Stem-Syllable Alignment in Nobiin

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Overview

- **Observation:** Liquids [l] and [r] are variably epenthesized before V-initial morphemes in Nobiin. These epenthetic consonants ('EC') either resolve vowel hiatus (V_V) or result in an apparently phonologically non-optimal surface consonant cluster (C#_V).

  (1) mug-(r-)anní (l-)aʃrij-a
  dog-(EC-)1SG.POSS (EC-)beautiful-PRED
  'The dog is beautiful.'

  - Epenthesis of [l] can only occur at the left boundary of the VP.
  - Epenthesis of [r] can only occur within the NP.
- **Proposal:** Segmentally non-optimizing epenthesis creates prosodically optimal alignment between prosodic boundaries and syllable boundaries.

Background

Nobiin (ISO 639-3, fia)

- Northern Eastern Sudanic, Nilo-Saharan
- Native to southern Egypt and northern Sudan
  - Speakers have been displaced because of geopolitical circumstances.
- 669,000 speakers
  - Over half of speakers are outside of Nubia.
- Endangered and under-documented

Nobiin phonology & word order

- Contrastive geminates and long vowels
- H vs. L tones
- Heterosyllabic consonant clusters
  - /nab.ra/, /aʃ.rij/, /mak.ʃe/, /dir.bad/
- Liquids
  - Neither found underlyingly in word-initial position
  - /r/ surfaces as tap or trill
- S | OV word order, with adverbs permitted anywhere in VP

Data Collection

- Data collected from 1 speaker
  - Northern Sikod region
- Elicitations
  - Recorded in the US over the last 18 months
  - Translation of English sentences
  - Different speech rates elicited

The Data

Epenthesis of [l] in the VP

- [l] is epenthesized at the left edge of the verbal domain.

  (2) a. Nobanto:d l-ukkel
  Nubantood EC-listen.1SG.NPST
  'Nubantood listens.'
  b. Nabra l-urti-g dollidʒin
  Nabra EC-animal-ACC love.3SG.NPST
  'Nabra loves animals.'
  c. aj l-isaatta ag garjil
  1SG EC-now PROG read.1SG.NPST
  'I'm reading now.'

- Epenthesis only occurs before vowel-initial elements.
- There is no epenthesis VP-internally.
  - Vowel hiatus is resolved VP-internally by vowel reduction.
  - Vowel reduction at the left boundary of the VP is disallowed.
- Epenthetic [l] is syllabified as the onset on the left edge of the VP.

Epenthesis of [r] in the NP

- [r] is epenthesized between a noun and other NP elements.

  (3) fag-r-olow
  goat-EC-thin
  'the thin goat'

- Differences from [l] epenthesis pattern
  - This epenthesis is not at the left edge of the same type of phrase.
  - Certain nouns do not take [r] epenthesis; these exceptional nouns are not phonologically predictable.
    - [mug-r-anní] 'my dog' but [nog-*r-anní] 'my house'

Other Epenthesis Facts

- Variable
  - No morphosyntactic/semantic contribution
  - Speaker regularly produces sentence with/without epenthesis in identical contexts
- Speech rate/register effects
  - Epenthesis more likely to surface in faster, less careful speech
  - Speaker describes epenthesis use as sign of 'good accent'

Proposal

- ALIGN(φ, L, σ, L): Assign one violation for each phonological phrase whose left edge is not aligned to the left edge of a syllable.
- ALIGN(STEM, R, σ, R): Assign one violation for each morphological stem whose right edge is not aligned to the right edge of a syllable.

Analysis

[l] vs. [r]

- It is assumed that the epenthetic consonant is underlyingly /r/.
  - Epenthetic [r] surfaces in other non-variable environments word-internally in the language.
- The [l] allophone surfaces as the result of a phonological constraint against [r] at the beginning of a phonological phrase.

(4) *[$_\varphi$r: Assign one violation for every instance of [r] that surfaces at the left edge of a phonological phrase.

Weighted Constraints Analysis

- Constraint weights presented in MaxEnt Harmonic Grammar tableau (Goldwater and Johnson, 2003; Wilson, 2006; Hayes et al., 2009)
  - Epenthetic and non-epenthetic forms are analyzed here as surfacing with equal frequency.
- Table 1 shows [l] epenthesis VP-initially; these constraint weights also predict vowel hiatus reduction inside the VP but not VP-initially.

/dirbad aʃrij-a/	ALIGN (φ, L, σ, L)	*[$_\varphi$r	ONSET	DEP	IDENT	MAX	*CC	
	16.8	10.1	7.6	7.2	1.1	0	0	
☞ a. dir.bad.[aʃ.ri.ja]$_\varphi$			1					7.6
☞ b. dir.bad.[**l**aʃ.ri.ja]$_\varphi$				1	1		1	8.3
c. dir.ba.d[aʃ.ri.ja]$_\varphi$	1							16.8
d. dir.bad.[**r**aʃ.ri.ja]$_\varphi$		1		1			1	17.3

Table 1: /l/ Epenthesis and Cluster Formation

- Table 2 shows [r] epenthesis NP-internally.

/mug anní/	ALIGN (STEM, R, σ, R)	*[$_\varphi$r	ONSET	DEP	IDENT	MAX	*CC	
	15.3	10.1	7.6	7.2	1.1	0	0	
☞ a. [mug]$_{\text{STEM}}$.**r**an.ní				1			1	7.2
☞ b. [mug]$_{\text{STEM}}$.an.ní			1					7.6
c. [mug]$_{\text{STEM}}$.**l**an.ní				1	1		1	8.3
d. [mu.g]$_{\text{STEM}}$an.ní	1							15.3

Table 2: /r/ Epenthesis NP-Internally

Discussion

- The present analysis captures 2 variable epenthetic processes with 1 set of weighted constraints.
  - ALIGN constraints lead to attested epenthesis sites.
  - Constraint against φ-initial [r] leads to attested qualities of epenthetic consonant, following other phonological evidence from the language.
- The distribution of epenthetic [l] and [r] could be due to morphosyntactic differences, and not the result of a phonological alternation.
  - [l] is epenthesized at the VP phrase boundary; [r] is epenthesized NP-internally.
    1. Indexed constraints (Beckman, 1995, 1997; Itô and Mester, 1999; Pater, 2000)
    2. Cophonologies by Phase (Sande, 2017)
    3. Match Theory (Selkirk, 2011)

Conclusion

- Segmentally non-optimizing consonant process is actually prosodically optimizing.
  - Consonant epenthesis creates a consonant cluster, but also allows for alignment of phrase boundaries and syllable boundaries.
- Phonological process are always phonologically optimizing in some way.

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