed with caution.

The factor experienced human handler with a low heart rate influenced the horses' learning ability (success rate), heart rate and behaviour stronger positively than the factor use of a demonstration horse.

Keywords: novel object test, habituation, social learning, social transmission, heart rate