Horse-human interactions: Attention attribution and the use of human cues by domestic horses (*Equus caballus*).

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Recent research has shown that domestic dogs are particularly good at reading human attentional cues, often outperforming chimpanzees and hand reared wolves [1, 2]. It has been suggested that the close evolutionary relationship between humans and dogs has led to the development of this ability, however very few other species have been studied [3]. We tested the ability of 24 domestic horses to discriminate between an attentive and inattentive person when choosing whom to approach for food. While the attentive person faced forwards, the inattentive person either stood with their body turned 180° away from the subject (body orientation condition), stood with their body facing forwards but their head facing away (head orientation condition) or stood facing forwards but with their eyes closed (eyes closed condition). A fourth, mixed condition was included where the attentive person stood with their body facing away from the subjects but their head turned towards the subject while the inattentive person stood with their body facing the subject but their head turned away. Horses chose the attentive person significantly more often using the body cue ($n = 24$, $k = 19$, $p = 0.003$), the head cue ($n = 24$, $k = 18$, $p = 0.011$), and the eye cue ($n = 24$, $k = 19$, $p = 0.003$) but not the mixed cue ($n = 24$, $k = 13$, $p = 0.42$). In an additional pilot study, horses were tested in an object choice task. A human experimenter cued one of two buckets by either tapping the bucket (tap condition), orienting their body towards the bucket and pointing (body and point condition), pointing while facing forwards (point condition) or orienting their body towards the bucket (body condition). If the subjects chose the correct bucket they were rewarded. Subjects were able to use the tap cue ($n = 31$, $k = 21$, $p = 0.035$), body + point cue ($n = 31$, $k = 21$, $p = 0.035$) and the point cue ($n = 30$, $k = 21$, $p = 0.021$) but not the body cue ($n = 31$, $k = 11$, $p = 0.076$). These results taken together suggest that domestic horses are also very sensitive to human attentional cues, including gaze. Keywords: social cognition, animal-human interaction, horses, attention attribution, domestication

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