Introduction

- Schizophrenia patients exhibit impaired working and episodic memory that relates to functioning and prognosis.
- The heritability of memory function suggests that these impairments may have a genetic basis.
- There is strong evidence for impaired performance as a group but less is known about individual patterns and profiles of memory dysfunction.
- The relationship of deficits in schizophrenia to the distribution of performance across memory subsystems in controls and other psychiatric disorders is unclear.

Objectives:

- Use a large normative sample to clarify the distribution and typical structure of different domains and modalities of memory function.
- Test whether deficits in the patient sample reflect generalized impairment affecting all patients across all memory modalities, a specific neurocognitive subtype or domain-specific subtypes.
- Evaluate whether memory deficits associated with schizophrenia represent risk processes shared with other diagnostic syndromes or across complex illnesses.

Study Design

Clinical evaluation

- SCID-IV, symptom ratings
- Neurocognitive testing: CVLT, WMS-IV, Color Trails
- Memory measures:
  - Remember-Know: Scene Recognition;
  - Verbal and Spatial Memory: Capacity, Maintenance and Manipulation

Distribution and Consistency of Impairments

- Distribution of Cognitive Performance by Group
- Distribution of Consistency of Impairments

Density plots of the distribution of memory performance for each group. Performance on each task was scaled (Mean=0, SD=1) across all participants and distributions are represented as Z scores.

Table 1: First Principal Component loadings for each measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>PC1</th>
<th>PC2</th>
<th>PC3</th>
<th>PC4</th>
<th>PC5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Trails II</td>
<td>0.65</td>
<td>-0.56</td>
<td>0.34</td>
<td>0.24</td>
<td>0.20</td>
</tr>
<tr>
<td>Color Trails I</td>
<td>-0.63</td>
<td>0.52</td>
<td>-0.37</td>
<td>0.45</td>
<td>0.19</td>
</tr>
<tr>
<td>Color Trails</td>
<td>0.55</td>
<td>-0.43</td>
<td>0.36</td>
<td>0.42</td>
<td>0.20</td>
</tr>
<tr>
<td>Spatial Memory</td>
<td>-0.62</td>
<td>0.52</td>
<td>0.36</td>
<td>0.45</td>
<td>-0.19</td>
</tr>
<tr>
<td>Verbal Memory</td>
<td>0.64</td>
<td>-0.44</td>
<td>0.43</td>
<td>0.36</td>
<td>0.18</td>
</tr>
<tr>
<td>Symbol Span</td>
<td>0.55</td>
<td>-0.42</td>
<td>0.36</td>
<td>0.43</td>
<td>0.20</td>
</tr>
<tr>
<td>Verbal Manipulation</td>
<td>-0.61</td>
<td>0.53</td>
<td>0.37</td>
<td>0.44</td>
<td>-0.19</td>
</tr>
<tr>
<td>Visual Rep. 1</td>
<td>0.58</td>
<td>-0.43</td>
<td>0.36</td>
<td>0.43</td>
<td>0.19</td>
</tr>
<tr>
<td>Visual Rep. II</td>
<td>0.48</td>
<td>-0.36</td>
<td>0.30</td>
<td>0.36</td>
<td>0.20</td>
</tr>
</tbody>
</table>

The first principal component shows significant group differences in SCZ and controlling for this factor accounts for nearly all group differences across the different measures.

Epidemiological Factors of Memory Performance

- There are consistent, moderate to large impairments across memory measures in SCZ. However, cognitive performance falls within the range of the normal distribution and thus does not strongly differentiate patients from controls or other psychiatric groups.
- BP shows some more moderate cognitive impairments but are overall more similar to controls or other psychiatric groups.

Symptoms Effects

- Across patient samples there is a significant correlation between symptom severity and worse cognitive performance (ranging from .20 to .40 and p < .01 in uncorrected rank and .26 and p < .01 in uncorrected rank). This relationship remains significant within SCZ, BP, and ADHD.

Follow Conclusions

- These results suggest that efforts to determine the pathophysiology of memory deficits in schizophrenia may be less fruitful when targeting underlying factors that contribute to the full distribution and across all domains of memory performance.
- The large control sample size allows for characterization of the full distribution and shows that patients fall within the distribution despite impairments. Future research should include larger patient groups in order to fully characterize their distribution.