Prosodic licensing of segmental features in Dagbani

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The existence of metrical structures in African languages is a largely neglected subject. Studies that explore the role of metrical structures in the prosodic and segmental phonologies of African languages are relatively few (e.g. Leben 2002; Bickmore 2003; Weidman and Rose 2006; Pearce 2006; Green 2010). What is more, with notable exceptions such as Akinlabi and Urua (2003), these observations are made on Nilotic languages of East Africa. This paper builds on the observation that the vowel distribution of Dagbani (Ghana, Gur) is regulated by prosodic constraints (Hudu 2010).

Hudu observed that [-ATR] vowels are licenced in domains with a minimum of two moras, an observation he uses as the basis to posit the existence of the metrical foot in the language. This paper takes up this observation, demonstrating that prosodic constituency also regulates phonological processes affecting other segmental features in Dagbani, especially processes affecting segmental length and place features. It shows that Dagbani has a weight-sensitive prosodic system with a strictly bimoraic foot licensing phonological processes.

Post-vocalic debuccalisation affects /s, k, g/ in Dagbani. However, the trigger must be within the same prosodic foot as the target. /s/ debuccalisation takes place along with vowel shortening, also regulated by the prosody, (1). In (2), both processes fail. The difference between (1) and (2) is easy to explain from a moraic analysis: each word in (1) has three moras underlyingly. Vowel shortening reduces it to two moras within one foot in which the vowel preceding /s/ triggers debuccalisation. Vowel shortening plays a dual role. It reduces the word to one foot, thereby blocking the surfacing of a de-generate foot, and provides a trigger for debuccalisation. In (2), vowel shortening is not motivated, as it would produce a degenerate foot while not in a position to trigger debuccalisation. Processes that do not change place specifications are not regulated by the prosodic foot. In /wɔ̀gɨ̀dɨ̀-lɪ̂/ --> [(wɔ̀.ʔɨ̀)(ɾɨ̀-lɪ̂)] “giant”, tapping takes place even though the vocalic trigger and the target /d/ are in different feet.

These processes also provide evidence that footing of syllables and moras proceed from left to right, with the head foot being the leftmost. In a word with an odd number of moras, an eligible target of a process will be shielded if it is in the final syllable, (3), unlike words with even number of moras, (4).

Morphological rules and structures interact with prosody, as foot boundaries are aligned with the boundaries of lexical roots and stems. In a root compound word, moras in different roots are not combined within one foot, (5). The same restriction prevents the footing of affixal segments with segments in root morphemes, (6). The analysis is presented within the framework of Optimality Theory. It shows how the interaction of prosodic constraints with constraints on other aspects of Dagbani morphophonology accounts for the role of the prosodic foot as the licenser of these phonological processes.

(1) /bíː-sɨ́/ [(bí-hí)] “child-pl.” /dúːsì/ [(dʊ̀.hɨ̀)] “drive”
(2) (bìː)-(sîm) “hot-ness” (màː)-(sîm) “cold-ness”
(3) /má.sɨ́.gɪ̂/ (má.hɨ́).gɪ̂ *má.(sɨ́.ʔɪ̂) “make wet”
(4) /sàkɨ̀/ (sàʔɨ̀) “agree”
(5) /bí-gá-ŋá/ [bí-(gá-ŋá)] *[(bí-ʔá)-ŋá] “lone child” (*bí-* = child)
(6) /á-náːsɨ́/ [á-(ná.hɨ́)] *[(á-ná) sɨ́] (a- = nominal prefix)

References

Akinlabi, A., and E. Urua. (2002). Foot structure in the Ibibio verb. *Journal of African Languages and Linguistics* 23:119-160.

Bickmore, Lee. 2003. The use of feet to account for binary tone spreading: Evidence from Cilungu. In Rose-Juliet Anyanwu (Ed.), *Stress and Tone - The African Experience,* pp. 23-47. Cologne: Rüdiger Köppe.

Dimmendaal, G. J. (2012). Metrical structures: A neglected property of Nilotic (and other African language families). *Studies in Nilotic Linguistics* 5*:* 1-26.

Green, Christopher R. 2010. Prosodic Phonology in Bamana (Bambara): Syllable Complexity, Metrical Structure, and Tone. Doctoral Dissertation, Indiana University.

Hudu, F. (2010). *Dagbani tongue-root harmony. A formal account with ultrasound investigation*. (Doctoral thesis). UBC.

Leben, William R. 2002. Tonal feet. In Ulrike Gut and Dafydd Gibbon (Eds.), *Proceedings, Typology of African Prosodic Systems* Vol. 1, pp. 27-40. [Bielefeld Occasional Papers in Typology].

Pearce, Mary. 2006. The interaction between metrical structure and tone in Kera. *Phonology* 23: 259-286.

Weidman, Scott, and Sharon Rose. 2006. A foot-based reanalysis of edge-in tonal phenomena in Bambara. In Donald Baumer, David Montero & Michael Scanlon (Eds.), *Proceedings of the 25th West Coast Conference on Formal Linguistics,* pp. 426-434. Somerville, MA: Cascadilla Proceedings Project.