Minimal prosodic recursion in Khoekhoegowab

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Background: Khoekhoegowab (Central Khoisan, Namibia) has an opaque process of melodic substitution generally called sandhi in the descriptive literature. Lexical items are underlyingly associated with one of 6 melodic contours; sandhi maps each 'citation form' contour onto an arbitrary 'sandhi form' contour (Haacke, 1999; Brugman, 2009). The citation and sandhi forms are shown in the table in (1).

Sandhi applies within roughly-XP-sized domains, and at first glance shows no evidence for recursion. For example, within DPs normally only the leftmost word will surface in its citation form, while all others will undergo sandhi. If we take the domain of sandhi to be the phonological phrase (φ), then most XPs are mapped to exactly one non-recursive φ. (In example (2) and all following examples, words receiving citation melody are typeset in bold; all other words receive their sandhi form.)

Sandhi on verbs: However, a close investigation of sandhi on the verb reveals indirect evidence for recursive phonological phrases. Khoekhoegowab sentences are typically verb-final; if VPs followed the same pattern as DPs, we would then expect verbs to undergo sandhi exactly when taking an object or low-attaching adverb. Instead, I will show based on original fieldwork that verbal sandhi depends exclusively on the position of tense-marking in the sentence. Khoekhoegowab expresses tense, aspect, and polarity with a set of enclitic particles. These particles fall into two classes: Light, monomoraic particles appear before the verb (3-a), while bimoraic particles appear after the verb (3-b). Sandhi on the verb depends entirely on the position of tense marking: When the tense particle precedes the verb, it triggers sandhi; otherwise, the verb retains its citation form.

Surprisingly, this is true even at a distance. In VP-coordination structures the single preverbal tense marker may freely occur in either the first or the second conjunct. When it occurs in the second conjunct as in (4-a), only the second verb undergoes sandhi; when it occurs in the first conjunct as in (4-b), both verbs do. This rules out an analysis *a la* Haacke (1999) where it is being right-adjacent to a tense marker that triggers sandhi on the verb.

In order to explain this, I follow López (2009) in proposing that prosodic phrasing is subject to a constraint requiring that extended projections (Grimshaw, 1991) not be separated by prosodic boundaries. In Khoekhoegowab, this has the effect of requiring that the verb be phrased together with the tense marker, wherever it occurs. While in (4-b) this groups the verb ‖*ama* with the tense marker preceding it, in (4-a) this constraint will require an anomalous phrasing in which the verb forms a prosodic constituent with the second conjunct to the exclusion of the first. This leaves the verb at the left edge of the phonological phrase, allowing us to maintain the generalization that sandhi affects all but the leftmost word in each phrase.

Recursive φs: If this analysis is on the right track, then phonological phrases in Khoekhoegowab allow at least one level of recursion. In example (4-b), the object of the second verb still receives its own sandhi domain, but the verb following it must phrase with the tense marker preceding it. The result is the prosodic structure like (5), in which the φ containing the DP is contained by a larger φ containing the verbs and tense marker. I'll show that this structure can be achieved in Match Theory (Selkirk, 2011): A constraint NONRECURSIVITY-φ is overruled by the constraint on extended projections, allowing minimal recursion just in order to phrase the verb and tense-marker together.

(1) Sandhi forms:

Citation	Sandhi
SL-L	SL-L
SL H	L-SL
L H-SH	L
SH	H

(2) a. **súűku**
        pots

    b. **|ápá** sùùku
        red   pots

    c. **!nání** |àpa sùùku
        six   red   pots

    d. **‖náá** !nàni |àpa sùùku
        those six   red   pots

(3) a. **|Gőâ-i** ge   ra   àa.
        baby   DECL IMP cry.
        "The baby is crying."

    b. **|Gőâ-i** ge   áá tama
        baby   DECL cry NEG.NONFUT
        "The baby isn't crying."

(4) a. **Dandagob** ge   **‡khánísa** **‖ámá** tsi **né** khòes go   mà.
        D.   DECL book   buy   and this woman PST give
        "Dandago bought the book and gave it to this woman."

    b. **Dandagob** ge   **‡khánísa** go   ‖àma tsi **né** khòes mà.
        D.   DECL book   PST buy   and this woman give
        "Dandago bought the book and gave it to this woman."

(5) (**Dandagob** ge) ((**‡khanisa**) go ‖ama tsi (**ne** khoes) ma)

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