
Probing the ascription of humanness to virtual characters in gaze-based social interaction: A combined eye-tracking and fMRI study

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Abstract

In order to investigate 'online' social interaction, we have developed an interactive eye-tracking paradigm allowing participants to engage in gaze-based interaction with a virtual character inside an MRI scanner. In multiple interaction blocks, participants decided whether the character had been controlled by another participant or a computer while the latter was always the case and the other participant a confederate. Each block included five trials in which the character would either follow the participant's gaze to one of two objects or look avert its gaze. The probability of gaze-following varied from zero to five out of five instances in two conditions. In the naive condition, the confederate was introduced as naive to the participant's task and told to look to either one of the two objects following the participant's choice. In the cooperative condition, the confederate was introduced as explicitly helpful and aware of the task. Humanness ascription increased with higher degrees of gaze-following in the naive condition. In the cooperative condition, humanness was also ascribed in cases of high degrees of gaze aversion. Cooperation thus causes a discounting of congruency in favor of contingency as a cue to humanness. fMRI results suggest that these disparate behavioral patterns are due to activation of distinct neural systems sustaining humanness ascription in the two conditions: Naive interaction correlated with increased activity of the posterior cingulate cortex, which plays a pivotal role in impression formation. In contrast, cooperative interaction was accompanied by activation of the rostral medial prefrontal cortex which is implicated in mindreading.

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