Autistic children utilize different visual processing strategies during social perception: Results from the Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

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Objective

Quantify visual processing strategies during social perception in autistic and neurotypical children

Evaluate relationship of visual processing strategy and social, neuropsychological, and attention domains of function in autism

Background

Reduced social attention is a hallmark feature of autism

Studies of social attention in autism rely on summary statistics (total and average looking times) that do not capture the patterns over time during social perception

Using a computational modeling approach to model the spatiotemporal dynamics of eye movement patterns provides richer insight into how autistic individuals may process social information

Method

Autism Biomarkers Consortium for Clinical Trials (ABC-CT)

Large (N = 399), multi-site evaluating multiple eye-tracking (e.g., social scenes, visual exploration, activity monitoring) and electroencephalography assays in autistic and neurotypical children across multiple time points. Only a subset of ET assays are presented here

Assessment measures

Vineland Adaptive Behavior Scales (VABS-3) – adaptive social function

Social Responsiveness Scale (SRS-2) – social functioning

Child and Adolescent Symptom Inventory (CASI-5) - Attention

A Developmental Neuropsychological Assessment (NEPSY-II) – Face memory

Results

Autistic children used more exploratory visual processing strategy during social perception

Conclusions

Autistic children tended to use a more exploratory visual processing strategy that was characterized by less efficient and rapid looking at faces, and a lower probability of initial looking to faces early in the visual processing sequence.

Visual processing strategies generalized to all ET assays, were stable across 6 months, and were linked with adaptive social functioning and face memory, but not attention.

References


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Table 1: Autism and neurotypical children comparison

<table>
<thead>
<tr>
<th></th>
<th>Autistic</th>
<th>Neurotypical</th>
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<tbody>
<tr>
<td>N</td>
<td>280</td>
<td>119</td>
</tr>
<tr>
<td>% Male</td>
<td>76.8%</td>
<td>69.7%</td>
</tr>
<tr>
<td>Age (years)</td>
<td>8.55 (1.64)</td>
<td>8.51 (1.61)</td>
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<tr>
<td>Full Scale IQ</td>
<td>96.58 (18.11)</td>
<td>115.12 (12.55)</td>
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<tr>
<td>SRS-2 Total</td>
<td>73.54 (10.92)</td>
<td>42.57 (4.66)</td>
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<tr>
<td>VABS-3 ABC</td>
<td>73.37 (11.14)</td>
<td>102.74 (9.84)</td>
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Table 2: Visual processing strategies

- Exploratory pattern: Fewer face ROIs, less probability of initially fixating to faces
- Focused pattern: Small face ROIs, higher probability of initially fixating to faces

References


