Progressive front vowel harmony in Warlpiri: A Serial Harmony approach

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Warlpiri is a Pama-Nyungan language with about 3000 speakers, notable for exhibiting both progressive and regressive vowel harmony. This paper focuses on the unrestricted progressive harmony pattern, in which all [u] vowels become [i] under the influence of a preceding [i]. This rightward spreading of [front] may be blocked by [a] or a labial consonant, creating partial harmony.

Previous Optimality Theory (OT) analyses of this phenomenon have relied on local agreement constraints (Berry 1998; McCarthy 2003a; Harvey & Baker 2005). These constraints have been shown to have a "sour grapes" property (Padgett 1995; McCarthy 2003b); that is, to predict unattested solutions to disharmony in words with blockers. While AGREE-based accounts of harmony correctly predict that the spreading feature will spread completely in domains without blockers, they incorrectly predict that the spreading feature will be removed completely from domains with blockers. Blockers in the world's languages do not trigger this asymmetrical behavior; instead, they cause partial harmony, where a spreading feature successfully spreads to some segments in a domain before being checked. AGREE(F) is unable to model this.

In order to provide an analysis of Warlpiri vowel harmony that avoids these unwanted predictions, this paper adopts the framework of Serial Harmony (McCarthy 2009; 2011), developed within the architecture of Harmonic Serialism (McCarthy 2000 and others), a serial version of OT in which operations are optimized one at a time. Where previous analyses have driven feature spreading using AGREE(F), which penalizes a pair of adjacent segments that do not share the same specification for a (possibly equipollent) feature, Serial Harmony requires the use of SHARE(F) (McCarthy 2009), which penalizes a pair of adjacent segments that are not both linked to a single token of a privative feature, in this case [front]. In addition to penalizing pairs where only one segment is linked to [front] (as AGREE(front) would), SHARE(front) penalizes pairs where neither segment is linked to [front] and pairs where each segment is linked to its own token of [front].

Because of this difference in how the harmony-driving markedness constraint is formulated, a SHARE-based account avoids the unattested prediction that a word with a blocker could be stripped of all [front] associations in order to avoid disharmony. However, modifying CON by replacing AGREE(F) with SHARE(F) is not enough to rule out the possibility of spreading [front] to all segments except the blocker. A parallel OT account using SHARE(front) could still produce a winning candidate in which [front] has skipped over a blocker to continue spreading to the other segments in the word; this fails to model the fact that a blocker stops a spreading feature in its tracks.

In Warlpiri, [front] never spreads to segments beyond a blocker ([a] or a labial), so we need to account for partial harmony in input-output pairs such as /ŋaminʲi-ku-puɽaŋka/ → [ŋaminʲi-ki-puɽaŋka] (Nash 1986:87), where [front] has spread to the first suffix but not the second. To achieve blocking effects, we assume strictly local spreading (Ní Chiosáin & Padgett 2001 and others) and use a constraint against the co-occurrence of [front] and [labial] (*FRONT/LABIAL), which when ranked above SHARE(front) will prevent [front] from spreading to [p].

In Harmonic Serialism, if [front] fails to spread to [p], it can never spread to segments beyond [p] because GEN is limited to performing only one operation on a given pass. Tableau (1) shows this in the final pass in the derivation. The fully faithful candidate (1a) wins over alternative (1b) with [front] spread to [p] and alternative (1c) with [front] spread to [u]. In order to skip [p] and still reduce SHARE violations, [front] would have to spread to at least two adjacent segments beyond [p]. This is possible in parallel OT, but not with the limited GEN of Harmonic Serialism. Thus, sour grapes is not a problem for Serial Harmony.

(1)

	ŋaminʲi-ki-puɽaŋka	*FRONT/LABIAL	SHARE(front)	IDENT(front)
a. ☞	ŋaminʲi-ki-puɽaŋka		10	
b.	ŋaminʲi-ki-puɽaŋka	1!	9	1
c.	ŋaminʲi-ki-puɽaŋka		10	1!

Serial Harmony was initially illustrated using nasal harmony, with some comments regarding its application in vowel harmony contexts (McCarthy 2009). This analysis confirms that vowel harmony with blocking may be modeled within this framework, avoiding the typological problems inherent in previous OT analyses of Warlpiri vowel harmony.

References

Berry, Lynn Maree. 1998. Alignment and adjacency in Optimality Theory: Evidence from Warlpiri and Arrernte. Sydney, Australia: University of Sydney PhD dissertation. ROA-271.

Harvey, Mark & Brett Baker. 2005. Vowel harmony, directionality and morpheme structure constraints in Warlpiri. *Lingua* 115(10). 1457–1474. doi:10.1016/j.lingua.2004.06.007.

McCarthy, John J. 2000. Harmonic serialism and parallelism. In M. Hirotani, A. Coetzee, N. Hall, & J.-Y. Kim (eds.), *Proceedings of the 30th Annual Meeting of the North East Linguistic Society (NELS)*, 501–524. Amherst, MA: University of Massachusetts. ROA-357.

McCarthy, John J. 2003a. Comparative markedness. *Theoretical Linguistics* 29(1–2). 1–51. doi:10.1515/thli.29.1-2.1.

McCarthy, John J. 2003b. OT constraints are categorical. *Phonology* 20(1). 75–138. doi:10.1017/S0952675703004470.

McCarthy, John J. 2009. Harmony in harmonic serialism. University of Massachusetts, Amherst, ms. ROA-1009.

McCarthy, John J. 2011. Autosegmental spreading in Optimality Theory. In John Goldsmith, Elizabeth Hume, & Leo Wetzels (eds.), *Tones and features*, forthcoming. Berlin & New York: Mouton de Gruyter. ROA-1050.

Nash, David. 1986. *Topics in Warlpiri grammar*. (Outstanding Dissertations in Linguistics). New York: Garland. Slightly corrected, published version of Nash's 1980 dissertation.

Ní Chiosáin, Máire & Jaye Padgett. 2001. Markedness, segment realization, and locality in spreading. In Linda Lombardi (ed.), *Segmental phonology in Optimality Theory: Constraints and representations*, 118–156. Cambridge & New York: Cambridge University Press.

Padgett, Jaye. 1995. Feature classes. In J. Beckman, L. Dickey, & S. Urbanczyk (eds.), *Papers in Optimality Theory*, 385–420. (University of Massachusetts Occasional Papers in Linguistics 18). Amherst, MA: University of Massachusetts. ROA-112.