Increased task-specific attentional focus in 2-year-old toddlers with ASD

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Visual Search
A number of studies have demonstrated that children with ASD are faster or more successful than typically developing (TD) controls (Plaisted et al., 1998; for a review, see Kaldy et al., 2013). We found this effect as early as 2.5 years of age (Kaldy et al., 2011).

Two competing explanations: Atypical Perception or Attention?

Enhanced perceptual discrimination: both low-level (discrimination) and mid-level (pattern detection) perceptual processes are enhanced in ASD (e.g. Mottron et al., 2006).

Greater attentional engagement: ASD children persevere longer on a task displaying more task-focused attention compared to TD. Our recent pupil analyses supported this explanation (Blaser et al., under review).

Predictions
We expect that the introduction of a novel ‘oddball’ item – a lure to throw participants off-task – to be more distracting to TD toddlers.

Participants
9 ASD toddlers (M: 24.8 +/- 5.4 months, females: 1) and 15 TD toddlers (M: 24.8 +/- 5.4 months, females: 8) participated. 2 TD and 1 ASD toddler were excluded due to fussiness.

Mullen Scales of Early Learning

<table>
<thead>
<tr>
<th></th>
<th>Visual Reception</th>
<th>Fine Motor</th>
<th>Receptive Language</th>
<th>Expressive Language</th>
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</thead>
<tbody>
<tr>
<td>TD</td>
<td>54.8 (2.3)</td>
<td>47.8 (2.0)</td>
<td>51.9 (2.6)</td>
<td>52.0 (2.3)</td>
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<tr>
<td>ASD</td>
<td>37.6 (3.0)</td>
<td>35.9 (3.9)</td>
<td>23.2 (2.2)</td>
<td>33.9 (3.6)</td>
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*Mean (SE)*

We used a Tobii T120 eye tracker to measure eye movements.

Results: The distracting effect of the oddball

1. Both groups noticed the oddball, and both groups spent more time looking at it compared to a regular distractor (that was matched on relative spatial position)
2. Both groups’ search performance was affected by the oddball, but the distraction effect was weaker in ASD (-9.2% vs. -16.7%)

Conclusions

We replicated our main group effect found in Kaldy et al. (2011): ASD toddlers were significantly more successful than TD toddlers at finding the target in our task.

We hypothesized that if toddlers with ASD in fact look for the target with an increased attentional focus, then they will be less distractible. We found that the performance of ASD toddlers was less affected by the introduction of a distracting oddball item.

References


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