

UC Berkeley

Proceedings of the Annual Meeting of the Berkeley Linguistics Society

Title

The Status of the Macrostem in Reduplication in Ndebele and Zulu

Permalink

<https://escholarship.org/uc/item/86g6x0xb>

Journal

Proceedings of the Annual Meeting of the Berkeley Linguistics Society, 37(37)

ISSN

2377-1666

Author

Cook, Toni

Publication Date

2013

Peer reviewed

The status of the macrostem in reduplication in Ndebele and Zulu

Author(s): Toni Cook

Proceedings of the 37th Annual Meeting of the Berkeley Linguistics Society (2013), pp. 46-60

Editors: Chundra Cathcart, I-Hsuan Chen, Greg Finley, Shinae Kang, Clare S. Sandy, and Elise Stickles

Please contact BLS regarding any further use of this work. BLS retains copyright for both print and screen forms of the publication. BLS may be contacted via <http://linguistics.berkeley.edu/bls/>.

The Annual Proceedings of the Berkeley Linguistics Society is published online via [eLanguage](#), the Linguistic Society of America's digital publishing platform.

The Status of the Macrostem in Reduplication in Ndebele and Zulu*

TONI COOK

University of Pennsylvania

Introduction

In Bantu languages, the Macrostem is the portion of the verb complex that begins with the object marker (if present) and extends rightward to the end of the complex. Along with the verb stem, it has been seen as a privileged domain for a variety of processes, reduplication among them. In the mutually intelligible Nguni languages Zulu and Ndebele, reduplication is argued to be restricted to draw exclusively on non-inflectional Macrostem material (Downing 2001, 2009; Hyman et al. 2009; Sibanda 2004). However, data presented here show that, under certain conditions, inflectional non-Macrostem material may be included in the reduplicant as well. Crucially, all such material comes at the left edge of the stem; the requirement that inflectional material *within* the Macrostem be excluded from the domain of reduplication goes unviolated. Additionally, when material at the left edge is included, the reduplicant+base complex no longer behaves as a single tonal domain, challenging the notion that RED+base is a compound verb stem (Downing 2003, 2006; Inkelas and Zoll 2005).

1 The Macrostem and the Domain of Reduplication in Zulu and Ndebele

The examples in (1) show that the Macrostem begins with the initial segment of the verb root, or object marker if one is present, and continues to the end of the verb complex. It is bold below, the constructions are grammatical in both Zulu and Ndebele:

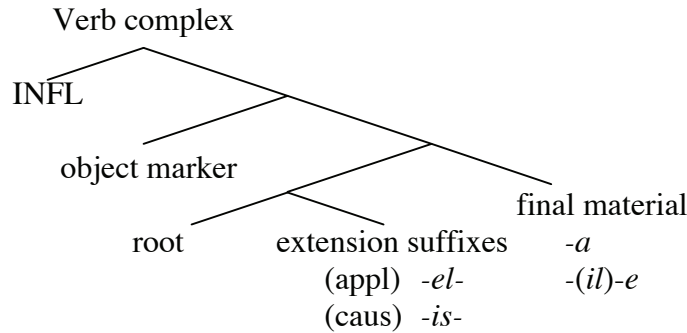
- (1) a. i. *u-ya-sí-théng-a* ‘You are buying it’

* Thanks to Nosipho Khumalo for providing the Zulu judgments described in this paper, and for generously sharing her language with me.

- | | | |
|-------|------------------------|--------------------|
| ii. | <i>u-ya-théng-a</i> | ‘You are shopping’ |
| b. i. | <i>u-sí-théng-il-e</i> | ‘You bought it’ |
| ii. | <i>u-théng-il-e</i> | ‘You shopped’ |

According to Downing (2001), the Macrostem encompasses everything from (and inclusive of) the object marker to the final vowel— an *-a* or *-e* in (1). This conception of the Macrostem has its origins in Kisseberth (1984), but the key aspect of the Macrostem is that it is part of a hierarchical, binary structure— a sub-part of the full verb complex whose internal structure is outlined in Meeussen (1967) and detailed in Myers (1987), Hyman and Mtenje (1999), Downing (2001) and others. This structure is shown below:

(2) Internal Structure of Bantu Verbs



We see in (2) that the Macrostem neatly matches with a portion of the morpho-syntactic structure of the full verb complex (everything below INFL). When the verb root is fully syllabic (minimally CVC), such as *-theng-* ‘buy’ in (1), reduplication must pull exclusively from Macrostem material in both Zulu and Ndebele. In both languages, the reduplicant is a disyllabic constituent that is prefixed to the verb stem, with the meaning that the action denoted by the verb is performed carelessly and/or without skill. For CVC roots, the object marker is excluded, and for roots of this size and bigger, reduplication in these languages is nearly identical (tone marked is underlying, following convention, the RED+base complex is bracketed):

- | | | | | | |
|-----|----|-----|------------------------|---|----------------------------------|
| (3) | a. | i. | <i>u-ya-sí-théng-a</i> | → | <i>u-ya-sí-[théng-a+theng-a]</i> |
| | | ii. | <i>u-ya-théng-a</i> | → | <i>u-ya-[théng-a+theng-a]</i> |
| | b. | i. | <i>u-sí-théng-il-e</i> | → | <i>u-sí-[théng-a+théng-il-e]</i> |
| | | ii. | <i>u-théng-il-e</i> | → | <i>u-[théng-a+theng-il-e]</i> |

The first requirement on the reduplicant is that it must fully parse the root from L → R; we assume that the RED morpheme is a bare [σσ] template. After the root *-theng-* is parsed into the reduplicant, there remains one vowel slot that needs to be

filled, since all non-word initial syllables in Ndebele and Zulu must be CV.

The final vowel on the reduplicant is the same for all the constructions in (3); it is an *-a* throughout. So, for the examples in (b), the perfective suffix, *-il-e*, is barred from appearing in the reduplicant. What we see instead is the default verbal final vowel, *-a* (Mutaka and Hyman 1993, Downing 1997), which is argued to essentially mark the reduplicant as an instance of a verb stem, lacking any inflectional features. In other analyses of Ndebele reduplication (Hyman, Inkelas, & Sibanda 2009, Downing 2001), this is due to a constraint penalizing the inclusion of inflectional material (like the perfective suffix) in RED. Suffixal inflectional material (which is part of the Macrostem), is barred from RED in both Ndebele and Zulu.

2 Reduplication of Consonantal Roots

When we turn to sub-minimal roots (those with a prosodic shape of C or VC), significant differences emerge between the reduplicative patterns in these two languages; we'll look first at roots which consist of a sole consonantal segment. If the root + default final *-a* fails to satisfy disyllabicity in Ndebele, an empty augmentative morpheme *-yi-* is called on to bring the reduplicant up to two syllables. For a verb like *-dl-* 'eat':

- (4) a. *u-dl-a* → *u-[dl-a-yi+dl-a]* ‘you eat’ (Ndebele)
 * *u-[yi-dl-a+dl-a]* (Ndebele)
 * *[u-dl-a+u-dl-a]* (Ndebele)

In the Zulu dialect described here, an acceptable reduplication does not exist:

- b. *u-dl-a* → **u-[dl-a-yi+dl-a]* (Zulu)
 **[u-dl-a+u-dl-a]* (Zulu)

What (4) shows is that for verb complexes consisting of a consonantal root and the bare minimum of additional material (a subject marker and final vowel), reduplication is impossible in Zulu, while in Ndebele the empty morph *-yi-* is permitted to appear in the reduplicant, and render it disyllabic. Since *-yi-* does not have any morphosyntactic affiliation, it does not come from outside of (nor, strictly speaking, from within) the Macrostem.

We do see *yi-* in Zulu however, in cases where the full verb complex (rather than some sub-constituent like RED) is sub-minimal; this happens with the imperative of sub-minimal roots:

- (5) *yi-dl-a* **dl-a* (same judgments for both Zulu and Ndebele)
 ‘eat!’

The difference, which seems to be an innovation in this dialect of Zulu (since Zulu reduplicants containing *-yi-* are documented in Doke 1943), is that *-yi-* may

not appear word-internally in Zulu. In Doke (1943), based on a version first published in 1927, he presents some reduplicated forms, dubbed “the diminutive” (p.149):

- (6) *-fa* ‘die’ → *-fayifa* ‘feel unwell’

If the verb stem contains an object marker (part of the Macrostem), it may be pulled in to the reduplicant to bring it up to the two syllable requirement. In Ndebele, the *-yi-* variant is also permitted:¹

- (7) *u-zi-dl-a* → a. *u-ya-[zi-dl-a+zi-dl-a]* ‘you eat them’ (Z&N)
 b.**u-ya-[zi-dl-a+dl-a]* (Z&N)
 c. *u-ya-zi-[dl-a-yi+dl-a]* (N only)

In both Zulu and Ndebele, object markers can be incorporated into reduplicants (7), and we saw in (4) that with a verb complex which consists of the bare minimum of material, there is no way to achieve disyllabicity in the Zulu reduplicant, whereas in Ndebele, *-yi-* can be called on to save the construction.

3 Asymmetries in the Interaction of Reduplication and Long Form Verb Morphology

The common thread between the two languages regarding reduplication of consonantal roots is that a (syllabic) subject marker is not available for prosodic circumscription into the reduplicant. However, other prefixal material that is outside the Macrostem (i.e. between the subject marker and object marker) may be pulled into the reduplicant in Zulu, but not in Ndebele.

- (8) a. i. *u-ya-dl-á* ‘you’re eating’ → *u-[**ya**-dl-a+ya-dl-a]* (Z)
 ii. *u-ya-dl-á* → **u-ya-[dl-a-**yi**+dl-a]* (Z)
 *u-ya-[dl-a-**yi**+dl-a]* (N)
 u-[ya**-dl-a+(ya)-dl-a]* (N)
 b. i. *si-ya-m-a* ‘we’re standing’ → *si-[**ya**-m-a+ya-m-a]* (Z)
 ii. *si-ya-m-a* → **si-ya-[m-a-**yi**+m-a]* (Z)
 *si-ya-[m-a-**yi**+m-a]* (N)
 si-[ya**-m-a+(ya)-m-a]* (N)

For the Zulu examples in (a), the present long form/focus marker *-ya-* may be recruited into the reduplicant, but *-yi-* is not allowed – the mirror opposite of the pattern we see in Ndebele. The exact nature of this long form morphology has

¹ When a verb contains an object marker (*-zi-*), the verb must appear in its 'long form' and in the present affirmative, the *-ya-* is how the long form, or non-phrase final version, is marked.

been discussed in detail elsewhere (van der Spuy 1993, Buell 2007); some have claimed it is an aspectual distinction (Botne and Kershner 2000), and others that it is a matter of focus— that when no other element is focused, default focus is assigned to the verb.

Regardless of any semantic or TAM effects, a verb receiving long form morphology is most closely tied to the syntactic frame in which the verb appears. If the verb is final in some XP constituent, long-form, also called disjunctive, morphology is required. The *-ya-* morpheme that marks present verb forms as ‘long’ is outside the Macrostem; it occurs when the verb is *not* followed by a (non-object-marked) complement, or an adjunct belonging to a particular class.

- (9) a. *u-ya-dl-á* “You are eating” vs. *u-dl-á kahle* “... well.”
 b. *u-ya-fúnd-a* “You are reading” vs. *u-fúnd-a kahle* “... well.”

However, in the recent past (perfective), long form marking is realized by the morpheme *-il-* which occurs between the verb root and the final vowel, an *-e* for this tense (as seen in (1) and (3)).

- (10) a. *u-dl-il-e* “You ate” vs. *u-dl-e kahle* “... well.”
 b. *u-fund-il-e* “You read” vs. *u-fúnd-e kahle* “... well”

It seems then that *-ya-* and *-il-* are serving the same function; they mark long form morphology signaling that the verb is final in an XP; *-ya-* is the long form marker for the present, and *-il-* for the recent past.

Since we saw that *-ya-* can be included in reduplications of sub-minimal roots, it would be logical to expect the same of *-il-*, in Zulu at least. But, this isn’t the case— *-il-* is never permitted on reduplicants. Just as it was unacceptable with reduplications of the fully CVC root *-theng-* in (3), it is equally bad with a sub-minimal consonantal root like *-dl-*.

- (11) a. *u-dl-il-e* “you ate” → i. **u[dl-il-e+dl-il-e]* (Z & N)
 ii. **[u-dl-i+u-dl-il-e]* (Z & N)
 iii. *u-[dl-a-yi+dl-il-e]* (N)
 reduplication is impossible (Z)

While both languages prioritize the Macrostem in reduplication, Zulu “opts” to go to prefixal non-Macrostem material rather than recruit Macrostem material at the right edge of the construction.

Given that *-ya-* and *-il-* are both morphemes that mark long form verbs, indicating that they are final in some XP, we may presume that these morphemes are introduced at the same point in the derivation and should be equally accessible for prosodic circumscription into the reduplicant. The constraint *INFLECTIONAL which is used in work by Downing, Hyman, Inkelas, and Sibanda should rule out

-ya- in the reduplicant by the same token that it rules out -il-. The grammaticality of Zulu reduplications containing -ya- shows that instead of penalizing the inclusion of “inflectional” morphemes, we need to instead formulate an analysis that addresses the question of why material at the left edge is more accessible than material at the right.

4 Reduplication of VC Roots

The behavior of the other class of sub-minimal roots, those with a prosodic shape of VC, is in many ways similar to roots consisting of a single consonantal segment. In Ndebele C and VC roots are alike in excluding any Macrostem material from the reduplicant, meaning that nothing to the left of the object marker is ever permitted in. This contrasts with how VC roots behave in Zulu, where they show more freedom than their consonantal counterparts in permitting non-Macrostem material into reduplications. The fact that they *do* behave differently is interesting, seeing that the initial V in VC roots has been argued to be extra-metrical, so we would predict that the two types of sub-minimal roots would show identical patterns (Downing 1998).

The differences between Zulu and Ndebele regarding patterns of reduplication in VC roots is, in some ways, similar to what we observed for consonantal roots, but not identical. This shows that the V in VC roots is not extra-prosodic (or at least, not extra-prosodic at every level of phonological processes), since certain reduplications that were impossible with C (consonantal) roots are acceptable with VC roots. We saw in (4) that a syllabic subject marker may not be pulled into the reduplicant, but subject markers that occur before vowel-initial roots become glides, and may be recruited to fill out the [σσ] template in Zulu. In Ndebele, a y- is used to break up the vowel hiatus that would otherwise obtain between the final vowel of the reduplicant and the initial vowel of the root (Sibanda, 2004), a strategy that is disallowed in Zulu.²

- | | | | | | | |
|---------|-----------------|---|----------------|-----|----------------------------|------------|
| (12) a. | <i>u-enz-a</i> | → | <i>w-enz-a</i> | i. | [<i>w-enz-a+w-enz-a</i>] | (✓ Z, * N) |
| | ‘you make...’ | | | ii. | <i>w-[enz-a+y-enz-a]</i> | (* Z, ✓ N) |
| b. | <i>sí-akh-a</i> | → | <i>s-akh-a</i> | i. | [<i>s-akh-a+s-akh-a</i>] | (✓ Z, * N) |
| | ‘we build...’ | | | ii. | <i>s-[akh-a+y-akh-a]</i> | (* Z, ✓ N) |

However, it’s important to note that in (12), the contrast is not in the reduplicant (the lefthand constituent), but rather on the base. So, even in constructions where it is not appearing in RED per se, -yi- may not appear verb-internally in Zulu.

As was the case with the absence of -yi-, the lack of y- word-internally appears innovative (or dialectal) as well, as Doke (1943:150) gives:

² In the closely related and mutually intelligible language, Swati, a glided subject marker may also be included in reduplication (Hyman 2009).

- (13) a. *-ona* ‘sin’ → *-onayona* ‘sin somewhat’
 -onawona
and from Downing (2009) on Zulu (her ex. 3c):
 b. *uk-os-a* ‘to roast’ → *uk-[os-a+y-os-a]*

The bracketings given in (12) are based on the language in which the construction is grammatical. When morphemes to the left of the verb stem are pulled in to the reduplicant, we have seen that they occur on both the reduplicant and the base (with object markers like *-zi-* in both languages, and with the long-form marker *-ya-* in Zulu). So, it is reasonable to assume that when the subject marker occurs on the base, as it does in the grammatical Zulu examples, it is on the reduplicant as well. Conversely, in the grammatical Ndebele examples, from which the subject marker is excluded, we can assume that the reduplicant begins with the initial segment of the base, a vowel, rather than the non-vocalic subject marker.

5 The Significance of Including Non-Macrostem Prefixal Material in the Reduplicant

The Ndebele data discussed in this paper have been discussed and analyzed elsewhere, but what do the new data from Zulu add to the picture of Nguni reduplication? While both languages prioritize the Macrostem in reduplication, Zulu “opts” to go to prefixal non-Macrostem material rather than recruit Macrostem material at the right edge of the construction. We see this in (11) with consonantal roots, and not surprisingly, the pattern of excluding material from the perfective suffix from the reduplicant is also found with vowel-initial sub-minimal roots (VC):

- (14) a. *u-enz-il-e* i. $\rightarrow [w-enz-a+w-enz-il-e]$ * $[w-enz-i+w-enz-il-e]$ Z
 u-enz-il-e ii. $\rightarrow w-[enz-a+y-enz-il-e]$ * $w-[enz-i+y-enz-il-e]$ Nd
 ‘you made’

We saw in (8), with the availability of *-ya-* to be included in Zulu reduplicants, that labeling a morpheme as inflectional is not sufficient to explain the data for Zulu. The fact that (glided) subject markers may be included as well is an indication that a particular morpheme being “inflectional” is not the deciding factor in determining whether or not it may be included in the domain of reduplication.

Additionally, the distinction between glided and vocalic subject markers, i.e. the former may be included in Zulu reduplications while the latter may not, shows that the underlying status of morphemes is not alone responsible for whether or not a particular piece of the verb complex may be included in the reduplicant. For instance, the status of the 2nd singular subject marker *u-*, vis à vis reduplication, is dependent on the prosodic structure of the verb stem that follows. If it is conso-

nantal, *-dla* ‘eat’, *-ma* ‘stand’, *-fa* ‘die’, then the *u-* subject marker is not allowed within the domain of reduplication, and reduplication is in fact impossible. However, if the stem is sub-minimal but vowel-initial *-enza* ‘do’, *-akha* ‘build’, *-ehla* ‘descend’ then the *u-* subject marker (which becomes a *w-* glide when in hiatus with another vowel) is permitted and reduplication goes through.

With *-ya-*, object markers, and glided subject markers, we have seen that what seems to matter is not whether a morpheme is inflectional, but on what side of the structure it occurs. If it is to the left of the verb root, it is permitted into the reduplicant, but if to the right of the root, it is barred.³

(15) Macrostem material and reduplication in Zulu & Ndebele

	Zulu	Ndebele
Macrostem, non-inflectional	✓	✓
Macrostem, suffixal inflectional	*	*
non-Macrostem, prefixal inflectional	✓	*

6 The Macrostem, Reduplication, and Domains within the Nguni Verb

If Macrostem constituency can be violated in Zulu to include prefixal, non-Macrostem inflectional material (as in the last row in the table above), what is the basis for recognizing the Macrostem as a constituent in the first place?

In the Nguni languages (a family of closely related and mutually intelligible Southern Bantu languages which consists of Xhosa and Swati along with Ndebele and Zulu), the Macrostem is a domain relevant for tonal spreading. It has been shown that a high tone from within the Macrostem will spread to the antepenultimate syllable of the Macrostem, which is basically just the antepenultimate syllable of the full verb complex (Khumalo 1987 on Zulu).

- (16) a. i. *u-ya-dóndólázela* ‘you are walking with a cane’
and when it combines with a high-toned subject marker:
b. ii. *bá-yá-dóndólázela* ‘they are walking with a cane’

The reduplicant is argued to form a tonal domain with the base, i.e. it is part of the Macrostem tonal domain (Downing 2001, Sibanda 2004). For CVC roots, the fact that the RED+base complex forms a tonal domain independent of prefixal material doesn’t interact with the tonal specification of prefixal material, since such morphemes are outside the domain of reduplication for fully syllabic and larger roots. For Ndebele and Zulu, then, we have:

³ More accurately, to the right of the “extended root” (Odden 1996), the causative *-is-* and applicative *-el-* are allowed in the reduplicant (if room in the template remains once root material proper is exhausted).

- (17) *u-ya-théng-a* → *u-ya-[théng-á+theng-a]*
 ‘you are shopping’

The question that then arises is, what if a low-toned prefixal morpheme (like *-ya-*) is pulled in to the reduplicant in order to satisfy disyllabicity?

There are several different hypotheses we might formulate regarding what we predict to see in a reduplicated form with the input morphemes: *u*, *ya*, *dl-á*.⁴ Will the high tone of the root ‘scope over’ the Macrostem and appear on the initial *-ya-*? Is tone assigned prior or subsequent to reduplication? What we find is:

- (18) a. *u-ya-dlá* → *u-[ya-dl-á+yá-dl-a]*
 contrast with a low-toned root:
 b. *u-ya-akh* → *u-[y-akh-a+y-akh-a]*

In (18a) the first occurrence of *-ya-* is realized with a low tone— since both the morpheme itself and the preceding subject marker are lexically toneless, this is not surprising. Neither is it a surprise that the second occurrence of *-ya-* bears a high tone, spreading from the high-toned verb root *-dlá* (following the rule of local tone spread detailed in Downing 1990). From (18), it looks like tone association must happen subsequent to reduplication, otherwise we would expect both occurrences of *-ya-* to surface with low tone.

Since the data in (18) behave largely in accordance with our expectations, it may be more fruitful to examine examples where a high-toned prefix (rather than a low-toned one like *-ya-*) is pulled into the reduplicant. In non-reduplicated forms, if the high-toned progressive prefix *-sá-* immediately precedes the verb root, the high does *not* spread onto the root, apparently respecting the boundary that blocks high tones from spreading from prefixal material into the Macrostem domain. The data from *non*-reduplicated forms lend empirical justification to the Macrostem as a meaningful morphophonological constituent in the Nguni verb complex.

- (19) *u-sá-phek-a* ‘you are still cooking’

However, whatever force is keeping the H from *-sá-* in non-reduplicated forms from spreading to the root is not in effect in reduplication (the root *-lwa* ‘fight’ is low-toned).

- (20) *u-[sá-lwá+sá-lwa]* ‘you are still doing a bad job of fighting’

⁴ A high tone on a verb root typically doesn’t surface on the final syllable. However, with sub-syllabic consonantal roots, the only TBU available is the final vowel, so in such cases, the final vowel will bear a high tone.

What we see in (18) is simply that low-toned prefixal morphemes are subject to rightward high tone spreading, the contrast between (19) and (20) shows that pulling a morpheme into the reduplicant affects whether its tone may spread or not. In (19), when *-sá-* is part of the chunk of prefixal morphemes to the left of the Macrostem, its H is blocked from spreading to the verb root, but when the morpheme is part of the reduplicant, the H is permitted to spread to the penult. While the distinction between Macrostem and non-Macrostem material appears to be valid for non-reduplicated forms, it is erased under reduplication.

While the H carried by *-sá-* must be marked lexically— and must be present throughout the derivation (though not necessarily realized)— the rules governing tonal spreading must apply late, after the establishment of the relevant morphophonological domains. The data put forward here are not intended to argue that the Macrostem is an ‘ad hoc’ constituent, but rather to question its relevance in reduplication. The key points here are concerned with issues of morphological and phonological affiliation, and the flexibility of the boundaries between certain domains in the verb.

A related question has to do with the implications of these data for the theory that the RED+base complex is a compound verb stem (first proposed in Downing 2003, and taken up as well in Inkelas & Zoll 2005). The example in (20) shows that, tonally, the RED+base complex behaves like a single verb stem, in that the high tone of the first syllable is permitted to spread to the penult of the full form. However, the underlying morphological affiliation of *-sá-* is outside the verb stem, and it seems somehow misleading to characterize such prefixal material as part of the verb stem. A more accurate description of the phenomenon is that the morphophonological boundary (likely that of the Macrostem) that blocks the H of *-sá-* from spreading onto the stem is voided under reduplication. In other words, the Macrostem and reduplication domains cannot co-exist in reduplications of sub-minimal roots.

7 The Left-Right Asymmetry in Penalizing Inclusion of Inflectional Material in Reduplication

We have seen that, in many cases, identifying the domain of reduplication as the (Macro)stem combined with a constraint *INFL picks out the right constituent to undergo reduplication. *INFL is never violated at the right edge— the perfective ending *-il-e* is never allowed in the reduplicant, but on the left edge, a number of inflectional morphemes may be included in reduplications of sub-minimal roots (long form present *-ya-*, progressive *-sá-*, and glided subject markers). Focusing on Bantu, Hyman (2008) gives a number of examples where the left edge of a phonological object is “stronger” than the right edge; that is, more clearly demarcated, and able serve as a locus of contrasts that are either neutralized or not permitted in later syllables.

There seem to then be at least two different ways of analyzing the mismatch in the requirement that inflectional morphemes be excluded from the right, but may be permitted on the left: 1) the asymmetry is due to the underlying morphosyntactic structure (Embick 2010), i.e. the (lefthand) morphemes that may be pulled into the reduplicant are merged earlier than those which are excluded (on the right), or 2) the asymmetry is due to the phonology prioritizing RED-base alignment on the left edge.

Both analyses have some appealing aspects— the structural account forces us to rethink what the constraint *INFLECTIONAL really means, and the more surface-oriented account gives another example of left » right asymmetries in Bantu morphophonology. Although the Bantu verb complex typically begins with a subject marker, the left in “left » right asymmetries” does not refer to the subject marker, but rather to the left edge of the stem.

In Zulu in particular, one such example comes from palatalization in the passive, first mentioned in Doke, but analyzed more recently in Beckman (1993). When the passive suffix *-(i)w-* is added to a verb stem, all labials will palatalize, except if the labial is the first segment in the root (or the first consonant in the root, in the case of vowel-initial roots):

- (21) a. *-saba* → *-saj-wa*
 ‘to be afraid’ ‘to be feared’
 b. *-phupha* → *-phutsh-wa*
 ‘to dream’ ‘to be dreamed’

In (b), we see that the *ph* (an aspirated [p^h]) which occurs in the C₂ position in the stem palatalizes to [č], but when this segment is in the C₁ slot, it is immune. The failure of stem-initial segments to undergo palatalization is a classic example of the importance of the left boundary of the stem in Zulu. The left edge being stronger or more important than the right may be related to why perfect alignment on the left is necessary, but correspondence mismatches may be permitted on the right, or in the C₂ position of the reduplicant and the base.

8 The Macrostem vs. the Stem = Prosodic vs. Segmental Phonology?

We have seen that the domain of the Macrostem —to the extent that it is a valid and meaningful domain— is principally relevant for tonal spreading. For non-reduplicated constructions, where a high tone from a prefixal morpheme, like *-sá-* (in (20)), is not permitted to spread into the stem/Macrostem; a high originating *within* the Macrostem may spread to the penult or antepenult of the Macrostem, depending on the number of syllables. (22a) shows a verb complex where all morphemes, including the verb root, are low-toned; in (22b), a high-toned object marker is added. In both, the Macrostem is bracketed.

- (22) a. *u-ya-[bhobhoz-a]*
 ‘you are piercing’
 b. *u-ya-[zǐ-bhóbhöz-a]*
 ‘you are piercing them’

This example shows that a high tone from an object marker may spread through the verb stem, while highs from prefixal, non-Macrostem morphemes are blocked from doing so. Since the Macrostem appears to interact with the tonal properties of the language, the role it plays is concerned with the prosodic phonology of the language.

If the Macrostem was relevant for Zulu’s segmental phonology, we would predict that it would interact with the application of the palatalization rule that affects labials in the passive. Since stem-initial labials are not subject to palatalization, if the Macrostem interacted with processes in the segmental phonology, we could hypothesize that adding a labial object marker would then render this segment initial in the domain of palatalization, and a root-initial labial would then be subject to palatalization. However, this is not the case; root-/stem-initial labials may never palatalize, regardless of the features of the preceding object marker:

- (23) a. *-bamb-a* → *-banj-w-a*
 ‘catch’ ‘be caught’
 b. *-bamb-el-a* → *-banj-el-w-a*⁵
 ‘catch for’ ‘be caught for’
 c. *-mu-bamb-el-a* → i. *-mu-banj-el-w-a*
 ‘catch for him’ ‘be caught for him’
 ii.* *-mu-janj-el-w-a*

As (ii) in (23c) shows, having a labial object marker does not make a root-initial labial available for palatalization. The relevant domain for palatalization in the passive is that stem; the Macrostem is not relevant for the application of this phonological rule.

Preliminarily, it seems like the Macrostem is a meaningful constituent for processes that are more closely tied to prosodic, rather than segmental, aspects of Zulu’s phonology. It plays a role in H-tone spreading, and in reduplication (though arguably not any more meaningful a role than non-Macrostem prefixal morphemes) which is linked with a bare prosodic template [σσ]. It contrasts with the stem proper, a constituent that begins with the first segment of the root, and excludes any object marking. The stem is relevant for segmental processes, like the palatalization that takes place when the passive suffix attaches, but the stem is also part of the Macrostem domain for the spreading of H-tones from the object

⁵ It is not possible to add an object marker to a passive without also adding an extension suffix (causative *-is-* or applicative *-el-*) to introduce another argument.

marker. Rather than simply claim that one is the domain for tone spreading and the other for segmental processes, the distinction between the two may be that palatalization happens before the object marker is introduced, so it's not a question of overlapping domains, but of correctly ordering the processes at work.

9 Conclusion

Although the Macrostem is prioritized in reduplication in both Ndebele and Zulu, Ndebele reduplicants are permitted to pull material only from the Macrostem, while in Zulu, the unavailability of the augmentative morpheme *-yi-* verb-internally forces the reduplicant to go up to prefixal, non-Macrostem material in order to fill out the $[\sigma\sigma]$ template. For both Ndebele and Zulu, suffixal inflectional Macrostem material is barred from appearing in the reduplicant, but the prefixal morphemes Zulu permits are inflectional, so the constraint *INFLECTIONAL does not account for the full range of Zulu data.

The tonal behavior of Zulu reduplications compared with non-reduplicated forms shows that prefixal morphemes can lose their “prefixal” affiliation by virtue of being pulled into RED. The data and analysis presented here are a first attempt at addressing important questions regarding the derivational timing of reduplication, tone spreading, and the formation of domains within the Nguni verb.

References

- Beckman, Jill. 1993. Feature organization and the strong domain hypothesis in Zulu [labial] phonology. *UMass Occasional Papers in Linguistics* 16:1-26.
- Botne, Robert, and Tiffany Kershner. 2000. Time, Tense, and the Perfect in Zulu. *Afrika und Übersee* 83:161-180.
- Buell, Leston. 2007. Evaluating the immediate postverbal position as a focus position in Zulu. Ms., Leiden University.
- Doke, C.M. 1943. *Textbook of Zulu Grammar* (third edition). London: Longman.
- Downing, Laura. 1990. Local and metrical tone shift in Nguni. *Studies in African Linguistics* 21(3):261-317.
- Downing, Laura. 1997. Correspondence effects in Siswati reduplication. *Studies in the Linguistic Sciences* 25:81-95.
- Downing, Laura. 1998. On the prosodic misalignment of onsetless syllables. *Natural Language and Linguistic Theory* 16:1-52.

The Status of the Macrostem in Reduplication in Ndebele and Zulu

- Downing, Laura. 2001. Ungeneralizable minimality in Ndebele. *Studies in African Linguistics* 30(1):33-58.
- Downing, Laura. 2003. Compounding and tonal non-transfer in Bantu languages. *Phonology* 20:1-42.
- Downing, Laura. 2006. *Canonical Forms in Prosodic Morphology*. London: Oxford
- Downing, Laura. 2009. Linear disorder in Bantu reduplication. Ms., ZAS, Humboldt Universität.
- Embick, David. 2010. *Localism versus Globalism in Morphology and Phonology*. Cambridge: MIT Press.
- Hyman, Larry. 2008. Directional asymmetries in the morphology and phonology of words, with special reference to Bantu. *Linguistics* 46(2):309-350.
- Hyman, Larry. 2009. The natural history of verb-stem reduplication in Bantu. *Morphology* 19:177-206.
- Hyman, Larry, Sharon Inkelas, and Galen Sibanda. Morphosyntactic correspondence in Bantu reduplication. In K. Hanson and S. Inkelas, eds., *The Nature of the Word: Essays in Honor of Paul Kiparsky*, 273-310, Amsterdam: John Benjamins.
- Hyman, Larry and Al Mtenje. 1999. Prosodic morphology and tone: The case of Chichewa. In R. Kager, H. van der Hulst, and W. Zonneveld, eds., *The Prosody-Morphology Interface*, 90-133, Cambridge: Cambridge University Press.
- Inkelas, Sharon, and Cheryl Zoll. 2005. *Reduplication: Doubling in Morphology*. Cambridge: Cambridge University Press.
- Khumalo, J.S.M. 1987. An autosegmental account of Zulu phonology. Ph.D. thesis, University of the Witwatersrand.
- Kisseberth, Charles. 1984. Digo Tonology. In G.N. Clements and J. Goldsmith, eds., *Autosegmental Studies in Bantu Tone*, 105-182, Dordrecht: Foris.
- Meeussen, A.E. 1967. Bantu grammatical reconstructions. *Africana Linguistica* 3 79-121. Tervuren: Musée Royal de l'Afrique Centrale.

Toni Cook

Mutaka, Ngessimo and Larry Hyman. 1993. Syllables and morpheme integrity in Kinande reduplication. *Phonology* 7:73-120.

Myers, Scott. 1987. Tone and the structure of words in Shona. Ph.D. thesis, University of Massachusetts, Amherst.

Odden, David. 1996. Patterns of reduplication in Kikerewe. *OSU Working Papers in Linguistics* 48:111-149.

Sibanda, Galen. 2004. Verbal phonology and morphology of Ndebele. Ph.D. thesis, University of California, Berkeley.

van der Spuy, Andrew. 1993. Dislocated noun phrases in Nguni. *Lingua* 90:335-355.

Toni Cook
University of Pennsylvania
Department of Linguistics
619 Williams Hall
Philadelphia, PA 19104-6305

toncook@ling.upenn.edu