INTRO

• The Spanish-language NIH Toolbox Cognition Battery (NIHTB-CB) is a tablet-assisted neuropsychological test battery with a Spanish-speaking U.S. normative sample, providing a resource for evaluating Spanish-speaking patients (Gershon et al., 2013, 2020).
• Multivariate base rates quantify the normal frequency of low scores on a cognitive test battery, with prior research among mostly English-speaking samples demonstrating that low scores are commonly obtained by healthy people and related to IQ and education (Brooks et al., 2013).
• The current study involved the preparation of multivariate base rates for the Spanish-language NIHTB-CB, quantifying the normal frequency of low age- and demographic-adjusted fluid cognition scores among healthy Spanish-speaking Latinx adults.
• The normative sample has rich sociocultural diversity in terms of national heritage, educational background (e.g., years and country), languages spoken, and socioeconomic status—all of which were hypothesized to relate to the frequency of low scores (Arentoft et al., 2015; Casaletto et al., 2016, Flores et al., 2017).

METHODS

Participants (N=250)

• Spanish-language NIH Toolbox Normative Sample (Gershon, 2016).

Demographic Characteristic

<table>
<thead>
<tr>
<th>Description</th>
<th>Male</th>
<th>N (%)</th>
<th>Female</th>
<th>N (%)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, M (SD)</td>
<td>38.81 (7.7), range: 19 to 80</td>
<td>134 (53.6)</td>
<td>116 (46.4)</td>
<td>0.274</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Men</td>
<td>70 (28.0)</td>
<td>Women</td>
<td>180 (72.0)</td>
<td></td>
</tr>
<tr>
<td>Education (yr), M (SD)</td>
<td>11.5 (3.9), range: 0 to 20</td>
<td>113 (45.2)</td>
<td>137 (54.8)</td>
<td>0.338</td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td>English</td>
<td>192 (76.8)</td>
<td>Spanish</td>
<td>58 (23.2)</td>
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</tbody>
</table>

Measures

• Participants completed the Spanish-language NIH Toolbox Cognition Battery, including:
  • 2 Crystallized Tests: Picture Vocab, Oral Reading Recognition
  • 5 Fluid Tests: Dimension Change Card Sort, Flanker, List Sorting Working Memory, Pattern Comparison Processing, Picture Sequence Memory
• 2 Low memory-related scores are concerning, but this profile (1 score ≤ 9th percentile; 2 scores ≤ 16th percentile) is not unusually low among people with similar sociocultural characteristics

Statistical Analyses

• Scores were normed as age-adjusted and demographic-adjusted scores (i.e., age, gender, education) (Casaletto et al., 2016).
• The frequencies of low fluid scores (e.g., ≤ 16th percentile) were calculated for the full sample with stratifications by education, crystallized ability, and sociocultural variables (i.e., country of origin and education, bilingualism, household income).

RESULTS

• It was common to have had 1 or more low scores.
• There was a significant increase in the frequency of low scores with education and higher verbal IQ.
• Sociocultural stratifications demonstrated a higher odds ratio (OR) of obtaining 1+ low scores among those who were:
  • Born abroad (p=0.002, OR=2.89)
  • Educated abroad (p=0.001, OR=2.47)
  • Monolingual (p=0.009, OR=2.30)
  • From lower income homes (p=0.001, OR=9.19)

DISCUSSION

• Consistent with prior research, low scores were common and increased with fewer years of education and lower verbal IQ.
• A new insight from these findings was the association between sociocultural variables, bilingualism, and acculturation.
• Considering sociocultural variables in cognitive assessment may reduce risk of misdiagnosis when assessing patients with diverse acculturative experiences.

There is a higher risk of misdiagnosing cognitive impairment among Spanish-speaking Latinx adults who were born abroad, educated abroad, and from lower income households.

Healthy adults commonly obtain one or more low scores on cognitive testing when compared to people similar to them in age, gender, and education.

Figure 1. Percentage of Spanish-speaking adults with one or more low fluid cognitive test scores (i.e., ≤ 16th percentile) stratified by verbal IQ and education.

Figure 2. Percentage of Spanish-speaking adults with one or more low fluid cognitive test scores (i.e., ≤ 16th percentile) stratified by sociocultural variables

Figure 3. Select demographic and sociocultural variables related to cognitive test performances

RECOMMENDATIONS

• Considering sociocultural variables in cognitive assessment may reduce risk of misdiagnosis when assessing patients with diverse acculturative experiences.

REFERENCES