Concerning Initial and Final Consonant Sequences.

Angeles. [3]

Many thanks to Kie Kuraw, Megha Sundara, Robert Daland, and Bruce Hayes for their guidance and advice and to the UCLA Phonology Seminar audience.

References


Background

• What role does **substantive bias** play in phonological learning and in shaping the phonological typology?
  ➢ Substantive (a.k.a. naturalness) bias: learning bias against phonetically unnatural patterns
  ➢ Evidence for substantive bias is mixed and has focused on alternations (Moreton & Pater 2012)

• **Research question:** Does phonetic naturalness bias phonotactic learning?
• **Approach:** Test whether learners reproduce a phonetically-motivated phonotactic implicational in an artificial grammar learning experiment
• **The implicational:** Word-final major place contrasts (e.g. /pa/ vs. /ta/ vs. /ka/) → word-initial major place contrasts (e.g. /pa/ vs. /ta/ vs. /ka/), but not necessarily vice versa (Steriade 1994, 2001)

Method

• Expose subjects to 3-way place contrast word-initially or word-finally and test whether they extend contrast to other position
• Two training conditions, WordInitialContrast (WIC) and WordFinalContrast (WFC)

<table>
<thead>
<tr>
<th>#P</th>
<th>#T</th>
<th>#K</th>
<th>P#</th>
<th>T#</th>
<th>K#</th>
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<tr>
<td>WIC</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>WFC</td>
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<td>✓</td>
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• 40 training items, 2 blocks of training (with images)
• 48 test items (same for all conditions): #P, #T, #K, P#, T#, and K# items (no images)
• Task: Say whether each word could also be a word of the language heard in training (Yes/No)
• 3 types of test item:
  ➢ **Familiar Conforming:** place of articulation and position conform to trained pattern, and item heard in training (e.g. *pinir* in WordInitialContrast)
  ➢ **Novel Conforming:** place of articulation and position conform to trained pattern, but item not heard in training (e.g. *pasíl* in WordInitialContrast)
  ➢ **Novel Nonconforming:** place of articulation and position combination not heard in training (e.g. *nąlúp* for WordInitialContrast)

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<tbody>
<tr>
<td>pinir</td>
<td>tlinir</td>
<td>kiniir</td>
<td>jàwít</td>
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<td>bunił</td>
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<td>gírił</td>
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Predictions

• Acceptance rates of Novel Nonconforming items (relative to Novel Conforming items) indicate whether subjects have extended place contrast to a new position in a given condition
• Bias toward phonetically natural systems → WFC subjects will accept Novel Nonconforming items more than WIC subjects (more extension of place contrast from word-final to word-initial position than vice versa)
• No bias toward phonetically natural systems → similar acceptance rates of Novel Nonconforming items in WIC and WFC since two training patterns of equal formal complexity

Acknowledgments

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Experiments 1 and 2: Place Contrasts

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<tr>
<th>Exp. 1: Acceptance Rates of Test Items by Condition</th>
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<tbody>
<tr>
<td><img src="image1.png" alt="Acceptance Rates" /></td>
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</table>

- **Acceptance Rates**
  - **Familiar Conforming > Novel Conforming**
  - **Novel Conforming > Novel Nonconforming**
  - **Novel Conforming:** significantly above chance
  - Subjects correctly generalized to new words in their language
  - **Novel Nonconforming:** significantly below chance
  - Subjects correctly rejected words not in their language
  - No interactions → equal learning of natural and unnatural patterns

Experiment 3: Onset Complexity

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<th>Acceptance Rates of Test Items by Condition</th>
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<td><img src="image2.png" alt="Acceptance Rates" /></td>
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</table>

- **Design**
  - Phonotactic implicational: Complex onsets → simple onsets, but not vice versa (Greenberg 1965)
  - Design analogous to place contrast experiments
  - Two conditions: Complex Onsets (CC) and Simple Onsets (OC)
  - 18 training items (CCVC or CVC nonce words), 2 blocks
  - 18 test items (4 Familiar Conforming, 5 Novel Conforming, 9 Novel Nonconforming)

- **Acceptance Rates**
  - **Familiar Conforming > Novel Conforming**
  - **Novel Conforming > Novel Nonconforming**
  - **No interactions:** complex onset-only and simple onset-only languages learned equally well

Conclusion

- Phonotactic implicational: Place contrasts only word-initially and place contrasts only word-finally equally learnable
- Complex onsets only and simple onsets equally learnable
- **No evidence for substantive bias,** in line with Moreton & Pater 2012
- If phonetic naturalness does not bias phonotactic learning, what accounts for asymmetries in the typology?
- Given elusiveness of substantive bias effects, a diachronic/channel bias account grows more appealing