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Typical and atypical neural mechanisms support spoken word processing in Angelman syndrome

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Highlights

- Passive word-pseudoword differentiation examined in Angelman syndrome (AS).
- Typical-like left lateralized responses to words observed in children and adults with AS.
- Reduced memory response to words in AS relative to typically developing controls.
- More typical word-pseudoword differentiation associated with more adaptive behaviors.

Abstract

Angelman syndrome (AS) is known to affect expressive and receptive communication abilities. This study examined individual differences in neural mechanisms underlying speech processing in children with AS (n = 24, M age = 10.01 years) and typical development (n = 30, M age = 10.82 years) using auditory event-related potentials during passive listening to common English words and novel pseudowords. A group of adults with AS (n = 7, M = 31.78 years) provided data about the upper developmental range. The typically developing group demonstrated the expected more negative amplitudes in response to words than pseudowords within 250–

500 ms after stimulus onset at the left temporal scalp region. Children and adults with AS exhibited a similar left-lateralized pattern of word-pseudoword differentiation at temporal and parietal regions, but not the midline parietal memory response for known words observed in the typically developing group, suggesting typical-like word-pseudoword differentiation along with possible alterations in the automatic recall of word meaning. These results have important implications for understanding receptive and expressive communication processes in AS and support the use of auditory neural responses for characterizing individual differences in neurodevelopmental disorders with limited speech.

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Keywords

AuditoryERPAngelman syndromeReceptiveSpeechWord

Data availability

Data will be made available on request.

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