Background

A Typological Asymmetry
- Final devoicing is prevalent, but final voicing is virtually unattested (Yu 2004)

Forces Hypothesized to Shape the Phonological Typology:
- **Analytic bias** (synchronic):
  - Substantive (a.k.a. naturalness) bias: bias against phonetically unnatural patterns (Wilson 2006)
  - Final devoicing facilitates articulatory ease (Westbury & Keating 1986) → more natural than final voicing
  - Complexity bias: against formally complex patterns (Moreton 2008)
  - Complexity bias well-supported; evidence for substantive bias weak (Moreton & Pater 2012)
- **Channel bias** (diachronic): Phonetic factors’ influence on language transmission makes some processes (e.g. final devoicing) more likely to arise diachronically than others (e.g. final voicing) (Ohala 1993)

Research Question: Is the substantive bias hypothesis correct?

An Artificial Grammar Learning (AGL) Study
- We tested learnability of 3 patterns: Final Devoicing, Final Voicing, and Exchange (final devoicing and voicing)
- Substantive bias predicts Devoicing should be learned better than Voicing
- Complexity bias predicts Exchange should be learned worse than Devoicing and Voicing

Method

- Subjects trained on a plural-singular alternating, then asked to choose correct singular given plural

Sample Training Items by Condition and Stem Type

<table>
<thead>
<tr>
<th>Condition</th>
<th>Sonorant-Final Stem</th>
<th>Voiced-Final Stem</th>
<th>Voiceless-Final Stem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devoicing</td>
<td>komá̄l-ĩ ~ komá̄l</td>
<td>mulb-ĩ ~ mulb</td>
<td>tulź̄-ă ~ tulź̄</td>
</tr>
<tr>
<td>Voicing</td>
<td>komá̄l-ĩ ~ komá̄l</td>
<td>mulb-ĩ ~ mulb</td>
<td>tulź̄-ă ~ tulź̄</td>
</tr>
<tr>
<td>Exchange</td>
<td>komá̄l-ĩ ~ komá̄l</td>
<td>mulb-ĩ ~ mulb</td>
<td>tulź̄-ă ~ tulź̄</td>
</tr>
</tbody>
</table>

- Training: 36 plural-singular pairs, 12 of each stem type
- Test: 36 plural-singular pairs, 12 of each stem type (6 familiar, 6 novel)
  - Plural form given → choose alternating (obstructant: different voicing; sonorant: r ← l, m ← n) or non-alternating singular form

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Selected References