Language, Gesture, and Looking Patterns in Viewing of Social Interactions in Children with Autism Spectrum Disorder: Results from the ABC-CT Interim Analysis


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Background

• Individuals with autism spectrum disorder (ASD) exhibit varying levels of social communication difficulties, impacting both their language and gesture skills.2
• Prior research indicates that decreased attention to faces when viewing social interactions correlates with lower social and language abilities in ASD1,4.
• However, it remains unclear how the presence of spoken language during viewed social interactions influences looking patterns.

Objective: To investigate relationships among linguistic and gestural abilities with looking patterns to videos of social interactions with and without spoken language.

Methods

ABC-CT Study Details

• Methodologically rigorous, multi-site evaluation of potential biomarkers in a large sample of children with and without ASD.
• Longitudinal study evaluating children across 6 months, including clinical assessment, electroencephalogram (EEG), and eye-tracking (ET).

Inclusion/Exclusion Criteria

• ASD Group: Age 6-11; met criteria for ASD based onADOS-2, ADI-R, and DSM-5; IQ 80-150; stable medication for 8 weeks; no sensory/motor impairments, epilepsy, or genetic/neurological conditions.
• Typically Developing (TD) Group: Age 6-11; IQ 80-150; stable medication for 8 weeks; no sibling with ASD; no sensory/motor impairments, epilepsy, or genetic/neurological conditions; no clinically significant scores on the Child and Adolescent Symptom Inventory, 9th Edition (CAISI-9).

Participants Demographics

<table>
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<tr>
<th>n (Female)</th>
<th>Age (SD)</th>
<th>IQ (SD)</th>
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<tbody>
<tr>
<td>ASD</td>
<td>161 (32)</td>
<td>87.1 (1.62)</td>
</tr>
<tr>
<td>TD</td>
<td>83 (17)</td>
<td>87.3 (1.77)</td>
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**Diagnosis groups did not differ on age but were significantly different on sex (F(1,232)=8.514, p<0.01) and IQ (F(1,232)=52.746, p<0.001).**

Measures

• Vineland Adaptive Behavior Scales, 3rd Edition: Clinician-administered caregiver interview used to assess adaptive behavior functioning, including communication.
• Expressive Language.
• Receptive v-score.
• Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2): Semi-structured, play-based assessment used to evaluate and diagnose ASD across age, developmental level, and language skills.
• Gesture Codes

ET Acquisition

• Binocular eye-tracking data were collected at 500 Hz using SR EyeLink 1000 Plus.

Results

Speech and Attention to Faces Compared to Activity

• Across both paradigms, children with ASD looked significantly less to faces compared to activity than TD children (F(1,223)=7.625, p=0.006).
• Children with ASD looked significantly less to faces compared to activity during videos with speech (F(1,223)=32.931, p<0.001).
• In the TD group, there was no significant difference in looking time to faces compared to activity between speech and non-speech videos.

Discussion

• In children with ASD, higher Vineland-3 expressive language scores significantly correlated with greater looking time to faces during the videos with speech (r(161)=0.203, p=0.010).
• In TD children, higher Vineland-3 receptive language scores significantly correlated with greater looking time to faces during the videos with speech (r(63)=0.269, p=0.033).
• ADOS-2 gesture scores did not significantly correlate with looking time to faces during non-speech or speech videos in either diagnostic group.

References


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