Are horses (*Equus caballus*) sensitive to human attentional states?

Ayaka Takimoto and Kazuo Fujita

Kyoto University, Japan.

The ability to reliably detect what others are attending to seems important for social species to interact with their partners. Domestic horses (*Equus caballus*) have lived with humans for over five thousand years, hence they might have developed sensitivity to human attention. In the present study, we investigated whether horses would discriminate the situation in which a human experimenter could see them from the situation in which she could not. Specifically, we tested whether horses understand the role of eyes in human attentional states, produce more visual gestures when the experimenter can see their begging behaviors and produce more auditory or tactile gestures when she can not. We used with a slight modification the paradigm that previously yielded support for chimpanzee understanding of human attention (Hostetter et al. 2007). Twelve horses were offered food by the experimenter who showed various attentional states in front of them. We scored frequency of begging behaviors by the horses. In experiment 1, we set three kinds of condition: hand over the eyes, hand over the mouth and away. In the last condition there was only a food in front of horses, which was a control condition. The results showed that horses produced more auditory or tactile begging behaviors when the experimenter's eyes were not visible than when her eyes were visible, but there was no difference in visual begging behaviors. In experiment 2, we set two kinds of condition: eyes closed and eyes open. The horses also produced more auditory or tactile begging behaviors when the experimenter's eyes were closed than when they were open. However, there was no difference in visual begging behaviors. These results show that horses discriminate the situation in which humans can see from that in which humans can not. Of special interest, horses increased only auditory or tactile behaviors, not all types of communicative behaviors, when the experimenter could not see their begging behaviors. This result suggests that horses are sensitive to human attentional states. Moreover, horses may do recognize the eyes as an important indicator of whether or not humans will respond to their behavior and they may be able to behave flexibly depending upon human attentional states.