Autistic traits are associated with synesthesia, but autistic and non-autistic adults perform the same on an objectively measured synesthesia task

### Results

20% of the ASD group reported experiencing grapheme-color synesthesia, compared to 11% of the NA group, p= .15.

- No difference in objective synesthesia (CD scores): 13% of the ASD group and 15% of the NA group scored below the CD threshold, p= .92.

- 7/120 (5.8%) autistic and 2/47 (4.3%) NA self-reported synesthesia and had highly color consistent responses.
  - Most consistent scores: 0, 2, 4, 5, 6, 9; B, H, M, R, T, Z.
  - CD and AQ-Short scores: correlated r (165)= .21, p=.007.

- Both groups: those with more circumscribed interests had more color consistent responses: X²(8, N=167)= 24.3, p= .002

### Conclusions

- Increased prevalence (but not significantly) of self-reported synesthesia in autism; no difference in objectively-measured synesthesia between groups.
- Correlation between autism traits and grapheme-color synesthesia.
- Advantages and disadvantages of increased sensory processing in ASD:
  - Information integration
  - Enhancing memory
  - Enriched experiences
  - Sensory overload
  - Distraction
- Limitations: mildly affected sample, no sensory questionnaire.

### References


### Methods

Participants:
- Recruited through Prolific.

Measures:
- Autism Spectrum Quotient (AQ-Short).
- Yale Special Interests Survey (YSIS).
- Two-trial synesthesia assessment, selecting on an RGB color wheel the best match for graphemes A-Z and 0-9.

Analysis:
- RGB Euclidean distance formula used to calculate color distance (CD) scores.
- Lower CD scores indicate greater consistency.
- Threshold of 0.32: cut-off for grapheme-color synesthesia.

Table:

<table>
<thead>
<tr>
<th>Autistic (ASD, n=120)</th>
<th>Non-autistic (NA, n=47)</th>
<th>F(df, p)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>32 (10.19)</td>
<td>34 (11.77)</td>
<td>3.65 058</td>
</tr>
<tr>
<td>Gender</td>
<td>43% male, 4% female, 7% non-binary or agender</td>
<td>50% male, 4% female, 9% non-binary or agender</td>
<td>10.25 009</td>
</tr>
<tr>
<td>Race</td>
<td>80% white, 2% Asian, 2% other multiracial, 2% unknown</td>
<td>70% white, 3% Asian, 5% other multiracial, 2% unknown</td>
<td>5.01 287</td>
</tr>
<tr>
<td>Bilingual (Y/N)</td>
<td>18%</td>
<td>28%</td>
<td>1.97 160</td>
</tr>
<tr>
<td>AQ-Short Score</td>
<td>19 (5.81)</td>
<td>12 (4.84)</td>
<td>3.21 075</td>
</tr>
<tr>
<td>Color Distance Score</td>
<td>53 (19)</td>
<td>51 (21)</td>
<td>.49 526</td>
</tr>
<tr>
<td>Special Interests</td>
<td>2 (2.01)</td>
<td>1 (1.40)</td>
<td>8.02 432</td>
</tr>
<tr>
<td>Word, Number, or Color Special Interests (Y/N)</td>
<td>28%</td>
<td>11%</td>
<td>2.90 089</td>
</tr>
<tr>
<td>Hyperlexia Letters, Number, or Both</td>
<td>61%</td>
<td>47%</td>
<td>3.33 544</td>
</tr>
</tbody>
</table>

Note: Data presented as M(SD) or %