Spatial Heterogeneity in Localization Biases Predicts Crowding Performance
Zainab Haseeb, Benjamin Wolfe, Anna Kosovicheva
Department of Psychology,
University of Toronto Mississauga

Do idiosyncrasies in perceived spacing across the visual field contribute to individual differences in crowding?

**Methods**

**Crowding Task**
- Fixation dot 500 ms
- Clocks 150 ms
- Wait for response

**Perceived Spacing Task**
- Fixation dot 500 ms
- Gaussian Blobs (Variable spacing) 150 ms
- Wait for response

4AFC: Clock Orientation
2AFC: Smaller or larger than average?

**N=15**

<table>
<thead>
<tr>
<th>Physical spacing (º)</th>
<th>Proportion of 'larger' responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Stimulus Locations**

<table>
<thead>
<tr>
<th>Target-flanker spacing (º)</th>
<th>Proportion of correct responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>2</td>
<td>0.15</td>
</tr>
<tr>
<td>4</td>
<td>0.25</td>
</tr>
<tr>
<td>6</td>
<td>0.35</td>
</tr>
<tr>
<td>8</td>
<td>0.45</td>
</tr>
</tbody>
</table>

**Critical spacing**

$r = 0.296; p < 0.001$

$r = 0.14; p = 0.06$

$r = 0.27; p < 0.001$

$r = 0.30; p < 0.001$

**References**


**Results**

**Sensitivity also contributes to crowding strength**

$r = 0.26; p < 0.001$

$r = 0.296; p < 0.001$

**Conclusions**

- Individual differences in perceived spacing at different visual field locations propagate to crowding
- Idiosyncratic perceptual **biases** and **sensitivity** independently contribute to variation in crowding

**Idiosyncratic biases in perceived spacing contribute to variation in crowding**

- Larger perceived spacing linked to weaker crowding

- Sensitivity and bias are weakly related

- Partial correlations controlling for each measure show independent contributions of JND and PSE to crowding

**Conclusion**

Idiosyncratic biases in perceived spacing across the visual field contribute to individual differences in crowding.