

Doubly Triggered Harmony as Subphonemic Agreement-by-Correspondence

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This paper proposes a modification of Agreement-by-Correspondence (ABC) theory that accounts for doubly-triggered assimilations caused by subphonemic threshold effects.

The unusual case of Laal (unclassified, Chad) is presented, in which rounding harmony requires two triggers which, unlike the rare but familiar cases of Cantonese (Flemming 1997) and Woleaian (Suzuki 1997), can either be on the same side of the target or on opposite sides. As shown in (1), in this language with maximally disyllabic words, the first vowel of a root is rounded in the presence of a round V_2 of identical height, only if the root contains a labial consonant before (1a) or after (1b) the target.

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|-----|------------|----------|----------------|-----------------|
| (1) | a./bìr-ú/ | > b̀ùr-ú | ‘hook-pl’ | (Height, Lab) |
| | b./t̀àb-ó/ | > t̀òb-ó | ‘fish(sp.)-pl’ | (Height, Lab) |
| | c./gín-ù/ | > gín-ù | ‘net-pl’ | (Height, *Lab) |
| | d./m̀àg-ú/ | > m̀òg-ú | ‘tamarind-pl’ | (*Height, Lab) |
| | e./d̀èn-ú/ | > d̀òn-ú | ‘tree(sp.)-pl’ | (*Height, *Lab) |

I claim that this harmony is driven by a subphonemic similarity threshold effect. I argue that /i,ə/ in (1)a-b are subphonemically rounded [i̠,ə̠] due to the coarticulatory effect of the labial consonant. Drawing from Terbeek (1977), Linker (1982), and Stevens (1998), I propose a rounding similarity scale based on vowel height and backness that includes a subphonemic level. Rounding harmony occurs when the similarity between subphonemically rounded V_1 and round V_2 reaches a certain threshold on this scale.

I further show that ABC — initially developed for long-distance consonant agreement (Hansson 2001, Rose & Walker 2004, a.o.), and later extended to vowel harmony (Sasa 2009, Rhodes 2012), consonant-tone interaction (Shih 2013), and the behavior of contour segments and tones in harmony processes (Inkelas & Shih 2013) — can also account for doubly-triggered assimilations such as that of Laal, on the condition that it be granted access to subphonemic information.

Specifically, I propose to allow CORR-XX constraints to refer to subphonemic levels of similarity: each degree of similarity n on any given similarity scale for a particular property P (e.g. rounding) corresponds to a separate CORR _{α} -XX(P- n) constraint (cf. (2)). All the constraints referring to the degrees of a given similarity scale are ranked in descending order of stringency (e.g. CORR-XX(P-3) >>CORR-XX(P-2) >>CORR-XX(P-1)). A co-indexed IDENT _{α} -XX[ϕ] constraint (cf. (3)) enforces agreement in the phonological feature [ϕ] corresponding to the property P, between segments that participate in the relevant correspondence, *i.e.* that are at least n -similar in P. Co-indexing the relevant CORR-XX and IDENT-XX constraints is shown to be crucial when dealing with multiple correspondences (in this case multiple correspondences affecting the same property).

- (2) CORR _{α} -XX(P- n): Any two or more segments within an output string are in correspondence iff their similarity in the phonetic property P reaches level n on the similarity scale corresponding to P.
- (3) IDENT _{α} -XX[ϕ]: Any two or more segments in an output string agree in the phonological feature [ϕ] iff they are all in the correspondence relation defined as CORR _{α} -XX(P- n), and if [ϕ] \subset P.

The relative ranking of these two constraints and other faithfulness and markedness constraints is shown to account for the Laal data. The analysis proposed here strengthens ABC, by showing that it can insightfully account for

- cases of assimilation involving subphonemic/subfeatural properties
- both local and long-distance effects of assimilation.

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