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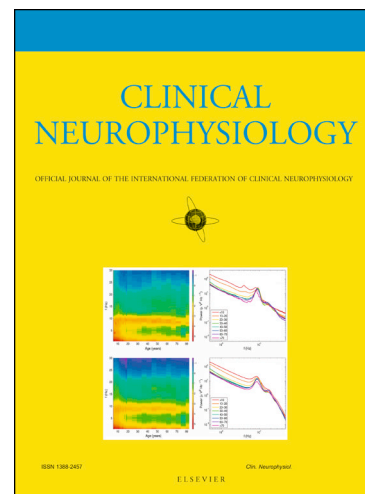
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## Role of inter-trial phase coherence in atypical auditory evoked potentials to speech and nonspeech stimuli in children with autism

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### Abstract

**Objective:** This autism study investigated how inter-trial phase coherence (ITPC) drives abnormalities in auditory evoked potential (AEP) responses for speech and nonspeech stimuli.

**Methods:** Auditory P1-N2 responses and ITPCs in the theta band (4~7 Hz) for pure tones and words were assessed with EEG data from 15 school-age children with autism and 16 age-matched typically developing (TD) controls.

**Results:** The autism group showed enhanced P1 and reduced N2 for both speech and nonspeech stimuli in comparison with the TD group. Group differences were also found with enhanced theta ITPC for P1 followed by ITPC reduction for N2 in the autism group. The ITPC values were significant predictors of P1 and N2 amplitudes in both groups.

**Conclusions:** Abnormal trial-to-trial phase synchrony plays an important role in AEP atypicalities in children with autism. ITPC-driven enhancement as well as attenuation in different AEP components may coexist, depending on the stage of information processing.

**Significance:** It is necessary to examine the time course of auditory evoked potentials and the corresponding inter-trial coherence of neural oscillatory activities to better understand hyper- and hypo- sensitive responses in autism, which has important implications for sensory based treatment.

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