

Semantic Density in Word Learning: A Preliminary Report

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Types of Representations

- Phonological: individual sounds (e.g., /f/, /i/, /t/)
- Lexical: whole-word form (e.g., /fish/)
- Semantic: meaning or referent

Word Learning

- Hear a novel word paired with a novel object
- Activate existing phonological representations (e.g., /f/ /i/ /t/)
- Activate existing lexical representations (e.g., /fish/, /flip/) but no exact match
  - Formation of new lexical representation triggered (i.e., word learning)
  - Number of existing lexical representations, namely lexical density, influences learning by children and adults (Storkel, 2001, 2004; Storkel, Armbruster, & Hogan, 2006; Storkel & Rogers, 2000)
- Many lexical neighbors > few lexical neighbors
- Activate existing semantic representations (e.g., trumpet, horn) but no exact match
- Formation of new semantic representation triggered (i.e., word learning)
- Does the number of existing semantic representations, namely semantic density, influence learning?

Purpose

- Study 1: Determine semantic neighbors for a set of novel objects
- Study 2: Compare learning of novel objects with many versus few semantic neighbors

Study 1

- Participants: 82 adults (M = 19 years; SD = 1.3 years) & 92 preschool children (M = 4; 8; SD = 0; 7)
- Stimuli: Nonobjects developed by Kroll & Potter (1984)
- Procedure: Discrete association task
  - Show picture → Report first word that comes to mind
  - Responses reported by 2+ participants in the same group (adult vs. child) = semantic neighbor for that group
- Results: Similarity between adult and child semantic neighbors
  - Adult semantic density positively correlated with child semantic density, r (1, 47) = 0.33, p < 0.05, r² = 0.11
  - No significant difference in number of semantic neighbors reported by adults or children, t (1, 46) = 0.61, p > 0.50
  - 30% of child semantic neighbors also were adult semantic neighbors but variability across neighbors
- Semantic neighbors reported by 4 or fewer children rarely were reported by adults as semantic neighbors
- Semantic neighbors reported by 5 or more children frequently were reported by adults as semantic neighbors

Study 2

- Participants: 18 adults (M = 22 years); 36 preschool children (M = 4; 8; SD = 0; 7)
- Stimuli:

<table>
<thead>
<tr>
<th>Few Semantic Neighbors (i.e., 10th-25th percentile)</th>
<th>Many Semantic Neighbors (i.e., 50th-75th percentile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonobject</td>
<td>Objectlikeness Rating</td>
</tr>
<tr>
<td>(21)</td>
<td>4.6</td>
</tr>
<tr>
<td>(75)</td>
<td>3.3</td>
</tr>
<tr>
<td>(48)</td>
<td>3.1</td>
</tr>
<tr>
<td>(68)</td>
<td>3.2</td>
</tr>
<tr>
<td>(79)</td>
<td>3.6</td>
</tr>
<tr>
<td>M</td>
<td>3.6</td>
</tr>
<tr>
<td>SD</td>
<td>0.6</td>
</tr>
</tbody>
</table>

- Objectlikeness ratings are from Kroll & Potter (1984).
  - Rating of 1 = “looked very much like a real object.” Rating of 7 = “looked nothing like a real object.”

- Measures of learning: Picture naming and referent identification
  - Procedure:
    - Exposure: Nonobject-nonword pairs presented in a game format
    - Measures of learning: Picture naming and referent identification
  - Results: No significant effects for adults yet (power) but significant interactions for children

Summary and Conclusions

- Similarity to existing representations influences word learning, regardless of whether similarity involves lexical or semantic representations
- Direction of effect of similarity varies by type of representation
  - Many lexical neighbors facilitates learning
  - Many semantic neighbors impedes learning
- Similarity influences retention
  - More research needed for influence during immediate learning

References


