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EARLY DECISION-RELATED CORTICAL POTENTIAL

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Starr, A. (University of California at Irvine) **An early decision-related cortical potential.** Several decision-related cortical potential components with latencies between 190 and 350 msec have been described. This study describes an earlier member of this family.

Forty-seven subjects, age 6 to 76 yrs, were tested. Evoked potentials were recorded to a random sequence of binaural 60 dB SL tone-bursts presented (1.5 sec ISI) in two attention conditions. Eighty-five percent of the tones were 1000 Hz and fifteen percent were 2000 Hz. In one condition (Ignore) subjects ignored the tones while reading. In the other (Attend) they mentally counted the occurrences of the rare tone. Difference waveforms for each subject were constructed by subtracting the averaged waveform for each stimulus and electrode site (F_z , C_z , P_z , C_3 , C_4 , P_3 , P_4) in the Ignore condition from the corresponding one in the Attend condition.

Difference waveforms for the rare stimulus were characterized by a negative peak at 218 msec (N200) and a positive peak at 342 msec (P350). Also revealed was a new positive peak with a peak latency of 165 msec (P165). None of these components were found for the frequent stimulus.

P165 was absent in an eye-artifact channel and was unchanged by muscle tension, thus supporting a neural origin. Repeated testing of one subject over two months showed P165 to be extremely reproducible, with a latency standard deviation of 13 msec.

The P165 component does not represent an enhancement of the usual P200 component because it is significantly earlier and has a different scalp distribution. It is also unlikely that P165 is related to attention-related processes underlying previously reported N100 enhancements because it is absent in the frequent-stimulus waveforms. Most likely P165 is an early manifestation of decision processes related to the N200 and P350 components.