No Metathesis in Harmonic Serialism
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This paper presents a Harmonic Serialism (HS, Prince and Smolensky 1993/2004, McCarthy 2000) analysis of synchronic metathesis, proposing to eliminate metathesis as a single operation, instead analyzing apparent metathesis cases as copy + deletion or fusion + fission, and not as segment reordering. Removing metathesis as a single operation has the benefit of limiting the typology in several ways, including limits on long-distance metathesis and restrictions on the types of consonants that can undergo CC-metathesis; in addition to simplifying the inventory of operations in Harmonic Serialism.

CV metathesis as copy + deletion: Rotuman phase alternations (McCarthy 2000) exhibit apparent metathesis, deletion and coalescence (1). In my analysis, I derive all three patterns as copy + deletion and subsequent vowel fusion depending on sonority of the two vowels.

(1) Metathesis: /puɾe2/ → [puɾe2ɾ]   Deletion: /ɾa1ko2/ → [ɾa1k]   Coalescence: /ho1ti2/ → [hɔ1,2t]

I propose that Rotuman alternations are driven by a requirement for stressed heavy syllables (SWP) and final stress (FINALSTRESS). First, trochaic stress is assigned by higher ranked prosodic constraints (Step 1), then a vowel is copied into the stressed syllable to satisfy SWP (Step 2). Finally, the word final V₂ deletes (Step 3) to satisfy FINALSTRESS.

(2) UR: /pʊɾe2/ → Step 1: pʊɾe2 → Step 2: pʊe2ɾe2 → Surface [pʊe2ɾ]

I analyze both apparent deletion (/ɾako/ → [ɾak]) and coalescence (/ho1ti/ → [hot]) as going through the same process of vowel copying into the stressed syllable, and deletion of word-final vowel, followed by vowel fusion to resolve LIGHT-DIPH violations (3). Only vowel sequences of rising sonority can appear as diphthongs in a closed syllable in Rotuman. LIGHT-DIPH militates against VV sequence of non-rising sonority (McCarthy 2000). While the deletion of word final vowels in Step 1 is blocked by undominated MAX, deletion of the same vowel at Step 2 (ɾa₁o₂k₀₂) does not violate MAX since all of the input segments have (co-indexed) correspondents in the output. At Step 4, vowel fusion is preferred to deletion because of this undominated MAX.

(3) /ɾa₁ko₂/ → 1. ɾa₁ko₂ → 2. ɾa₁o₂k₀₂ → 3. ɾa₁o₂k → 4. [ɾa₁,k]
   /ho₁ti₂/ → 1. hο₁ti₂ → 2. hο₁i₂ti₂ → 3. hο₁i₂t → 4. [hο₁,2t]

Comparison to Parallel OT analysis: McCarthy’s (2000) parallel analysis relies on the ranking of LIGHT-DIPH, FINALSTRESS >> MAX >> LINEARITY, with lower ranked MAX. However, Carpenter (2002) points out that such constraint ranking does not rule out problematic candidates such as [ɾo₂ak₁] with long-distance metathesis, and claims that LINEARITY alone cannot prevent unattested metathesis patterns. In Parallel OT, the use of LINEARITY to penalize metathesis has been claimed to have both conceptual and empirical problems (e.g. Carpenter 2002, Heinz 2005, Canfield 2015 a.o.). Some have proposed proliferation of additional faithfulness constraints such as a family of ADJACENCY(DOMAIN) (Carpenter 2002), CONTIGUITY (Heinz 2005), and LINEARITY constraints (McCarthy 2000, Canfield 2015), to deal with problematics cases.

LINEARITY in HS: LINEARITY in HS is less problematic because of the gradualness of GEN (McCarthy 2007). However, assuming metathesis as an atomic operation in analysing Rotuman allows unattested patterns to surface even in HS. Deriving both apparent deletion (/ɾako/ → [ɾak]) and coalescence (/ho1ti/ → [hot]) with a metathesis operation requires intermediate stage candidates [ɾa₁o₂k] and [hο₁i₂t] which are followed by vowel coalescence ([ɾa₁,k] and [hο₁,2t]).
This derivation is made possible by the ranking MAX >> LIGHT-DIPH, FINAL-STRESS >> LINEARITY. However, because of this lower ranked LINEARITY, the unattested long-distance metathesis candidate [ro₂a₁k] will be predicted as a possible output since it does not violate any of the higher ranked constraints. On the other hand, my copy + deletion and subsequent fusion analysis will not allow such long-distance patterns since /ra₁o₂k/ → [ro₂a₁k] will require an intermediate stage of /ro₂a₁o₂k/, which is not harmonically improving given any plausible Rotuman ranking.

My proposed HS analysis of Rotuman also provides insights as to how vowel fusion might surface via gradual assimilation processes such as in (4). Vowel fusion in HS is challenging since it potentially incurs more than one violation of faithfulness. Candidates with multiple unfaithful mappings are thought not to be generated by a gradual GEN.

(4) /ho₁t₁z₁/ → ... → ho₁i₂t → ho₁i₂t → ho₁y₂t → ho₁t₂t → ho₁t₂t

In my analysis, the vowel sequence of falling sonority undergoes feature by feature assimilation with one faithfulness violation at a time. When the two vowels become identical to each other, they fuse with a single violation of UNIFORMITY.

Support for copy + deletion: Removing metathesis as an atomic operation altogether frees us from all of the LINEARITY problems, including the ones discussed above, since this constraint would no longer be violated. My copy + deletion analysis extends smoothly to many other CV metathesis cases including Kwara’ae (Heinz 2004, 2005), Leti (Hume 1997), Mohawk (Michelson 1988), Palestinian Arabic (Kager 1999) and others. Strong evidence to prefer such analyses comes from forms that reflect the intermediate stage with a copied vowel without deletion (e.g. /salo/ → [saol] but optionally [saolo] in Kwara’ae, see Heinz 2005).

CC metathesis as fusion + fission: The copy + deletion analysis is not generally desirable for CC metathesis cases since it would require an intermediate stage of C₁C₂ → C₂C₁C₂ which is unlikely to improve harmony in any language. Instead, I propose that apparent CC metathesis is the result of fusion + fission.

Balangao (Shelter 1976) exhibits synchronic CC metathesis. Upon affixation, a vowel deletes and creates a glottal + plosive sequence which surfaces as plosive + glottal (e.g. /ʔi + hıgil/ → /ʔıghıp/ ‘bring in’). I analyze this as fusion (/h₁g₂/ → [g₁h₂]) and subsequent fission (→ [g₁h₁]). Analyzing CC metathesis as fusion + fission predicts the generalization that certain consonant pairs are more susceptible to metathesis than others. Unlike CV metathesis which often affects all segments in the given language, there is no CC metathesis that applies to any consonants in the language. My analysis requires a complex segment in a harmonically improving intermediate stage. I predict that apparent transposition of CC on the surface form is only possible for fusible pairs of consonants.

Conclusion: My analysis of synchronic metathesis simplifies the inventory of operations in HS. I show that the typology of metathesis can be predicted by deriving the patterns through sequential applications of simpler operations such as copy + deletion and fusion + fission, including the restrictions on observed CC metathesis cases.