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**Format:** Abstract

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## Duration matters: dissociating neural correlates of detection and evaluation of social gaze.

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### Abstract

The interpretation of interpersonal gaze behavior requires the use of complex cognitive processes and guides social interactions. Among a variety of different gaze characteristics, gaze direction and gaze duration modulate crucially the meaning of the "social gaze". Nevertheless, prior neuroimaging studies disregarded the relevance of gaze duration by focusing on gaze direction only. The present functional magnetic resonance imaging (fMRI) study focused on the differentiation of these two gaze parameters. Therefore direct gaze displayed by virtual characters was contrasted with averted gaze and, additionally, systematically varied with respect to gaze duration (i.e., 1, 2.5 or 4 s). Consistent with prior findings, behavioral data showed that likeability was higher for direct than for averted gaze and increased linearly with increasing direct gaze duration. On the neural level, distinct brain regions were associated with the processing of gaze direction and gaze duration: (i) the comparison between direct and averted gaze revealed activations in bilateral occipito-temporal regions including the posterior superior temporal sulcus (pSTS); (ii) whereas increasing duration of direct gaze evoked differential neural responses in the medial prefrontal cortex (MPFC) including orbitofrontal and paracingulate regions. The results suggest two complementary cognitive processes related to different gaze parameters. On the one hand, the recruitment of multimodal sensory regions in the pSTS indicates detection of gaze direction via complex visual analysis. On the other hand, the involvement of the MPFC associated with outcome monitoring and mentalizing indicates higher-order social cognitive processes related to evaluation

of the ongoing communicational input conveyed by direct gaze duration.

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