Introduction

- Vocabulary knowledge is important for language and literacy development and overall academic success, but processes that underlie individual differences in word learning abilities are not well understood.
- One hypothesis is that phonological working memory, as measured by nonword repetition, places limits on word learning performance.
- Other evidence suggests that existing vocabulary knowledge, as well as semantic processing skills, influence word learning (see review by Adlof & Perfetti, 2013; McGregor et al., 2002; Sheng & McGregor, 2010).

Method

- A new word involves forming a new phonological representation, a new semantic representation, and bidirectional links between them (Gupta & Tzirdas, 2009).
- Few word-learning studies have measured each of these components of word learning simultaneously.
- The purpose of this study was to examine the relationship between nonword repetition, existing vocabulary knowledge, and word learning abilities in children, and to answer the following questions:

1. Do nonword repetition and existing vocabulary knowledge each explain unique variance in measures of children's word learning?
2. If so, does the amount of variance accounted for by nonword repetition and/or existing vocabulary knowledge depend on the component of word learning measured (i.e., form, meaning, or links)?

Participants

31 children aged 5 to 12 (19 males and 12 females)

Descriptive Statistics

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronological Age</td>
<td>95.58</td>
<td>2.67</td>
</tr>
<tr>
<td>Comprehensive Test of Phonological Processing</td>
<td>87.8</td>
<td>2.67</td>
</tr>
<tr>
<td>Peabody Picture Vocabulary Test, Fourth Edition</td>
<td>105.9</td>
<td>11.80</td>
</tr>
<tr>
<td>Expressive Vocabulary Test, Second Edition</td>
<td>105.28</td>
<td>11.88</td>
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</tbody>
</table>

Stimuli

Novel words
- Six-syllable, CVCCVC pseudowords
- Medium phonotactic probability and neighborhood density (Vaden et al., 2009)

Novel objects
- Six unfamiliar items from familiar categories (e.g., birds, trees)
- Norms for familiarity of items and categories obtained from a separate group of children.

Training

- Children were asked to help an astronaut learn new “alien” vocabulary words.
- Novel names for novel object referents were presented within a computerized script that played three times.
- The order of script elements was changed in the second and third presentations to encourage attention.
- Within the computerized training session, children received 21 exposures to the spoken word form, with the picture of the target object displayed continuously.
- Children also had three opportunities to practice saying the name of each object, and three opportunities to identify the correct object from an array of multiple choices.

Preliminary Results

Boxplots: Word Learning Measures

- Variance in word learning measures explained by age, nonword repetition, and existing vocabulary knowledge.
- Boxplots showing the distribution of scores for naming, listening, describing, and finding.

Correlations

- Significant correlations between nonword repetition and vocabulary knowledge.
- Phonological working memory (nonword repetition) significantly correlates with vocabulary knowledge.

Summary and Discussion

- Together, age, vocabulary knowledge, and nonword repetition explained 56-67% of the total variance in children’s performance on the five measures of word learning.
- Nonword repetition contributed significant unique variance to the prediction of naming and listening performance after controlling for age and existing vocabulary knowledge.
- Existing vocabulary knowledge contributed significant unique variance to the prediction of reading and describing performance after controlling for age and nonword repetition.
- These results indicate that phonological memory and existing vocabulary knowledge each play an important role in word learning, but their relative influence depends on the aspect of word knowledge that is assessed.

Future Directions

- The current sample size is small, thus results should be interpreted with caution. We are continuing to collect data from additional participants.
- We are also examining whether children from language and reading impairment subgroups (SLI, dyslexia, both) show different patterns of performance on these and other word learning tasks.

References


Acknowledgments

We are grateful for the participation of all children in the study. We also thank the members of the SCROLL Lab who assisted with stimulus development, data collection, and data processing: Stephanie Adams, Alex Catron, Leah Hunt, Lauren Judy, Elaine Miller, Allison Randell, Carole Smith, Sheneda White. This research is supported, in part by a grant from the USC Vice Provost for Research to S. Adlof, A Magellan Scholar Award to Hannah Patten, and a grant from the National Institutes of Health (F30HD051399) to S. Adlof.