Phonotactic Probability and the Peabody Picture Vocabulary Test-3
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How do we evaluate word learning?
- Standardized tests as predictors of word learning abilities
- Not always sensitive to differences
- Examine products vs. processes (e.g., Dollaghan & Campbell, 1998)

Hypothesis
- The utility of standardized vocabulary tests may be improved if the items on the test reflected factors that have been shown to influence the word learning process (i.e., phonotactic probability)

Phonotactic Probability
- Likelihood of occurrence of a sound sequence
  - common (e.g., ‘coat’) vs. rare (e.g., ‘watch’)
- Effects on word learning
  - common learned faster than rare (Storkel, 2001, in press; Storkel & Rogers, 2000)

Questions
- Does the Peabody Picture Vocabulary Test-3 (PPVT-3, Dunn & Dunn, 1997) include a sufficient sampling of common & rare words?
- Do children show evidence of having learned more common than rare words on the PPVT-3, paralleling findings from previous empirical studies?
- Does performance on common versus rare words on the PPVT-3 accurately predict performance in a word learning task?

Methods
- Calculate phonotactic probability for each test item
- Positional segment frequency = \[ \sum \log \text{frequency of words with target sound in target position} \]
- \[ \times \] big frequency of words with any sound in target position
- Test items placed in categories of common and rare using median-split

Results
- Correlation Analysis
  - Correlation with phonotactic probability

<table>
<thead>
<tr>
<th>Word Length</th>
<th>PPVT-3A</th>
<th>PPVT-3B</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30 **</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>Word Frequency</td>
<td>0.05</td>
<td>0.10</td>
</tr>
<tr>
<td>Rated Familiarity</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>Test Item #</td>
<td>-0.00</td>
<td>-0.10</td>
</tr>
</tbody>
</table>

Chi-square test
- Significant effect of phonotactic probability
- No significant effect of phonotactic probability

Follow-up test
- Percentage correct for common & rare test items
- Overall PPVT-3 score?

Do children show common advantage on PPVT-3?

Methods
- Data from 102 preschool children (n=19 with phonological delay)
- Percentage correct for common & rare test items determined for each child
- Overall PPVT-3 score?

ANOVA
- 2 phonotactic probability (common vs. rare) x 2 test (3A vs. 3B)
- No significant main effects of phonotactic probability or test
- Significant interaction: phonotactic probability x test

Follow-up t-test
- Percentage correct for common & rare test items
- Overall PPVT-3 score?

What is the best predictor of actual word learning?

Methods
- Overall PPVT-3 score?
- % Common test items correct?
- % Rare test items correct?

Regression Analysis
- Outcome variable: picture naming accuracy at 1-week post
- Potential predictors
  - Overall PPVT-3 score
  - % Common test items correct
  - % Rare test items correct

Conclusion
- PPVT-3 does sample both common and rare items
- Difficult to isolate phonotactic probability from other variables
- Phonotactic probability subscale scores showed promise in predicting actual word learning
- Accurate prediction of word learning remained problematic
- Further investigation warranted
- Manipulate phonotactic probability of the items

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References