Shift happens! Shifting in Harmonic Serialism

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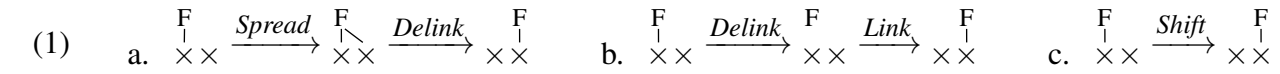
Phonological theory has attributed stress, tone, and segmental shift to unrelated mechanisms. This paper looks at shift in Harmonic Serialism (HS) and proposes a unified analysis. We argue that shift must be a possible Gen operation. We back this up with cross-linguistic and typological evidence, tested using OT-Help 2.0 (Staubs et al. 2010).

Shift has been considered a two-step phenomenon in Autosegmental Phonology (Goldsmith 1976): spreading and delinking (1-a), or delinking and linking (b). The distinction between the two is irrelevant in OT (Myers 1997; Yip 2002), but it does matter in serial variants of OT, such as HS. McCarthy (2006) and McCarthy et al. (2012) use a two-step analysis. We argue that the evidence instead suggests that Gen must be able to shift features and stress in a single step (1-c).

(1)



Despite no detailed study, stress shift has been standardly considered a possible Gen operation in HS. In Ukrainian, for instance, stress shifts in the plural. Alderete (1999) attributes stress shift to anti-faithfulness constraints, which require morphologically related forms to be dissimilar. Along these lines, Yanovich & Steriade (2010) propose constraints that favor paradigmatic contrast (2).

(2) SINGULAR≠PLURAL (henceforth, SG≠PL)
Assign a violation mark for each pair of stems with identical stress grids whose morphological feature matrices differ in [singular/plural].

While SG≠PL can be satisfied by shifting stress in the plural (3-a), it can also be satisfied by adding (b) or removing stress (c), which are possible Gen operations (McCarthy 2008, 2010). If stress shift is not a possible operation—and (3-a) would not be generated—then we predict that related forms may surface as unstressed or doubly stressed. We know of no languages in which only some members of the paradigm would lack stress or have double stress. If, however, shift is possible, then the pathological candidates (3-b-c) are harmonically bounded by the shifting candidate (a).

(3) Ukrainian shifting grammar: Step 1 (singular: kóles-o)

/kóles-a/	SG≠PL	IDENT(stress)	CULMINATIVITY	HAVESTRESS
a. ☞ kolésa		*		
b. kólésa		*	*!	
c. kolesa		*		*!
d. kólesa	*!			

Tone-shifting patterns often involve a prominent target (σ́ or edge) that may be several Tone Bearing Units (TBUs) away. Consider a language like Chizigula (Kenstowicz & Kisseberth 1990), where a High tone shifts to the penultimate TBU. Shift (4-a) violates more faithfulness constraints than spreading (c), which violates the constraint against branching. At each of the following steps, tone shifts to the following TBU until it reaches the penult position. Now consider the alternative non-shifting grammar, in which tone is spread and delinked, as in (1-a). At step 1, candidate (4-c) would win, which means that ALIGN-R must outrank *BRANCH. At step 2, delinking wins (6-a). Further spreading (6-c) must be ruled out, which requires *TERNARY (5).

(4) Pseudo-Chizigula shifting grammar: Step 1

/ μ μ μ μ μ μ μ /	*BRANCH	NONFIN	ALIGN-R	MAXLINK	DEPLINK
a. ☞ μ μ μ μ μ μ μ			***	*	*
b. μ μ μ μ μ μ μ			****!		
c. μ μ μ μ μ μ μ	*!		***		*

(5) *TERNARY (after Uffmann 2005; Topintzi & van Oostendorp 2009)
T must not be linked to more than two Tone Bearing Units.

(6) Pseudo-Chizigula non-shifting grammar: Step 2

/ μ μ μ μ μ μ μ /	NONFIN	*TERNARY	ALIGN-R	*BRANCH	MAXLINK	DEPLINK
a. ☞ μ μ μ μ μ μ μ			***		*	
b. μ μ μ μ μ μ μ			***	*!		
c. μ μ μ μ μ μ μ		*!	**	*		*

The non-shifting analysis relies on *TERNARY which penalizes sequences of multiple constituents. Such constraints are known to cause pathologies in HS. For instance, FOOTBINARITY causes pathological local weight sensitivity as a function of the number of syllables in the whole word (Pruitt 2012). The shifting grammar does not require *TERNARY, thus avoiding such pathologies.

The final piece of evidence comes from segmental shift. Consider shifting in Halkomelem (Hukari & Peter 1995), which exhibits lowering of stressed /é/ when followed by an /a/, which subsequently reduces to [ə]: /néts'-θat/ → nát̲s'-θat → [náts'-θə̲t] 'change'. This process can be analyzed as shifting of the feature [+low]. If shifting is allowed in a single step, both faithfulness constraints can be ranked below the reduction constraint *UNSTRESSED/a (7). If shifting is *not* allowed by Gen, spreading (b) must obtain at step 1, which requires that MAX[+low] crucially outranks *UNSTRESSED/a. This ranking creates a paradox, in which forms with multiple /a/'s fail to display reduction: /páj-θat/ → *[páj-θat], [páj-θə̲t] 'curved'. This problem does not obtain in the shifting grammar, because the reduction constraint is undominated, as in (7).

(7) Halkomelem shifting grammar: Step 1

/ n é ts' - θ a t /	*UNSTRESSED/a	MAX[+low]	MAXLINK[+low]	*éC$_0$a
a. ☞ n á ts' θ ə t			*	
b. n á ts' θ a t	*!			
c. n é ts' θ a t	*!			*
d. n é ts' θ ə t		*!		

Segmental shift is an underreported, but attested pattern. We document 15 cases which include rounding (Gitksan), place (Kinyarwanda), nasality (Karajá), and laryngeal features (Ayutla Mixe).

The representations of stress, tone, and segmental features differ in phonological theory, yet HS offers a framework to unify shift as one phenomenon. Shift is a single operation in HS.