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ERP MEASURES OF SHORT-TERM MEMORY SCANNING

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Auditory event-related potentials (ERPs) were studied during the scanning of short-term memory stores. Subjects were presented lists of digits and asked to perform two different processes: a digit memorization (MEM) task or a digit classification (ODD/EVEN) task. In both tasks, lists of 1, 3, 5, or 7 digits (MEM: digits 0–12, ODD/EVEN: digits 1–12) were presented, followed by a probe digit. In the MEM task, subjects made an appropriate button press whether or not the probe was a member of the preceding list. In the ODD/EVEN task, subjects decided whether the probe was odd or even. Accuracy decreased and reaction times (RTs) increased in the MEM task as list size increased. In the ODD/EVEN task, accuracy and RTs did not change with list size. Three ERP components recorded after probe presentation were affected by the two tasks. An early negative component, N180, decreased in amplitude as list size increased in the MEM task but did not change with list size in the ODD/EVEN task. A lateralized negativity (N485), maximal at C3, and a later positivity (P800), maximal at Pz, were affected by list size with some measures (amplitude, latency, duration) distinguishing between the two tasks. The results suggest that early and late brain events after a probe in a memory scanning task have certain attributes that can be related to the scanning of short-term memory stores.