
Relation between electrophysiological correlates of affective conditioning and the discriminability and detectability of stimuli in metacontrast masking

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Abstract

In a conditioning study pairing simple grating stimuli with affective pictures, Stolarova, Keil and Moratti (2006) found a more negative C1 component, an early visual inflection in EEG, peaking at 65-90 ms, for negatively conditioned gratings compared to neutral ones. We expand these results by examining the relationship between the emotional effect and the stimulus visibility by combining two paradigms - affective conditioning and metacontrast masking. We study the interplay of the affective value of a stimulus and its visibility by manipulating the latter in several consecutive steps. One of two grating stimuli of different orientation was combined with an aversive auditory startle in a trace conditioning paradigm. This grating thereby acquired a negative emotional valence, the other was to remain neutral. Before, during and after conditioning, we obtained metacontrast masking functions of the two gratings by varying the stimulus onset asynchrony (SOA) between target and mask. Simultaneously, MEG and EEG were recorded. On a behavioral level we found a dissociation between detection and discrimination performance from short to longer SOAs: At short SOAs, subjects reliably perceive the presence of a target stimulus, yet fail to identify it. With increasing SOA, the discrimination improves while detection performance deteriorates. These effects occur independently of the affective value of the target stimulus. We discuss which neural correlates of affective perception co-vary with the degree of stimulus detectability and/or the degree of stimulus discriminability.

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