Recursive prosodic words in the prefixal field of Kaqchikel (Mayan)

The strict layer hypothesis (SLH) is a set of formal restrictions proposed to hold over the nesting of prosodic constituents (1) (e.g. Selkirk 1984, Nespor & Vogel 1986, etc.).

(1)  
a. Prosodic categories are arranged into a hierarchy reflecting their relative sizes:
   \[ \nu > \iota P > \phi P > \omega > \text{Foot} > \sigma > \mu \]

b. Prosodic constituents of level \( \kappa \) only dominate constituents of level \( \kappa - 1 \).

Empirical challenges to the strongest form of the SLH (1) have come from cases of level-skipping (\( \kappa \) dominating \( \kappa - 2 \)) and recursion (\( \kappa \) dominating \( \kappa \)) (e.g. Selkirk 1995, Peperkamp 1997, Itô & Mester 1992/2003, 2009). While level-skipping has been widely accepted, prosodic recursion remains more contentious. Some researchers reject prosodic recursion altogether (e.g. Vogel 2009a,b, Schiering et al. 2010). Others admit a limited form of prosodic recursion, but claim that the topmost level in a recursive \([\pi X [\pi Y]]\) structure does not count as a full-fledged instance of the category \( \pi \) (e.g. Vigário 2010, Frøta & Vigário 2013). Lastly, some authors reject prosodic hierarchy theory as a whole, and thus necessarily reject prosodic recursion as well (e.g. Kaisse 1985, Pak 2008, Scheer 2012).

In this presentation I argue that recursion of the prosodic word \( \omega \) is unambiguously required for an adequate theory of prefixal phonology in Kaqchikel (Mayan). The key phenomenon—initial glottal stop insertion—receives an elegant treatment if unbounded, iterative recursion of the prosodic word is permitted (2).

(2) \([\omega X [\omega Y [\omega Z \ldots [\omega W ]]]]\)

The prefixal phonology of Kaqchikel: Kaqchikel has two classes of prefixes which can be distinguished by their prosodic behavior (3). Low-attaching affixes are parsed into the same prosodic word as their host, while high-attaching affixes are parsed outside of the prosodic word containing their host.

(3) a. \([\omega \text{LowPref-Host}]\)    b. \(\text{HighPref}=[\omega \text{Host}]\)

These prosodic differences can be diagnosed by convergent evidence from glottal stop insertion and degemination.

In Kaqchikel, vowel-initial words bear an epenthetic glottal stop on the surface (4) (e.g. Bennett 2016). (Data is given in the standard Kaqchikel orthography. Specifically phonetic transcriptions are set off with ‘[ ]’. Data from Majzul 2007.)

(4) a. \(\text{jun [?]ab’äj ‘a stone’}\)  b. \(\text{lajuj [?]ik ‘ten chiles’}\)

[?] -insertion is bled by low-attaching prefixes, like the aspect prefix \( x - \) (5). Since low-attaching prefixes are internal to the \( \omega \) containing their host, such prefixes remove stem-initial vowels from \( \omega \)-initial position, thereby eliminating the context for [?] -insertion.

(5) a. \(\text{/-ok/ ‘to enter’}\)    b. \(\text{\( x \)-ok, *[x-?]ok ‘(S)he entered.’}\)

\(\omega\text{-ASP-VERB}\)

In contrast, high-attaching prefixes do not bleed [?] -insertion. These prefixes, being outside the \( \omega \) containing their host, co-occur with an epenthetic [?] in the stem.
(6) a. aj=ejqa’n / *aj=ejqa’n
   AGT=cargo
   ‘porter’

   b. ach=amaq’ / *ach=amaq’
   COM=nation
   ‘federation of states’

The prosodic contrast between high- and low-attaching prefixes is further confirmed by the fact that only the low-attaching prefixes trigger degemination when affixation creates a sequence of adjacent identical consonants (examples omitted here for space).

Kaqchikel permits multiple high-attaching prefixes to co-occur in a single word (7). When such prefixes are vowel-initial, each undergoes a separate instance of [?] insertion.

(7) [?]at=[?]ach=[?]aj=mak
   ‘You are an accomplice’

The multiple instances of [?] insertion in (7) are expected if high-attaching prefixes induce a recursive \(\omega\) structure (8a): each prefix will be initial in some \(\omega\), and thus subject to the same patterns of \(\omega\) level phonology. (High-attaching prefixes are not stressed, and therefore not independent \(\omega\)s, \(*[\omega\text{ HighPref}]=[\omega\text{ Base}]\).)

(8) a. \([\omega\text{ ABS}=[\omega\text{ COM}=[\omega\text{ AGT}=[\omega\text{ ROOT}\]]]]\]

b. \([??\text{ ABS}=[??\text{ COM}=[\text{CLGr}\text{ AGT}=[\omega\text{ ROOT}\]]]]\]

To account for the three loci of epenthesis in (7) without prosodic recursion, we would need to assume four different prosodic categories within the same morphological word (8b). This goes beyond the number of distinct prosodic categories (two) typically used to account for word-level phonology in versions of the prosodic hierarchy which reject recursive nesting of prosodic levels (\(\omega\) and the CLITIC/PROSODIC WORD GROUP; Nespor & Vogel 1986, Vogel 2009a,b, Vigário 2010, Frota & Vigário 2013, etc.). Furthermore, without recursion of the prosodic word there is no principled reason why each of the high-attaching prefixes in (7) should condition the same phonological process ([?] insertion). On the other hand, if recursion of the prosodic word is permitted, and if each level of the structure in (8a) counts as a bona fide instance of \(\omega\) (pace Vigário 2010), the multiple loci of [?] insertion are unsurprising.

To round out the argument, I show that purely derivational treatments of this data, which attempt to derive the details of prefixal phonology from the serial interleaving of phonology and morphology, make incorrect predictions regarding other aspects of the grammar of Kaqchikel (particularly regarding affix ordering and suffixal phonology). The overall conclusion is that both abstract prosodic categories and prosodic recursion are needed to characterize word-level phonotactic domains in Kaqchikel.