Title
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SEQUENTIAL CHANGES IN THE AUDITORY EVOKED POTENTIALS DURING TARGET DETECTION

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Stimulus sequence effects were examined in auditory detection tasks (oddball paradigm) that required (a) a button press to targets and (b) a mental count of the targets. Sequence effects were evaluated by sorting and averaging single trials to nontargets relative to the position in the sequence following a target. Normal subjects (N = 13) listened to a series of 300 tones consisting of 240 nontargets (low tone) and 60 targets (high tone). Targets occurred randomly in the sequence with the restriction that the succession of two targets was not allowed. Tones (250 ms) were presented every 2 s. Long time constant (16 s) recordings were made from midline and lateral scalp electrode placements. Sweep duration was 1.44 s and included a 0.76-s prestimulus period. Nontarget potentials varied in amplitude as a function of position following the target. A slow prestimulus negative potential (readiness potential, RP), the N100, and a late slow wave were smaller to nontargets immediately following the targets than to nontargets immediately before the targets. The amplitudes of these components recovered as a linear function of the number of nontargets in the sequence. P200 amplitude was larger to nontargets following the target than to nontargets immediately preceding the targets. Sequential changes (RP, N100) were either absent or reduced in the count condition; P200 amplitude changed for both press and count conditions. The results describe the presence of brain activity subserving response preparation and stimulus processing that are systematically related to the position of the stimulus in a sequence.