BACKGROUND

- Impaired phonological awareness & verbal short-term memory tasks in
  - Poor readers (Wagner & Torgesen, 1987; Hulme & Snowling, 2014; Ramus et al., 2003; Szenkovits & Ramus, 2005)
  - Individuals with autism spectrum disorder (ASD) (Gerdtz & Bernier, 2011; Lindgren et al., 2009; Williams, Payne & Marshall, 2013)

- Individuals with a spectrum disorder (ASD) (Gerdts & Bernier, 2011; Lindgren et al., 2009; Williams, Payne & Marshall, 2013)

PARTICIPANTS

<table>
<thead>
<tr>
<th>Poor Readers</th>
<th>ASD</th>
<th>Typically Developing (TD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Age</td>
<td>11.8 (3.27)</td>
<td>11.3 (3.48)</td>
</tr>
<tr>
<td>IQ¹</td>
<td>101.8 (13.99)</td>
<td>108.9 (15.28)</td>
</tr>
<tr>
<td>Girls: Boys</td>
<td>0.36</td>
<td>0.32</td>
</tr>
<tr>
<td>Autism Severity²</td>
<td>1.78 (1.52)</td>
<td>6.08 (2.48)</td>
</tr>
<tr>
<td>Word Reading³</td>
<td>83.45 (9.90)</td>
<td>99.33 (13.16)</td>
</tr>
<tr>
<td>Sentence Reading⁴</td>
<td>79.65 (11.54)</td>
<td>100.04 (15.82)</td>
</tr>
<tr>
<td>Language⁵</td>
<td>92.47 (21.07)</td>
<td>94.21 (18.87)</td>
</tr>
</tbody>
</table>

Notes:
1. Standard KBIT Non-verbal IQ
2. Calibrated Severity Score (1-10) (Gotham et al., 2009; Hus & Lord, 2014)
3. Average of the standard scores of 4 reading tests from TOWRE and WRMT
4. Standard score of sentence reading fluency from WJIII
5. Core language score of CELF-4
6. Averaged Z-normed scores of standard scores of four CTOPP subtests (Blending words; Elision; Memory for Digits and Non-word repetition) and the raw score of CNRep.

COMMON ANATOMICAL ALTERATION

Left Arcuate Fasciculus (AF)
- TD vs. Poor Readers
- TD vs. ASD

Right Inferior Longitudinal Fasciculus (ILF)
- TD vs. Poor Readers
- TD vs. ASD

COMMON FUNCTIONAL ALTERATION

Non-word Repetition Task
- Within TD
- TD vs. Poor Readers
- TD vs. ASD

Psychophysiological Interaction (PPI) seed: left STG
- Within TD
- TD vs. Poor Readers
- TD vs. ASD

CONCLUSION

- Phonological deficits are transdiagnostically associated with shared structural and functional neural abnormalities in ASD and Poor Readers.
- Left dorsal route and right ventral route play important roles in the development of phonological working memory.