Separable Parietal and Temporal Generators of P3 in Dichotic Tonal and Phonetic Oddball Tasks:
A Principal Components Analysis (PCA) of Current Source Density (CSD) Waves in Healthy Adults and Depressed Patients.


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Introduction

The P3 component is a positive-going wave that follows the N1 component in event-related potentials (ERPs) and is thought to reflect the attentional encoding of salient stimuli. In dichotic listening tasks, P3 is thought to be generated by the parietal cortex, while in oddball tasks, P3 is thought to be generated by the temporal cortex.

Dichotic Oddball Tasks

Targets were selected from dichotic listening tasks to produce right (consonant-vowel syllables) and left (consonant-vowels) targets in healthy adults, and similar to previous tasks in dichotic oddball tasks.

Tonal

Phonetic

Healthy Adults (n = 20)

Depressed Patients (n = 38)

Methods

Participants: 20 healthy adults (31.3% of age, 19.5±2.1 years), all subjects right-handed (Edinburgh Handedness Inventory: Cronbach’s α = 76.8±7.5%)

ERP factors: ERPs from 30 scalp sites (4×4) referenced to a nose (10,000 g, 0.3–30 Hz band-pass, Nyquist = 0.5 Hz) were collected at 1000 Hz during a dichotic listening task.

Standard CSD topographic plots were created using the CSD toolbox (Nelissen & van Drongelen, 2003) to visualize the source distribution of the EEG activity.

Results

The results showed that the P3 component was significantly larger in healthy adults than in depressed patients.

Conclusions

The findings suggest that the P3 component is generated by different brain regions in dichotic and oddball tasks.

References


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