Comparing the Cognitive Screening Tools MMSE and SLUMS

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MMSE and SLUMS as Measures of Cognitive Impairment

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Mini–Mental State Examination (MMSE)
- One of the most widely used neuropsychology tests and dementia screening tool.
- Many practitioners have used MMSE scores to recommend treatment options, but are unsure how SLUMS scores compare to those well-known cut-off scores.
Introduction

- Limitations of MMSE
  - Rigid reliance on specific cut-off scores can lead to errors in diagnosis
  - Patients with higher MMSE scores can show significant cognitive impairment when given more sensitive tests
Introduction

- Saint Louis University Mental Status (SLUMS)
  - Better tests for aphasia
  - Five items to remember instead of three (MMSE)
  - Clock drawing already built-in
  - Psychometrically superior
Introduction

- Cognitive Reserve
  - May cover up neuropathophysiology of dementia

- 3 patients scored 30 at time of diagnosis; 5 patients able to score 30 on follow-up administration.
- 5 of the 27 patients scored 27 or higher with diagnosis of mild AD.
- “Normal functioning” scores on MMSE were seen with lower scores on many other assessment tools used in this study.
- Found patients with more mild AD (MMSE ≥ 21) responded better than those with severe AD in terms of language, IADLs (e.g., using telephone)

Raji, Tang, Heyn, Kuo, Owen, Singh, & Ottenbacher (2005):
- Mental status screening using SLUMS detected 60% more cases of mild cognitive impairment when compared to MMSE.
- Significant correlations found between MMSE and SLUMS.
Objective

- **Establish norms** to provide practitioners with a direct method of converting and comparing MMSE and SLUMS scores.
- **Cognitive reserve**, defined as years of education, would show a difference between MMSE and SLUMS scores.
Methods

- Collected data from variety of independent and non-independent living environments.
- Total of 118 participants with an average age of 80.03 (SD=8.71).
- Participants had an average educational attainment of 14.97 years (SD=2.68).
- Each participant was given both the MMSE and SLUMS.
  - Test order counterbalanced to minimize testing bias.
Results

All Participants

Score On Test

- MMSE
- SLUMS

Test
Comparison of Top and Bottom Quartiles of Educational Attainment

Results

Educational Attainment

Difference Scores (MMSE-SLUMS)
Results

Mean Difference in Test Score by Living Environment

Test Score Difference

Independent living

Assisted living

Living Environment
## Results

Average MMSE and SLUMS scores as a function of living environment

<table>
<thead>
<tr>
<th>Living Environment</th>
<th>MMSE</th>
<th>SLUMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assisted Living</td>
<td>23.55</td>
<td>15.32</td>
</tr>
<tr>
<td>Independent Living</td>
<td>28.03</td>
<td>24.41</td>
</tr>
<tr>
<td>Skilled Nursing</td>
<td>29.00</td>
<td>24.00</td>
</tr>
<tr>
<td>Other</td>
<td>29.00</td>
<td>23.50</td>
</tr>
</tbody>
</table>
Conclusions & Implications

- It may be SLUMS is more sensitive at detecting cognitive impairments when people are in mild cognitive impairment range.
- We did not find evidence to support our cognitive reserve hypothesis.
- Practitioners can now convert SLUMS and MMSE scores with our observation that there is an average difference of 4.56
  - SLUMS is lower score.
Limitations

- Education levels may be higher than average.
- A more representative sample of relevant demographic variables is needed.
- There may have been a selection bias in the type of people who volunteered for this study.
