Zezuru coalescence and deletion: How to define gradualness in Harmonic Serialism

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The defining feature of Harmonic Serialism (HS), a post-Optimality Theory (OT) model, is that while OT allows for an unlimited number of changes to be made to the input when generating the candidate set (Prince and Smolensky 2004), HS is bound by gradualness, which is the notion that a 'single change' can be made to an input when generating the candidate set (McCarthy 2008, 2010). What is meant by a 'single change', however, is intentionally left somewhat vague (McCarthy 2008, 2010).

I investigate the nature of deletion and coalescence in Zezuru, a Bantu language, as they relate to gradualness and the definition of a 'single change'. Proposals vary for how phonological processes such as deletion proceed in HS; Kimper (2011) proposes that deletion proceeds in a single step, while McCarthy (2008) proposes a two-step deletion process, where Place features and other segmental information are deleted in separate steps. McCarthy's (2008) motivation for proposing that deletion is a multi-step process is adopting Chomsky and Halle's (1968) view of features as entities, rather than attributes of a segment.

I examine Zezuru vowel hiatus resolution (Kadenge 2010), where there is an interaction between deletion and coalescence. Coalescence occurs when the hiatus is a Low-High vowel sequence, as in (1a); deletion occurs with other hiatus types, as seen in (1b):

(1) a. /s**a** + **i**ni/ → [s**e**ni] 'like me' /n**a** + **i**mi/ → [n**e**mi] 'with you'
b. /m**u** + **o**to/ → [m**o**to] 'fire' /v**a** + **o**se/ → [v**o**se] 'all of you'

This data cannot be accounted for in traditional OT, as the repair strategy choice must be made via an interaction between the relevant faithfulness constraints, namely Uniformity and Max. However, there is no way to rank these constraints to consistently derive the correct output; ranking Uniformity over Max overpredicts deletion, and vice versa.

By adopting the notion of features as entities, HS can account for coalescence and dele- tion within the same analysis, by proposing that Zezuru 'coalescence' is actually a two-step process. First, there is a step consisting of the deletion of a [hi] feature, followed by a step where we see deletion of the first vowel as we see in other instances of deletion, as illustrated in the derivation below[1]:

Tableau 1: Step 1 *seni*

/sa-ini/	*Lo-Hi	*V-Place V-Place	MaxLo	MaxHi
→ a. saeni		*		*

[1] Deletion here is illustrated in the fashion of McCarthy (2008, 2010), where one step consists of the deletion of place features, followed by a deletion of the rest of the segmental material.

b. seini		*	* !	
c. saini	* !	*		

Tableau 2: Step 2 *seni*

/sa-eni/	*Lo-Hi	*V-Pl V-Pl	MaxLo	MaxHi	MaxPlStem	MaxPlAff
→ a. sVeni						*
b. saVni					* !	
c. saeni		* !				

Tableau 3: Step 3 *seni*

/sveni/	*V-Pl V-Pl	MaxPl	HavePlace	NoLink	Max
→ a. seni					*
b. sVVni		* !	* *		
c. sVeni			* !		
d. seeni				* !	

Tableau 4: Step 4 *seni*

/seni/	*V-Pl V-Pl	MaxPl	HavePlace	NoLn	NoReLn	Max
→ a. seni						
b. sVni		* !	*			

This view proposes that Zezuru coalescence isn't really coalescence in the sense of an independent process where one segment in the output corresponds to two segments in the input, but rather a two-step process consisting of assimilation followed by a subsequent deletion. Additionally, this analysis correctly predicts the vowel quality of the 'coalesced' vowel, as the only difference we see in (1a) is the removal of the [hi] feature from the underlying /i/ and deletion of /a/.

This observation raises questions about gradualness. If deleting one feature can constitute a single step, does this mean that deleting one feature is always a single step? If it always is, then this raises a major issue for gradualness: computational efficiency. The amount of derivations that many phonological processes would require could become quite excessive.

To resolve this issue, I propose to re-define gradualness, specifically what is meant by a 'single change'. The view of gradualness I propose is what I call local gradualness. In this view, a change is defined as a single change iff this change repairs a violation of the highest ranked constraint that is violated by the input/fully faithful candidate. This retains the advantages of intermediate steps seen in the Zezuru analysis and other analyses discussed by McCarthy (2008, 2010), while also resolving the issue of computational efficiency posed by the fact that it seems that in, at least some circumstances, the notion of a 'single change' could be as small as the deletion of a single feature.

References

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