Non-Iterativity and the role of Juncture in Vata ATR Spreading

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Vata (Kru, Ivory Coast) displays root-controlled ATR harmony. Within the domain of a word, harmony is complete — there are no directional restrictions, and no opaque or transparent segments. Across word boundaries, the pattern is strikingly different. Between words, ATR harmony is more restricted: it's optional and directional (1). Harmony across word boundaries is also non-iterative into polysyllabic words (2) but iterative across sequences of monosyllabic words (3).

This non-iterativity is a problem for theories of vowel harmony situated in Optimality Theory (OT, Prince and Smolensky 1993/2004) — as Kaplan (2008) points out, non-iterative processes are not predicted to exist under the fundamental assumptions of OT. Kaplan proposes an account of Vata non-iterativity that brings it into line with OT, but his analysis crucially relies on the Sour Grapes property of the AGREE constraint, which has been shown to be pathological (Wilson, 2006).

In this paper, I propose an account of Vata harmony situated in Harmonic Serialism (HS), a derivational variant of OT with independent typological advantages (McCarthy, 2000, 2007). In HS, candidates may differ from the input by only a single change, and a derivation involves multiple passes through a GEN→EVAL loop. Each single change must improve performance on the language's constraint hierarchy in order to be a possible step in the derivation.

Within this framework, I propose that McCarthy's SHARE(F) constraint should be split into a domain-specific version (4) and a juncture-specific version (5), following discussions of Juncture processes in the rule-based literature (Selkirk, 1980; Nespor and Vogel, 1986) . Like its predecessors in rule-based phonology, the domain-specific constraint here is sensitive to the domain where the feature is docked (rather than applying to all domains of the same type).

When SHARE-D ≫ IDENT, within-word spreading results. Across-word-boundary spreading results when SHARE-J ≫ IDENT. Non-iterativity into polysyllabic words results from a combination of the domain-specificity of SHARE-D and the gradualness of HS. Because we can only spread one link at a time, it is not possible to eliminate any more SHARE-J violations. The form that satisfies all the SHARE-J violations, [o ni sʌkʌ pi] is not a candidate at this step — to get there, we must go through an intermediate step that does improve in SHARE-J, [ɔ nɪ sʌkʌ pi]. Because SHARE-D is specific to the domain where the feature is docked, it does not compel continued spreading into the next domain. Going from [ɔ nɪ sakʌ pi] to [ɔ nɪ sʌkʌ pi] is not harmonically improving.

Into monosyllabic words (7), iteration is possible. Because the junctures are adjacent, it's possible for each step to gradually improve performance on SHARE-J. The obstacle in the way of iterative spreading in polysyllabic words — the non-harmonically-improving intermediate step between resolving one SHARE-J violation are resolving the next — is not present in sequences of monosyllabic words. The contexts where spreading is iterative and where it is non-iterative follow from assumptions about gradualness in HS.

In Vata, the increased restrictiveness of juncture spreading is accounted for by ranking directionality constraints (INITIAL(F) and FINAL(F); McCarthy 2009) between SHARE-D and SHARE-J. With a ranking of SHARE-D ≫ FINAL ≫ SHARE-J, within-word harmony will be directionally unrestricted but juncture harmony will be Right-to-Left only. The account here proposed for Vata can easily extend to cases where the opposite situation obtains — cases where juncture spreading is *less* restricted than domain-internal spreading (for example, rounding harmony in Oroqen (Zhang, 1995) and tone spreading in Shona (Myers, 1987)).

The kind of selective non-iterativity found in Vata ATR harmony presents a rather serious problem for versions of OT with parallel analysis, but follows from the properties of gradualness in HS. Furthermore, Juncture- and Domain-specific versions of the SHARE constraint permit an account of cross-word-boundary spreading that extends beyond Vata to other languages with juncture-specific spreading processes.

(1) a. *kɔ le tlɛ*
man kill snake
'a man kills a snake'

b. k**o** l**e** tlɛ
(Right to Left)

c. *kɔ∼k**o** l**e** tl**e**
(Left to Right)

(2) a. *ɔ nɪ saka p**i***
3SG NEG rice cook
'He didn't cook rice'

b. ɔ nɪ sak**ʌ** p**i**

c. * ɔ nɪ s**ʌ**k**ʌ** p**i**

d. * ɔ n**i** s**ʌ**k**ʌ** p**i** (etc.)

(3) a. *ɔ ka za p**i***
3SG FUT food cook
'He will cook food'

b. ɔ ka z**ʌ** p**i**

c. ɔ k**ʌ** z**ʌ** p**i**

d. **o** k**ʌ** z**ʌ** p**i**

(4) SHARE[ATR]-DOMAIN$_{(PWd)}$: Assign one violation mark for every pair of adjacent segments s_i and s_j that are not linked to the same token of [F], where s_i, s_j, and [F] are contained within the same Prosodic Word.

(5) SHARE[ATR]-JUNCTURE$_{(PWd,IP)}$: Assign one violation mark for every pair of adjacent segments s_i and s_j that are not linked to the same token of [F], where s_i and s_j belong to different Prosodic Words and s_i, s_j and [F] are contained within the same Intonational Phrase.

(6)

ɔ nɪ saka p**i**	SH-D	SH-J	ID
a. ɔ nɪ saka p**i**		W_3	L
b. ☞ ɔ nɪ sak**ʌ** p**i**		2	1

ɔ nɪ sak**ʌ** p**i**	SH-D	SH-J	ID
a. ☞ ɔ nɪ sak**ʌ** p**i**		2	
b. ɔ nɪ s**ʌ**k**ʌ** p**i**		2	W_1

(7)

ɔ ka za p**i**	SH-D	SH-J	ID
a. ɔ ka za p**i**		W_3	L
b. ☞ ɔ ka z**ʌ** p**i**		2	1

ɔ ka z**ʌ** p**i**	SH-D	SH-J	ID
a. ɔ ka z**ʌ** p**i**		W_2	L
b. ☞ ɔ k**ʌ** z**ʌ** p**i**		1	1

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