ATTENTION MODULATES THE MISMATCH NEGATIVITY EVOKED BY FEATURE CONJUNCTIONS

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Feature binding is an essential aspect of sensory perception, since most realistic objects can be identified only by grasping conjunctions of multiple features and their patterns. Psychophysiological mechanisms of this phenomenon are still under debate; importantly, mutually exclusive points of view exist concerning the role of attention in feature binding. The current study aimed at testing the hypothesis that mismatch negativity (MMN) to specific feature conjunctions may depend upon attention. Two experiments were conducted in the auditory and visual modalities respectively. Within each experiment, we used four stimuli that differed in two distinctive features, with two feature conjunctions designated as standards, and two feature conjunctions designated as deviants. Features used in the auditory modality were tone pitch and location; Gabor grating orientation and spatial frequency were used in the visual modality. Attentional modulation involved four conditions: selective attention to targets, selective ignoring of nontargets, nonselective attention within a given modality, and deviation of attention to a task in a different modality. The basic finding was that MMN was evident only in conditions of within-modality attention. MMN was reduced or abolished in response to ignored feature conjunctions, as well as in conditions of the cross-modal distraction of attention. Thus, contrary to previous studies of MMN under feature conjunctions, our data show that the preattentive stage of feature conjunction processing requires a proper top-down attentional influence.

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