Investigating typically development of metalinguistic skills.

The TD group included seven typically developing children, while the ASD group included seven children with Autism Spectrum Disorder (ASD) who were involved in a longitudinal study designed to longitudinally examine changes in metalinguistic development.

Little is known about the course of metalinguistic development in children with ASD, and how language is taught to this population.

This longitudinal study examined changes in metalinguistic abilities over one year (between Time 1 and 2), and compared growth in children with ASD and those with typical development (TD). Specifically, our research questions were:

1. At Time 1, is there a significant difference in metalinguistic skills between the ASD and TD groups?
2. Are there significant differences in metalinguistic skills between Time 1 and 2 for the ASD and TD groups?
3. Is there a significant difference in metalinguistic growth between the ASD and TD groups?

Participants

- The ASD group included seven 6- to 9-year-old children with ASD who were involved in a longitudinal study designed to evaluate the use of language sampling as an effective outcome measure.
- The TD group included seven age-, sex-, and ethnicity-matched TD children who were part of another longitudinal study investigating typically development of metalinguistic skills.

### Procedures and Statistical Analysis

- At two time points that were one year apart, all participants completed a metalinguistic probe that consisted of the following three tasks:
  1. **Task 1: Word Swap (WS)**
     - Suppose that everyone in the world agreed that from now on we will call the sun the moon and the moon will be called the sun. All we are going to do is change the names.
     - What would this be? (moon)
     - What will the sky look like when you see this? (blue)
  2. **Task 2: Wug Task (WUG)**
     - I am going to show you some pictures and say some sentences. Sometimes a word will be missing. I want you to tell me the missing word.
     - This is a wug.
     - Now there is another one. There are two of them. There are two ____.
  3. **Task 3: Grammatical Judgment (GJ)**
     - Wobo is a creature from outer space. Sometimes she says things the wrong way. Sometimes she says things that are silly. You need to tell her when she says a sentence the wrong way.
     - Apples grow on noses.
     - I have two pencil.

- For Research Questions 1 and 3, we conducted a series of non-parametric t-tests with two tails for each task and overall performance. For Research Question 2, we employed non-parametric paired t-tests with one tail (assuming growth after a 1-year time period, which was significant) for each task and overall performance.

<table>
<thead>
<tr>
<th>Time 1 (T1)</th>
<th>ASD</th>
<th>TD</th>
<th>p (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WS</td>
<td>0.60</td>
<td>0.69</td>
<td>0.50 (0.38)</td>
</tr>
<tr>
<td>WUG</td>
<td>0.54</td>
<td>0.63</td>
<td>0.54 (0.33)</td>
</tr>
<tr>
<td>GJ</td>
<td>0.78</td>
<td>0.76</td>
<td>0.82 (0.12)</td>
</tr>
<tr>
<td>Overall</td>
<td>0.63</td>
<td>0.69</td>
<td>0.61 (0.32)</td>
</tr>
</tbody>
</table>

**Research Question 1 (ASD vs. TD at T1)**

- No significant differences between groups on any tasks (all p’s > 0.49).

**Research Question 2 (T1 vs. T2 for each group)**

- For ASD, significant differences were found based on WS (t = -5.35, p < .01), WUG (t = -3.01, p = .01), and overall performance (t = -3.72, p < .01).
- For TD, significant differences were found based on WUG (t = -2.36, p = .03) and overall performance (t = -2.01, p = .04).

**Research Question 3 (ASD vs. TD: T2-T1)**

- Significant difference in growth was found based on WS (t = 7.78, p < 0.01) between ASD (M = 0.32, SD = 0.16) and TD (M = -0.07, SD = 0.14).

**Conclusions**

- The metalinguistic skills of children with ASD and children developing typically are not significantly different.
- Both groups of children demonstrated overall growth in metalinguistic abilities over a 1-year time period, which was likely driven by changes in performance on the Wug Task. This task may be sensitive in measuring metalinguistic development for children within this age range.
- The ASD group had greater gains on the Word Swap task than the TD group, suggesting that children with ASD may have a greater advantage in metalinguistic abilities than their TD peers.

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