Doubly triggered vowel replacement via cumulative cophonologies

Hannah Sande, Georgetown University

Introduction: Original data from Guébie, an endangered Kru language spoken in Côte d'Ivoire, show that certain root vowels undergo replacement by vowels of particular suffixes: $/\text{jıla}^{3.3}=\text{ɔ}^2/$, *ask*-3SG.ACC → $[\text{jɔlɔ}^{3.2}]$, 'ask him'. This vowel replacement phenomenon is complex in two ways: 1) it is morphosyntactically conditioned in that it only occurs in the presence of a plural suffix or object marker (OM), and 2) it exhibits lexical specificity, in that not all roots undergo vowel replacement. To account for this dual conditioning, I extend the Cophonologies by Phase (CBP) approach (Sande and Jenks, To appear) to crucially allow for cumulative effects of cophonologies within a spell-out domain.

Cophonologies by Phase: CBP is a model of the morphology/phonology interface which introduces an enriched concept of Vocabulary (lexical) entries, where each item is associated with three pieces of content, any of which may be null: 1) Tonal or segmental featural content ($\mathcal{F}$), 2) Prosodic selection or subcategorization ($\mathcal{P}$), and 3) a constraint subranking ($\mathcal{R}$). The constraint subrankings associated with Vocabulary items override the master ranking of a language (Anttila, 2002; Inkelas and Zoll, 2005, 2007) only in the spell-out domain, or phase, containing the relevant Vocabulary item. The master ranking undergoes the minimal changes necessary to comply with the cophonologies triggered in that domain. For the purposes of this talk, the relevant phase domains are D and Voice (Chomsky, 2000, 2001; Marvin, 2002).

Morphosyntactic conditioning: Third-person OMs and plural suffixes in Guébie trigger vowel replacement, or complete vowel harmony, where root vowel features are replaced wholesale by the features of the vowel of the OM, (1). The final vowel of the root fails to surface in the context of a vowel-initial suffix or enclitic, via normal hiatus resolution processes in the language. Tone is marked with numbers 1-4; 4 is high.

(1) **Vowel replacement in the context of object markers**

	Root	Root+3sg.acc	Gloss
a.	$\text{bala}^{3.3}$	$\text{bɔl}=\text{ɔ}^{3.2}$	'hit'
b.	$\text{tulu}^{4.4}$	$\text{tɔl}=\text{ɔ}^{4.2}$	'chase'
c.	$\text{jıla}^{3.3}$	$\text{jɔl}=\text{ɔ}^{3.2}$	'ask'

Other suffixes in Guébie have no effect on root vowels. For example, the passive suffix, $/\text{-ɔ}^2/$, which is phonologically identical to the 3SG human OM, does not condition vowel replacement: $\text{bala-ɔ}^{3.3.2}$, *hit*-PASS → $\text{bal-ɔ}^{3.2}$, 'was hit'.

Lexical specificity: Only a subset of roots undergo vowel replacement, even when in the environment of an OM or plural suffix. Based on a sample of 2,000 Guébie roots, vowel replacement only occurs in 33% of them. Compare the non-alternating roots in (2) to (1).

(2) **Lack of vowel replacement for certain lexical roots**

	Root	Root+3sg.acc	Gloss
a.	$\text{ɟʊla}^{3.2}$	$\text{ɟʊl}=\text{ɔ}^{3.2}$, *$\text{ɟɔl}=\text{ɔ}^{3.2}$	'take, borrow'
b.	$\text{kalalɛ}^{3.2.2}$	$\text{kalal}=\text{ɔ}^{3.2.2.2}$, *$\text{kɔlɔl}=\text{ɔ}^{3.2.2.2}$	'help'

The roots in (2) share a number of phonological traits with those in (1); however, only those in (1) undergo replacement in the context of an OM.

Cumulative Cophonologies: I extend the Cophonologies by Phase model of Sande and Jenks (To appear), to allow for multiple cophonologies to be triggered within a single spell-out domain, with cumulative effects. In the case of vowel replacement, neither the cophonology

associated with an alternating root, nor the OM or plural suffix is enough on its own to trigger vowel replacement. However, when both are present in the same spell-out domain, their effects are strong enough to result in full harmony.

The relevant piece of the default ranking in the language, independently motivated by other alternations, is IDENT-IO(V), IDENT-IO ≫ VHARMONY. Here VHARMONY stands in for a set of constraints requiring full vowel harmony. Harmony-triggering suffixes like the OM are associated with a subranking in their Vocabulary entry.

(3) **Object marking Vocabulary item**

$$[3sg.hum.acc] \longleftrightarrow \begin{cases} \mathcal{F}: & /\mathfrak{z}^2/ \\ \mathcal{P}: & [= X]_\omega \\ \mathcal{R}: & \text{VHARMONY} \gg \text{IDENT-IO} \end{cases}$$

On its own, the reranking of VHARMONY over IDENT-IO is not enough to result harmony, since an IDENT-IO(V) constraint still outranks the constraint requiring harmony. Lexical roots subject to replacement are also associated with a subranking.

(4) **Alternating root Vocabulary item**

$$[\sqrt{}] \longleftrightarrow \begin{cases} \mathcal{F}: & /\text{bala}^{3.3}/ \\ \mathcal{P}: & [X]_\omega \\ \mathcal{R}: & \text{VHARMONY} \gg \text{IDENT-IO(V)} \end{cases}$$

The demotion of IDENT-IO(V) in the context of this specific set of roots is otherwise motivated in the language, since the initial vowel in this same subset of 33% of roots also undergoes optional reduction in all contexts, while other roots do not (Sande, 2017, ch. 5).

When an alternating root and an OM or plural suffix are spelled out within the same DP or VoiceP, their effects accumulate and result in full vowel harmony.

(5) **Cumulative effect of two subrankings**

- Default: IDENT-IO(V), IDENT-IO ≫ VHARMONY
  - Object/plural: VHARMONY ≫ IDENT-IO
  - Alternating roots: VHARMONY ≫ IDENT-IO(V)
- Combined: VHARMONY ≫ IDENT-IO(V), IDENT-IO

Only in a spell-out domain containing both an OM or plural suffix and a root of the alternating class, full vowel harmony will apply.

Implications: The cumulative effect of multiple cophonologies triggered within the same phase, modeled here for Guébie doubly triggered vowel replacement, extends to dually conditioned phonological alternations across languages, for example, velar softening of the final C in certain English roots before *-ity, -ism*, but not before other /ɪ/-initial suffixes (cf. Kiparsky 1982). Additionally, this framework presents a unified model of lexically and morphologically conditioned phonology via cophonologies associated with Vocabulary entries.

Selected References: Sande, Hannah and Peter Jenks. To appear. Cophonologies by Phase. Proceedings of NELS 48.

References

Anttila, Arto. 2002. Morphologically conditioned phonological alternations. Natural Language & Linguistic Theory 20:1–42.

Chomsky, Noam. 2000. Minimalist inquiries: the framework. In Step by step: Essays on minimalist syntax in honor of howard lasnik, ed. Roger Martin, David Michaels, and Juan Uriagereka, 89–155. MIT press: Cambridge, MA.

Chomsky, Noam. 2001. Derivation by phase. In Ken Hale: A life in language, ed. Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.

Inkelas, Sharon, and Cheryl Zoll. 2005. Reduplication: Doubling in morphology, volume 106. Cambridge University Press.

Inkelas, Sharon, and Cheryl Zoll. 2007. Is grammar dependence real? A comparison between cophonological and indexed constraint approaches to morphologically conditioned phonology. Linguistics 45.1:133–171.

Marvin, Tatjana. 2002. Topics in the stress and syntax of words. Doctoral Dissertation, Massachusetts Institute of Technology.

Sande, Hannah. 2017. Distributing morphologically conditioned phonology: Three case studies from Guébie. Doctoral Dissertation, UC Berkeley.

Sande, Hannah, and Peter Jenks. To appear. Cophonologies by phase. NELS 48 Proceedings .