Tone Sandhi Alternations as Melody-Local Grammars (Jetlag Edition)

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So far, we have been looking at tone sandhi, with a specific eye toward disyllabic sandhi in Tianjin and Nanjing. Before positing new functions which operate over register/melodic tiers, it is important to determine how much mileage we can get out of the `cntr(w)` function and the OCP. Previous writeups have shown that the `mldy(w)` function makes incorrect predictions about surface sandhi patterns in these two dialects, however `cntr(w)` has not been explored in detail.

1 The `cntr(w)` Function

Jardine (2018:43) posits the `cntr(w)` function, which "'expands' contour-toned TBUs (but leaves H and L-toned TBUs as is)".

(1)

`cntr`(F)	=	HL
`cntr`(R)	=	LH
`cntr`(LR)	=	LLH

Let us examine how this function can be applied to tone sandhi in Tianjin and Nanjing.

2 Tianjin

Recall the Tianjin data:

(2)

Input		Output
LL	→	RL
RR	→	HR
FF	→	LF
FL	→	HL

The Tianjin sandhi data comprise syllable- and melody-level dissimilation patterns. An OCP constraint on strings (assuming contours as primitives) captures the first three patterns straight-forwardly; the set of forbidden substructures below includes adjacent identical elements. But what of the fourth pattern?

(3) $\mathcal{S}_{TJ}$ = {LL, RR, FF, FL(?)}

Expanding the string FL via `cntr(w)` yields HLL. One possibility is that the illformedness of the structure is due to the presence of adjacent L segments—an OCP effect—in the output of `cntr`(FL) (or in other words, in the *melody*?). Eschewing the `mldy(w)` function for a moment, we can characterize this ungrammatical melody in Tianjin in (at least) two ways:

(4) a. HLL

b. LL

Considering only the LL sub-melody of the output of `cntr`(FL) captures the OCP-ness of the structure's illformedness. It also mirrors the string-level prohibition on adjacent sequences of L; Tianjin sandhi is sensitive to these sequences both at the syllable level and on the melodic tier. However, these representations are problematic, as they are sub-melodies of acceptable outputs to the `cntr(w)` function, namely `cntr`(FR) = HLLH. Retaining the contours-as-primitives representation (that is, R and F) circumvents this problem, as FL is not equivalent to FR.

An important generalization is potentially lost here, however; prohibited sequences are resolved either through contour simplification (in the case of **R**R → **H**R, **F**F → **L**F, and **F**L → **H**L) or through creation of a contour from a level tone (LL → RL). This suggests that the contour tones are indeed sequences of level tones which can be manipulated through deletion or addition of associations. `cntr(w)` is of potential use here, because it yields the sequences of H and L which can be manipulated in these alternations. As implied above, though, the OCP intuition afforded by the F and R representation is lost in the application of this function.

3 Nanjing

The Nanjing data are less straightforward still. Recall the six observed disyllabic sandhi alternations, where Tq stands for a checked tone:

(5)

Input		Output
FF	→	HF
LL	→	RL
RHq	→	LHq
HHq	→	FHq
LH	→	RH
LF	→	RF

Of the four dissimilatory patterns, two exhibit sensitivity to syllable-level tones (FF and LL), while two are arguably triggered by adjacent H elements on the melodic tier (RHq and HHq). The melodic tier is also the locus of the assimilation alternations.

There is a symmetry between the assimilation and dissimilation patterns. Feeding RHq and LF into the `cntr(w)` function yields the TBU strings that contain the prohibited identical and non-identical substrings, respectively. This creates a uniformity in the characterizations of the prohibited sequences that trigger sandhi, whether they are dissimilatory or assimilatory in nature.

(6)

`cntr`(RHq)	=	L**HH**q	≈	**HH**q	(dissimilation)
`cntr`(LF)	=	**LH**L	≈	**LH**	(assimilation)

But then how to characterize these in terms of illicit substructures? The same issue arises here as did for the Tianjin patterns. Thinking only in terms of two-factors on the melodic tier, HH and LH predict other well-formed sequences of tones to be ungrammatical, namely sequences of two (non-checked) high tones HH, and a single rising tone (as the output of `cntr`(R) = LH).

4 Summary

Using the `cntr(w)` function and OCP over string representations to characterize tone sandhi patterns in Chinese dialects fares better than earlier attempts using the `mldy(w)` function. Intuitions about the locus of OCP restrictions are clearer using this representation. In spite of this progress, similar problems plague this analysis as did those which utilize `mldy(w)`: certain grammatical structures are predicted to be ill-formed. Some greater degree of specification (perhaps enrichment of the representation to include syllable boundaries) is needed to disambiguate well-formed and ill-formed structures in the data.