Phrase-level prosodic smothering: Evidence from Makonde

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In a recent paper, Bennett, Harizanov, & Henderson (2018, *LI*) (hereafter BHH) present a formal analysis of the idiosyncratic behavior of a subclass of dependent morphemes in (Western) Macedonian and Kaqchikel. They call this "prosodic smothering" whereby an outer morpheme "smothers" the prosodic properties of inner morphemes and formalize it via "vertical subcategorization" (VS), recently extended to English function words in Tyler (to appear, *NELS 2017*). While the better known cases of prosodic subcategorization involve specifying prosodic properties of a sister, e.g. [X $_{\omega}$[…]], VS specifies properties of the mother which immediately dominates it, e.g. $_{\omega}$[X […]]. In this paper we have two goals. First, we show that prosodic smothering is not limited to affixes/clitics and phonological words (ω) as in BHH, but also occurs at the phonological phrase (φ) level. Second, we show that the edge of the dominating prosodic category under VS must be local to the triggering morpheme and consequently cannot smother an outward morpheme Y, i.e. * $_{\omega}$[Y X […]]. Since this fact is not captured under BHH's proposal, we modify VS frames by introducing indexed prosodic bracketing, e.g. $_{\omega}$[$_i$ X$_i$ […]]$_i$.

The evidence we present comes from a comparative analysis of seven dialects of Makonde, a Bantu language whose different varieties are spoken in Tanzania and Mozambique. The issue concerns triggers and non-triggers of penultimate lengthening, an areal trend among Bantu languages that have lost the Proto-Bantu vowel length contrast (Hyman 2013). As seen in the forms in (1) from Zanzibar Makonde (Manus 2003, 2018), the penultimate vowel of words in isolation is automatically lengthened in all dialects, constituting a phonological phrase (φ):

(1) $_{\varphi}$[síl**óó**lo] 'mirror' $_{\varphi}$[kúlúm**úú**la] 'to cut' $_{\varphi}$[kúlúmúl**áá**nga] 'to cut into small pieces'

Phonological phrasing of nouns depends on the following modifier. The examples in (2) show that the length persists if a noun is followed by an adjective or numeral, while those in (3) show that penultimate length cannot occur on the head noun if it is immediately followed by a demonstrative. As indicated to the right of the examples, lengthening only affects the penultimate vowel of the phonological phrase. Head nouns are passive and all behave identically.

(2) vil**oô**ngo víkúm**eê**ne 'big pots' $_{\varphi}$[N] $_{\varphi}$[ADJ]
vil**oô**ngo viv**ii**li 'two pots' $_{\varphi}$[N] $_{\varphi}$[NUM]

(3) vílóngó av**ii**lá 'those pots' $_{\varphi}$[N DEM]

These Zanzibar examples are but one such case found in the Makonde dialects whose properties we have surveyed within 27 modification contexts. We present a condensed version in the table:

Source	Dialect	POSS	DEM	ADJ	NUM
Leach (2010)	*Plateau Shimakonde*	+	±	-	-
Devos (2004)	*Makwe*	+	±	-	-
Manus (2018)	*Zanzibar Simakonde*	+	+	-	-
Kraal (2005)	*Chinnima*	+	+	-	-
Liphola (2001)	*Coastal Shimakonde*	+	+	+	-
Odden (1990a,b)	*Chimaraba*	+	+	+	+
Odden (1990c)	*Chimahuta*	+	+	+	+

Although the dialects differ in detail, there is a ranking of modifiers POSS >> DEM >> ADJ >> NUM in terms of their ability to join with the head noun in forming a single φ. As in BHH, it is not fully possible to predict the prosodic behavior of modifiers, necessitating VS frames $_{\varphi}$[… MOD] for the triggering modifiers. We will show from the full set of modificational contexts that triggers do not have a uniform semantic or syntactic profile (e.g. being X°'s or XP's), complicating any straightforward analysis via Match Theory (Selkirk 2011, among others).

The point of interest (and overlap with BHH's prosodic smothering) comes from examples such as (4) which show that when a (separately phrasing) adjective or numeral intervenes between the head noun and a (head-incorporating) demonstrative, the entire sequence forms a single φ:

(4)	a.	vílóngó víkúméné av**ii**lá	'those big pots'	φ[N ADJ DEM]
	b.	vílóngó vívílí av**ii**lá	'those two pots'	φ[N NUM DEM]
	c.	vílóngó víkúméné vívílí av**ii**lá	'those two big pots'	φ[N ADJ NUM DEM]

Since the DEM must phrase with the head noun, an intervening ADJ and/or NUM now must be incorporated into the same φ. In a parallel example of such "prosodic entrapment" from Coastal Shimakonde, NUM does not form a φ with N, but does when there is an outer ADJ (Liphola 2001):

(5)	a.	ma-pap**áa**ja mat**aá**tu	'three papayas'	φ[N] φ[NUM]
	b.	má-pápájá mángúlúg**uu**ma	'round papayas'	φ[N ADJ]
	c.	má-pápájá mátátú mángúlúg**uu**ma	'three round papayas'	φ[N NUM ADJ]

Based on these examples and those in BHH, we claim that prosodic smothering only targets morphosyntactically "inward" structure, specifically heads (and interveners); "outward" structure such as outer modifiers is not targeted. We schematize this in (6), showing that an outer trigger smothers inner structure (a-b), but that an inner trigger can only smother the head (c). If both morphemes are not triggers, then default, language-dependent prosodic properties apply (d).

(6)	LEXHEAD	INNER	OUTER	
a.	φ[N	+	+]	Outer smothers (2 triggers)
b.	φ[N	-	+]	Outer smothers (1 trigger)
c.i.	φ[N	+]	φ[-]	Inner smothers head only
c.ii.	* φ[N	+	-]	No "outward smothering"
c.iii.	* φ[N]	φ[+	-]	
d.	φ[N]	φ[-]	φ[-]	Default properties

The gaps in (c.ii.-c.iii.) are not guaranteed under BHH's proposal. For example, the Macedonian clitics *što* and *ne* have the same subcategorization frame ω-min[X […]]. When both triggers occur in a sequence ω-min[ˈ**što** ne zel], BHH argue that the single ω-min domain "satisf[ies] the selectional requirements of both triggering clitics simultaneously", even though *ne* is non-local to the prosodic edge. This therefore predicts that equivalent sequences involving an inner trigger and an outer *non*-trigger of the shape * φ[N + -] would also satisfy the inner's VS frame. As stated, this pattern is unattested and we therefore take it to be a pathological predication of BHH.

In response, we modify the structure of VS frames to include indexed brackets e.g. $\varphi[_i \ \ldots \ \text{DEM}_i \ ]_i$, which require pre-specified alignment between co-indexed prosodic boundaries and morphemes, thus ruling out patterns of the shape * $\varphi[_i \ \ldots \ X_i \ Y \ ]_i$ (* φ[N + -] above). This also allows us to eliminate two structures that equally satisfy the VS frame: recursion (e.g. φ[φ[Y] X]) and sisterhood (e.g. φ[Y] φ[X]). Such cases forced BHH to introduce other constraints, e.g. ALIGN-R(ω,LEX), in addition to the VS-specific constraints. With indexed brackets we can eliminate both of these types by banning boundaries of the same category between co-indexed brackets, i.e. * $\varphi[_i \ \varphi[_j \ Y \ ]_j \ X_i \ ]_i$ and * $\varphi[_i \ Y]_j \ \varphi[_j \ X_i \ ]_i$. Further, we show that the opposite-side indexed bracket must align to the edgemost position of relevant extended projection XP (KP~DP~NP in the nominal domain) and not strictly the lexical head, illustrated in Coastal Makonde where nouns in a φ[N_1 and N_2 ADJ_2] all phrase together due to ADJ_2, even though ADJ_2 only scopes over and agrees with N_2 (Liphola 2000). Finally, we demonstrate that our proposal naturally extends to cases of prosodic entrapment in the assignment of constructional tonal melodies in the Dogon family (McPherson 2014, McPherson & Heath 2016) and Kalabari (Ijoid - Harry & Hyman 2014).