The effect of language proficiency on patterns of epenthesis by Persian learners of English

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1. Background

Asymmetries in epenthesis

Illicit complex onsets are often repaired by *epenthesis* (Hall 2011).

Placement of epenthetic vowel differs based on onset type.

In Persian, /s/-stop, /s/- liquids, and /s/-nasal clusters are repaired with prothesis, and everything else with anaptyxis.

Are /s/-initial clusters different?

/s/-initial clusters also differ from obstruct + sonorant (OR) clusters in terms of their:

Articulation

/s/-initial clusters have greater degrees of gestural overlap and stricter timing patterns than OR clusters (Pouplier et al. 2022).

Acquisition

Relative to OR clusters, /s/-initial clusters are:
- Acquired later in L1 acquisition (Geirut 1999)
- Repaired more frequently in L2 (Carlisle 2001)

Perception

Epenthesis within an /s/-initial cluster is more perceptually disruptive than within OR clusters (Fleischhacker 2001).

Open questions

Do L2 learners acquire /s/-initial onsets more slowly than other types of onsets?

What can this tell us about the status of these onsets?

2. Experimental study

Hypotheses

1. /s/-initial onsets are repaired with prothesis, others with anaptyxis.
2. /s/-initial onsets undergo more epenthesis than other types.
3. Higher English proficiency corresponds to less epenthesis.
4. Learners improve more slowly at /s/-initial clusters.

Participants

19 native Farsi speakers (14M, 36-80 y.o.)

Experiment

1. Produced 74 English words with complex onsets.
2. English ability assessed with LEAP-Q.

Analysis

Mixed-effects multinomial logistic regression model predicting epenthesis type (none, prothesis, anaptyxis) from (among others):

1. Onset sonority $\Delta$
2. Onset identity
3. Relative English Dominance (RED)

Random intercepts for participant and word.

Results

Learners improve more slowly at /s/-stop clusters.

Mixed-effects multinomial logistic regression model predicting epenthesis type (none, prothesis, anaptyxis) from (among others):

1. Onset sonority $\Delta$
2. Onset identity
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Random intercepts for participant and word.

3. Phonological modeling

Analyzed using MaxEnt OT (Goldwater & Johnson 2003)

Key constraints (Fleischhacker 2001)

1. *COMPLEX: Don’t have complex onsets.

Model comparison

<table>
<thead>
<tr>
<th>Model</th>
<th>LogLik</th>
<th>Weights</th>
<th>BIC</th>
<th>Parameters</th>
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<tr>
<td>*Complex, $\rho$</td>
<td>-759</td>
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<td>*Complex = 2.31 $\rho = 0.5$</td>
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<td>*Complex-(S, T), $\rho$</td>
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<td>*Complex-S = 20.75 $\rho = 0.5$</td>
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<td>*Complex-S = 20.75 $\rho_S = 0.4$ $\rho_T = 0.6$</td>
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4. Discussion

/s/-initial clusters are repaired more frequently and acquired more slowly by Persian speakers than other types of clusters.

Why are /s/-initial clusters hard?

Perceptual cost of anaptyxis into an /s/-initial cluster is high compared to OR clusters (Fleischhacker 2001).

Greater timing coordination required to generate desired outcome? (e.g. Pouplier et al. 2022)

/s/-initial clusters differ from obstruent + sonorant (OR) clusters in terms of their:

Perception

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