

Height Harmony and Nasal Vowels: An Argument for Agreement by Correspondence

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1. Overview

In the Recifense dialect of Brazilian Portuguese (RBP), pretonic mid vowels harmonize in height with tonic vowels, *unless* the tonic vowel is nasal.

Height harmony in Recifense:

RBP (da Hora & Vogeley 2013) allows all vowels in both tonic and pretonic positions.

	Front	Back	
High	i ī	u ũ	
Mid	e ē	o ô	+ATR
	ɛ	ɔ	-ATR
Low		a ā	

However, pretonic high-mid vowels are subject to distributional restrictions.

In pretonic syllables, high-mid vowels [e o] can only occur as a result of vowel harmony, triggered by a [+ATR] vowel in the tonic syllable:

[m _o . 'tɔh] 'motor'	[p _{eh} . 'dɛh] 'to lose'
[m _{oh} . 'dɛh] 'to bite'	[s _e . 'tɔh] 'sector'
[m _{oh} . 'd _i .du] 'bitten'	[p _{eh} . 'd _i .du] 'lost'

Outside of this harmony context, pretonic high-mid vowels may not occur:

[hɛ. 'vɛh.su] 'reverse'	*[hɛ. 'vɛh.su]
[hɛ. 'dɔh] 'surroundings'	*[hɛ. 'dɔh]
[sɔw. 'tah] 'to let go'	*[sɔw. 'tah]

Nasal vowels and height harmony:

If the tonic vowel is nasal, harmony does not occur:

[pɛh. 'dɛ̃.du] 'losing'	*[pɛh. 'dɛ̃.du]
[mɔh. 'dɔ̃.mu] 'butler'	*[mɔh. 'dɔ̃.mu]
[i.no. 'sɛ̃.ti] 'innocent'	*[i.no. 'sɛ̃.ti]
[hɛ. 'dɔ̃.du] 'round'	*[hɛ. 'dɔ̃.du]

Proposal: Agreement by Correspondence (ABC; Rose & Walker 2004; Rhodes 2012) uniquely explains this pattern.

- ABC constraints only license harmony of sufficiently similar *corresponding* segments.
- Nasal and oral vowels are not similar enough correspond and be compelled to harmonize.
- Alternative accounts of trigger asymmetries relying on the trigger's segmental quality do not generate this attested pattern.

3. Analysis

Background:

ABC relies on two main types of constraints:

CORR-XY constraints require pairs of X- and Y-type output segments sharing feature set F to correspond.

IDENT-XY[F] constraints require segments in correspondence to agree for feature F.

Fixed ranking of **CORR** constraints: constraints regulating correspondence between more similar segment types (sharing more features) are ranked higher.

Constraints:

CORR-EI: [-low, -nasal] (non-low oral) vowels must correspond.

CORR-ĒI: [-low] (non-low vowels, oral or nasal) must correspond.

IDENT-VV[ATR]: Vowels in correspondence must have the same value of [±ATR].

*Ē: No high mid vowels may occur in pretonic position.

Constraint ranking:

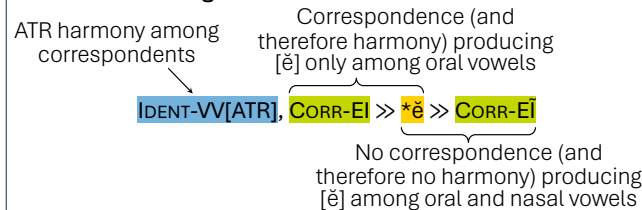


Tableau 1: Oral pretonic and tonic vowels

Input: /pɛhdidu/	IDENT-VV[ATR]	CORR-EI	*Ē	CORR-ĒI
a. [pɛh. 'd _i .du]	*!			
b. [pɛh. 'di.du]		*!		*
c. [pɛh. 'd _i .du]			*	

Tableau 2: Oral pretonic, nasal tonic vowels

Input: /pɛhdēdu/	IDENT-VV[ATR]	CORR-EI	*Ē	CORR-ĒI
a. [pɛh. 'dɛ̃.du]	*!			
b. [pɛh. 'dɛ̃.du]				*
c. [pɛh. 'dɛ̃.du]			*!	

Candidate (a): Correspondence but no harmony

Candidate (b): No correspondence, no harmony

Candidate (c): Correspondence and harmony

4. Alternative Analyses

Outside of ABC, triggering asymmetries are typically motivated by a potential trigger's segmental quality rather than similarity between trigger and target.

Under that approach, there is no way to prevent only nasal vowels from serving as triggers of height harmony in RBP.

'Bad Vowels Spread': many theories of harmony specially promote the spreading of features from perceptually weak vowels (Kaun 1995).

Nasality alters the formant structure of vowels such that height contrasts are more difficult to perceive (Kingston 2007).

In RBP, this suggests that nasal vowels should be *preferred* triggers of height harmony relative to oral vowels, reversing the RBP harmony pattern.

Tableau 3: Oral pretonic and tonic vowels

Input: /pɛhdidu/	SPREAD[+ATR]if[+nasal]	*Ē	SPREAD[+ATR]
a. [pɛh. 'di.du]			*
b. [pɛh. 'di.du]		*	

Tableau 4: Oral pretonic, nasal tonic vowels

Input: /pɛhdēdu/	SPREAD[+ATR]if[+nasal]	*Ē	SPREAD[+ATR]
a. [pɛh. 'dɛ̃.du]	*!		*
b. [pɛh. 'dɛ̃.du]		*	

No ranking of weak-trigger-preferring constraints produces RBP-like harmony pattern.

5. Further Implications

In RBP, the feature [±nasal] determines whether vowels are sufficiently similar to harmonize.

Big question: are all features equally able to determine (dis)similarity with respect to vowel harmony?

Probably: many Bantu languages (e.g. Nyamwezi) exhibit a front/back asymmetry in height harmony (Hyman 1999):

High front vowels lower after all mid vowels

High back vowels lower *only* after mid back vowels

Many rounding harmony systems prefer or are fully restricted to applying *only* among vowels of the same height (Kaun 1995, 2004).