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Evidence for automatic cheater detection as indexed by event related brain potentials

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The present study demonstrates that we can distinguish between cheater and cooperator faces below the level of conscious recognition evidenced by visual mismatch negativity (vMMN), an EEG correlate for automatic change detection process in the brain. Healthy volunteers were recruited for two experiments. In Exp. 1, photos of cheaters (90%) or cooperators (10%) taken in a previous socioeconomic game were briefly presented on a computer screen. The subjects' task was to respond to a central cross-flip (in 10% of the inter trial intervals) with button press, while EEG and reaction time (RT) were recorded. Two blocks (1000 trials/block) were applied, with reversed category ratio in the second block. The same protocol was repeated in Exp. 2, with similarly arranged control (neutral, non-action) images with different subjects. The amplitude of the vMMN difference wave was higher for rare cheater images on all electrode locations, and peak latencies were also shorter on posterior electrodes (Exp. 1). However, no differential vMMN was observed for neutral faces between the reversed oddball conditions in Exp. 2. Reaction time data showed that rare cheater images interfered with task performance, resulting longer response latencies. The present results indicate that the visual system automatically registers regularity in facial expressions of persons intending to cooperate or cheat and automatic difference detection is more efficient when photos taken at the moment of decision are used.