

## Picture recognition of con-specifics and facial expression in the horse (*Equus caballus*)

C. Hall, V. Rigg, M. Truswell, H. Owen

School of Animal, Rural and Environmental Sciences, Nottingham Trent University, Brackenhurst Campus, Southwell

The management of the domestic horse often requires them to be kept in isolation from con-specifics. Installing a picture of a horse (generally head and neck view) with a view to providing surrogate companionship has been shown to reduce the negative impact of this isolation. This study aimed firstly to compare the spontaneous response of horses (N=10) to a 2-D image of a horse's face (FP) with their response to a comparable abstract 2-D image (AP). Secondly, the spontaneous response of horses (N=20) to a 2-D image of a horse's face with the ears forward (PFP positive) was compared with the response to a 2-D image of a horse's face with the ears back (NFP negative). The posters were A1 sized and displayed in the horse's own stable. In study 1, one poster was displayed for 5 minutes and the horse's behaviour video-recorded. This was removed and the second poster was displayed for 5 minutes and the behaviour video-recorded. FP was displayed first for 5 of the horses and AP displayed first for the other 5. The video footage was observed and the behaviour of the horses and number of times they touched the poster recorded. For the purpose of identifying the area of the poster that was touched by the horse it was divided into 4 equal quarters (TL, TR, BL, BR). In FP the nose of the horse in the 2-D image was located in BL, eyes and ears in TL, chest and lower neck in BR and upper neck in TR. In AP each area contained similar but unique abstract patterns of comparable colour to FP. Differences in behaviour were found according to which poster was displayed. FP was touched significantly more than AP ( $p=0.001$ ) and was looked at more often ( $p=0.008$ ). With FP the horses spent significantly longer with their ears forward ( $p=0.008$ ) and licking and chewing ( $p=0.016$ ). When the number of touches per poster area was compared (FP and AP) a significant difference was found in the number of times that BL (nose) and BR (chest/lower neck) were touched ( $p=0.011$ ). Both areas were touched more frequently on FP, with BL being touched the most. In study 2 the same experimental protocol was used to compare responses

to positive (PFP) or negative (NFP) 2-D images of a horse's face (same horse in both PFP and NFP). Again, differences in behaviour were found in response to the two posters. PFP was touched significantly more than NFP ( $p=0.002$ ) and on both posters the area BL (nose) was touched more frequently than the other areas (PFP:  $p=0.02$ , NFP:  $p=0.01$ ). More ears back behaviour ( $p<0.001$ ) and more ear locked on behaviour ( $p=0.008$ ) was shown with NFP. The results of these studies indicate that horses can recognize 2-D images as con-specifics as well as responding to differences in facial expression. There is now the potential for further investigation into the importance of other visual cues in recognition and social interaction as well as the application of findings to enhance equine welfare.

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Corresponding author:  
Carol Hall

Tel:  
Fax: +44 1158485212  
E-mail: carol.hall@ntu.ac.uk