

A longitudinal, within-person investigation of the association between the P3 ERP component and externalizing behavior problems in young children

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Abstract

BACKGROUND:

Externalizing problems, including aggression and conduct problems, are thought to involve impaired attentional capacities. Previous research suggests that the P3 event-related potential (ERP) component is an index of attentional processing, and diminished P3 amplitudes to infrequent stimuli have been shown to be associated with externalizing problems and attention-deficit/hyperactivity disorder (ADHD). However, the vast majority of this prior work has been cross-sectional and has not examined young children. The present study is the first investigation of whether within-individual changes in P3 amplitude predict changes in externalizing problems, providing a stronger test of developmental process.

METHOD:

Participants included a community sample of children (N = 153) followed longitudinally at 30, 36, and 42 months of age. Children completed an oddball task while ERP data were recorded. Parents rated their children's aggression and ADHD symptoms.

RESULTS:

Children's within-individual changes in the P3 amplitude predicted concomitant within-child changes in their aggression such that smaller P3 amplitudes (relative to a child's own mean) were associated with more aggression symptoms. However, changes in P3 amplitudes were not significantly associated with ADHD symptoms.

CONCLUSIONS:

Findings suggest that the P3 may play a role in development of aggression, but do not support the notion that the P3 plays a role in development of early ADHD symptoms.