Compensatory lengthening in Harmonic Serialism
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Compensatory lengthening (CL) involves the deletion of one segment and the lengthening of another, usually adjacent segment. Autosegmental approaches to the analysis of CL treat lengthening as the preservation of mora count; that is, a mora that was originally linked to a deleted weighted coda is reassigned with the preceding vowel, thereby lengthening it: /CV\_µC/ → /CV\_µ\_µ/ → [CV\_µ\_µ] ([01]). In this paper, I argue that maintaining the core insight of the autosegmental approach in a constraint-based framework requires assigning faithfulness violations relative to a syllabified and moraically specified form of the input. While this is not feasible in parallel Optimality Theory (OT, [02]), it is possible in Harmonic Serialism (HS, [03]) if we make an additional assumption that each derivation begins with a fully faithful candidate (FFC, [04]).

Synchronic CL While CL is often thought of as a diachronic change, it is a cross-linguistically common productive synchronic process as well. CL is attested in Japanese, colloquial Farsi, colloquial Persian, and many other languages ([05]). In the Ižma dialect of the Finno-Ugric language Komi, deletion of stem-final /l/ triggers CL of the preceding vowel if the /l/ is followed by a consonant or a word boundary (1b):

(1) a. /kil-i/ → [kili] ‘hear (1.SG.PAST)’ b. /kil-ni/ → [kini] ‘hear (INF)’

The fact that lengthening is not triggered by deletion of the onset /l/ in (1a) reflects the universal generalization that CL is only caused by the loss of a moraic segment.

Problems for parallel OT CL is problematic for parallel OT for two reasons. First, the phenomenon involves two separate processes—deletion and lengthening—that incur two separate faithfulness violations. This means that a candidate with CL will be harmonically bounded by two competitors: one in which there is deletion but no lengthening (2a), and another in which the wrong consonant deletes (2b):

(2) a. \[ k i l n i \] *CODA \ MAX \ DEP(\mu) b. \[ k i l n i \] *CODA \ MAX \ DEP(\mu)

The second problem for parallel OT is that CL is opaque ([04]). Underlying representations are not syllabified, so it is impossible to tell from the input whether a given segment will be syllabified as an onset or a coda. This in turn means that moraic specification of coda consonants cannot be present in the input and must be derivable by a constraint like WEIGHTBYPOSITION (WBP, [01]). If the moras associated with weighted codas are not present in the input, it is impossible to analyze CL as the preservation of mora count in parallel OT.

Challenges for HS HS includes a derivational component (inputs pass through the same constraint ranking multiple times, with a single change made at each step) that has been exploited to ensure that metrical structure is built before segments are deleted ([06]). But if we assume that the winning candidate at each step incurs exactly one faithfulness violation, we encounter a ranking paradox: the ranking MAX \gg *CODA must hold to prevent the segment from deleting before a mora can be inserted to be associated with it. For the segment to delete later in the derivation, though, *CODA must be ranked above MAX. A further challenge arises when we consider that the required mora-sharing analysis of CL requires the constraints DEP(\mu) and DEP-LINK(\mu), both of which are violated when a mora is inserted. In the paper, I redefine DEP-L(\mu) so that it is consistent with HS’s gradualness requirement.
The solution: HS + a FFC  If we assume that the HS derivation begins with a FFC the ranking paradox is avoided. Because the input to the first pass is moraically specified, there is no need for MAX to outrank *CODA until the mora associated with the weighted coda is inserted. (Note that *µ/C does not penalize moras that are shared between a consonant and a vowel.)

\[ \begin{align*}
\text{(3)} & \quad \text{a. First pass} \\
& \quad \begin{array}{|c|c|c|c|c|c|c|}
\hline
& \mu & \mu & \mu & \mu & \mu & \mu \\
\hline
k & i & l & n & 1 & WBP & *\text{FLOAT} & \text{MAX}(\mu) & *\text{CODA} & \text{MAX} & *\mu/C & \text{DEP-L}(&\mu) & *\text{SHARE} \\
\hline
a. & \mu & \mu & \mu & \mu & & & & & * & ! \\
\hline
b. & \mu & \mu & \mu & \mu & & & & & * & ! \\
\hline
c. & \mu & \mu & \mu & \mu & & & & & * & ! \\
\hline
d. & \mu & \mu & \mu & \mu & & & & & * & ! \\
\hline
\end{array}
\end{align*} \]

Thus, the analysis sidesteps the problem of how to bring all inputs, which may or may not have the correct moraic specification, into line with wellformedness conditions on moraic structure.

Conclusion  A HS analysis of CL is possible only if we make an auxiliary assumption: namely, that the derivation begins with a syllabified and moraically specified form. FFCs are used in OT with Candidate Chains, which is a closely related framework, but they are not standardly assumed in HS. It is clear, though, that an analysis of CL cannot get off the ground if weighted codas are not present in the input. The resulting analysis is thus very similar to pre-OT approaches. In the paper, I discuss additional implications of the analysis, including its inability to derive lengthening triggered by a non-adjacent segment.