

## Stress and Floating Syllables in Malagasy: Architectural concerns

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A recent proposal regarding the architecture of the phonological module states that the metrical component cannot refer to sub-skeletal segmental/featural content (melody): *Stress Encapsulation (SE)* Rasin 2017a,b. This restrictive hypothesis correctly excludes a whole class of unattested phenomena such as ‘stress the leftmost [–round] vowel’. It also excludes sonority-determined stress, which has come under recent scrutiny (Shih 2016; Rasin 2017b).

Malagasy appears to contradict *SE*. Keenan & Polinsky (1998) (**K&P**) treat Malagasy stress as phonemic because there are some minimal pairs: *tánana* ‘hand’ vs. *tanána* ‘village’. However, Malagasy stress is largely predictable: (a) Malagasy has regular right-aligned penultimate stress: *mandéha* ‘go’ (b) secondary stress falls on every second syllable to the left of the main stress: *lândiházo* ‘cotton’, (c) word-final diphthongs bear stress: *manáo* ‘to do’. Up to this point it can be analysed with right-aligned trochaic feet built on moras: *mah*(<sub>i</sub><sub>μ</sub><sub>ta</sub><sub>μ</sub>) ‘to see’ & *man*(<sub>á</sub><sub>μ</sub><sub>o</sub><sub>μ</sub>) ‘to do’ (Erwin 1996). Additionally, there are three melody-dependent aspects of the stress pattern (where the specific segmental content is implicated in the generalisation/rule that determines stress assignment). Firstly, word-final [e] acts as a regular stress attractor (Rasoloson & Rubino 2005 (**R&R**)): *lehibé* ‘big’ (K&P), *manomé* ‘to give’ (Ramík 2016). Secondly, trisyllabic words ending in the syllables: -tra, -ka, -na regularly have antepenultimate stress. Collectively these are known as ‘weak syllables’ (Erwin 1996) or ‘weak roots’ (K&P): *vóhitra* ‘hill’, *tánana* ‘hand’, *tópaka* ‘broken’. Thirdly, weak roots have penultimate stress if the weak syllable is preceded by the stress attracting [e]: *pokétra* ‘purse/handbag’ (R&R).

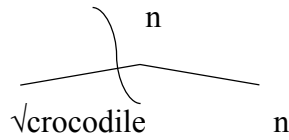
The melodic sensitivity appears to also have an interaction with Malagasy morpho-syntax. Roots ending in weak syllables lose them in reduplication, compounding and enclisis: (a) *antánana* ‘fall into the hands of’ + *mámba* ‘crocodile’ > *antána-mámba* ‘fall into the hands of a cruel person’, (b) *fihina* ‘clutch’ + *mámba* ‘crocodile’ > *fihimámba* ‘refusal to let something go’, (c) *zánaka* ‘child’ + *ko* 1S.GEN *zánako* ‘my child’ (R&R). Erwin (1996) discusses a morphological proposal for the weak syllables that avoids direct reference to melody: ‘weak syllables as ‘stem formatives’’. However, as Erwin notes, this is not correct because there is no way to know which roots receive them: *láva* ‘long’ vs. *lávaka* ‘hole’. Nonetheless, this analysis is similar to R&R, that refers to these as ‘extended roots’ (without further explanation). Erwin (1996) lands on the hypothesis that weak roots are consonant-final and have an epenthetic, non-moraic ‘a’. This analysis can account for their behaviour in stress assignment, but it is not clear how it predicts the deletion pattern of the weak syllables. A melodically-determined extrametricality analysis (with lexical exceptions) may actually be more insightful than this epenthesis account, because extrametricality is (by hypothesis) only possible at word margins. However, all of these analyses violate *SE* (which I’m promoting). Also, independently, it would be preferable to have a solution where: (1a) stress computation is achieved with few/no irregularities, (1b) there are no melody-dependent stress aspects, and (1c) weak-syllable deletion is simultaneously explained.

The analysis presented here achieves these things in the Strict CV framework. It constitutes a radical departure from previous accounts of Malagasy stress. I propose that the weak syllables of Malagasy are not extrametrical, they are extrasyllabic/‘floating’. Although lexically part of their root, weak syllables have no syllable structure position inside their own morpheme. Consequently, their appearance is contingent on their phonological surroundings. If the floating segmental content does not associate to a syllabic position, it is stray erased. Specifically, I propose that Malagasy little *n* (and *v*) are phase heads (cf. Embick & Marantz 2008). The phase is phonologically marked with an empty CV in the phonological string (Scheer 2012) (shown in (2)). This empty CV

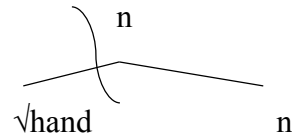
provides the landing site for the floating weak syllable (shown in (3)). Once the string is prepared, stress is computed according to a 3-CV window. Given the window, stress falls on the leftmost V in the window: CV{CVVCV} (4).

(2) Morpho-syntactic structure

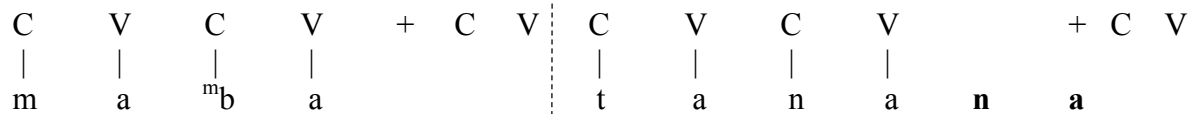
(a) má<sup>m</sup>ba ‘crocodile’



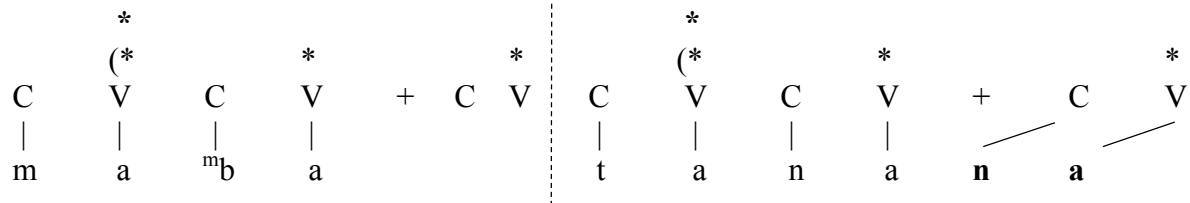
(b) tánana ‘hand’



(3) Phonological structure

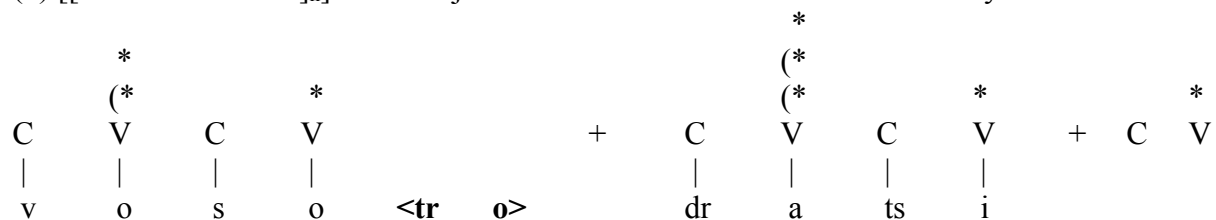


(4) Stress leftmost in window



The diagram in (5) shows the outcome of the derivation of a weak Root<sup>1</sup> + Root<sup>2</sup> compound. The empty CV of the phase is local to Root<sup>2</sup>, effectively erasing the weak syllable.

(5) [[√vosotro + √ratsi]<sub>n</sub>] vosotro ‘joke’ + ratsi ‘bad’ > vòsodràtsi ‘buffonery’



The analysis extends to the genitive and to reduplication, though they also involve intervening syntactic heads that introduce a nasal into the phonology, thereby triggering further mutations (cf. K&P). The window analysis of stress is consistent with the stress attracting properties of ‘e’. As Erwin (1996) discusses, the mid-vowel ‘e’ is underlying a diphthong that merely surfaces as [e]. Because it is complex, the ‘e’ is phonologically bipositional and will often coincide with the site of regular fixed stress: [ka{fè<sup>CV</sup>CV}] ‘coffee’ and [pu{ké<sup>CV</sup>tra}] ‘purse’. Based on analysis of Ramik’s (2016) soundfiles, I will show that this behaviour is largely shared by the other mid-vowel of Malagasy: ‘o’. Though the ‘o’ is lexically rare, occurring only in some loanwords, it nevertheless creates the following structural contrast: [ma{náu<sup>CV</sup>}] manáo ‘to do’ vs. [kaka{ó<sup>CV</sup>CV}] kakaó ‘cocoa’.

This analysis, based on floating melody and a tripartite metrical window, achieves the aims listed in (1a-c) and crucially, given my architectural concerns, it conforms to SE.