

Generational tone change in Northern Bemba

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While the fundamentals of the tonology of the Bemba variety spoken in and around Zambia's Northern Province in the mid-twentieth century are well documented by multiple renowned Bantu scholars, no comparable study exists describing the tone of today's Modern Northern Bemba speakers, some 70 years later. This study attempts to fill that gap by comparing Classic Northern Bemba and Modern Northern Bemba with respect to the three core and fundamental tonal phenomena witnessed in both varieties: unbounded High tone spreading, bounded High tone spreading, and the effects of the OCP on those spreading processes. We find that while the unbounded spreading process has remained largely unchanged, both bounded spreading and the effects of the OCP have changed in significant ways. We provide a detailed description of Modern Northern Bemba tonology based on extensive elicitations with three Northern Bemba speakers. We provide a hypothesis on how these diachronic tone changes might have developed, and also compare the Modern Northern Bemba tonal patterns to those described for Modern Copperbelt Bemba.

Keywords: Bantu, tone, Bemba, OCP, tonal diachronic change

Introduction

This paper presents a case of language change, particularly focusing on tonal change of which we see very little discussed in the literature (but see Kula (2017)). The focus is on Bemba classified as M42 in Guthrie's classification of Bantu languages (Guthrie 1967-71). Bemba has a number of dialects, with at least 20 dialects noted in the Ethnologue and in the literature (Mwansa 2017, Mambwe, forthcoming). Currently, very little is known about the different dialects although ongoing research is slowly bringing us to a better position. The main dialect considered to be the central dialect, also referred to as Standard Bemba, is spoken in the Northern part of Zambia around Kasama, Chinsali and the area of the paramount chief Chitimukulu in Mungwi. This has been referred to in the literature as Northern Bemba, or Village Bemba or Kasama Bemba, and is the standard taught in schools in early literacy in Bemba speaking areas. Seminal work in this central dialect includes Guthrie (1945), Sharman & Meeussen (1955) and Sharman (1956). In this paper we will refer to this dialect as "Classic Northern Bemba", i.e., the Northern Bemba dialect as described in work from the 1950s. Research following this work from the 1970s to the 1990s all also refers to Standard Bemba as the locus of their work, see *inter alia*, Mann (1977), Kashoki (1968) and Philippson (1998). There are three main areas where Bemba and its dialects are spoken in Zambia, in the north central area covering the Northern and Muchinga Provinces, the north-western area bordering the DRC in the Luapula Province, and the central part of Zambia along the towns of the Copperbelt in the Copperbelt Province and extending to urban parts of the Central Province. Copperbelt Bemba, particularly with respect to tone, has been described and presented in Bickmore & Kula (2013) and Kula & Bickmore (2015). There is some work on the Aushi (M402) dialect from the Luapula Province in Doke (1933) and more recently on subjunctive tones in Bickmore (2018). The dialect of Taabwa (M41) has a dictionary by Acker (1907) and a grammar by De Beerst (1896). We have been unable to locate Taabwa speakers in Zambia in our work with all consultants found having shifted to the standard or the Copperbelt dialect. It has been suggested that there may still be speakers in the DRC, which we continue to pursue. Indeed, Bemba is also spoken in border towns with the DRC in the west and with Tanzania in the east. There is no literature on many of the remaining named dialects – in Zambia: Ambo, Bwile (M401), Bisa, Chishinga, Kabende, Kunda, Lala, Lamba, Lima, Lunda (Luapula), Mukulu, Ng'umbo, Shila, Swaka, Twa of Bangweulu, Unga; and in the DRC: Lembue, Lomotua (Lomotwa), Ngoma and Nwesi.¹

The paper will focus on tonal changes in standard or Classic Northern Bemba based on newly collected data from 2019 onwards. We will term this latter data as representing "Modern Northern Bemba". Data was collected from the heartland of

1. We do not go into the discussion of which of these are dialects versus languages and leave such clarification to future research but note that for most of the "dialects" named here, communities and speakers may well feel that these are independent languages accompanied by distinct customs and cultural practices. We reserve comment until further research in this area. We treat Copperbelt Bemba as distinct from the urban variety referred to in the literature as 'Town Bemba' and its current version now called Kopala or *ici-Kopala*.

Standard Bemba in Kasama and Mungwi. There is little systematic research done on the tonology of modern Northern Bemba and in this sense this paper breaks new ground in beginning to fill that gap by presenting newly collected data illustrating the tone patterns found in Modern Northern Bemba (MNB), based on the speech of 3 native speakers. We compare these patterns to both Classic Northern Bemba as well as Copperbelt Bemba and show that tonal changes in CNB are leading to hitherto unreported patterns in MNB that make the latter dialect pattern more closely to Copperbelt Bemba. This paper thus breaks new ground in offering an analysis of tonal diachronic change.

1. Preliminaries of Bemba tone

We begin by reviewing some preliminaries common to Classic Northern Bemba, Modern Northern Bemba and Copperbelt Bemba. Both tone and vowel length are contrastive. A minimal pair for vowel length in infinitives is shown in (1), and two minimal pairs for tone in imperatives are shown in (2).

- (1) a. **ù-kú-shík-á** /shik/
 AUG-C15-be.deep-FV
 ‘to be deep’
- b. **ù-kú-shíík-á** /shiik/
 AUG-C15-bury-FV
 ‘to bury’
- (2) Tone is contrastive.
- a. **lùk-á** /luk/
 weave-FV
 ‘weave!’
- b. **lúk-á** /lúk/
 vomit-FV
 ‘vomit!’
- c. **ìmb-á** /imb/
 dig-FV
 ‘dig!’
- d. **ímb-á** /ímb/
 sing-FV
 ‘sing!’

Given these surface tone/vowel length combinations, we take the mora to be the Tone Bearing Unit (TBU). It should be noted that contour tones are only found on long vowels, and there are no long Rises.

- (3) a. Short-Low Cà
 b. Short-High Cá
 c. Long-Low Càà
 d. Long-High Cáá
 e. Long-Falling Cää

Analytically, we assume a phonological tonal contrast of H vs. Ø, where L is introduced at the very end of the phonology onto toneless TBUs. With regard to downstep: rather than have this be signaled by a floating L, we follow Odden (1982) in having this be found between two TBUs linked to different H autosegments. Here, a downstep is found between a multiply-linked H followed by another H (i.e. as derived OCP violations). See Bickmore (2000) and (2007) for the same treatment of downstep in other M languages.

2. Tonology of Classic Northern Bemba (CNB)

We begin by reviewing the tonological processes described for what we dub “Classic Northern Bemba,” the variety described by Sharman & Meeussen. We draw principally from their 1955 paper. The first tonal process we note is that of unbounded spreading, which they referred to as “diatony,” illustrated in (4). The rightmost form presented between slashes represents the underlying form in all instances.

- (4) /CáCaCaCa/ → [CáCáCáCá]
 bá-ká-fík-á /bá-ka-fík-a/ S&M (1955: 394)
 c2.SM-FUT-arrive-FV
 ‘they will arrive’

As seen, the final H in the word undergoes unbounded spreading to the end of the word. While in S&M (1955) this was certainly claimed for isolation forms, such as the one above, there was no detailed discussion about when this might also happen sentence-internally. I.e. it was not clear whether this was limited to the last word in the utterance, intonational phrase, or phonological phrase.

The next tonal process was one of bounded spreading. The examples given in S&M (1955) indicate that the High tone spreads to the end of the following syllable. This happened in three different environments. The first, illustrated in (5) affects a H tone in a word which is followed by another word (represented by ‘X’). Unfortunately, no specifics are given in terms of the syntactic or prosodic domain that must include the two words.

- (5) a. /CáCaCaCa X/ → [CáCáCàCà X]
 bá-ká-fík-à... /bá-ka-fík-a/ S&M (1955: 394)
 ‘they will arrive...’
 b. CáCaaCaCa X/ → [CáCááCàCà X]
 tw-ààcí-póós-à... /tu-áci-poos-a/ S&M (1955: 397)
 1pl.SM-PST.TEMP-throw-FV
 ‘when we threw...’

In (5a) the High tone spreads onto the following short vowel, while in (5b) it spreads onto both morae of a following long vowel.² (The first syllable in example (5b) reflects a productive process whereby Rising tones, prohibited in the language (3), become level Low.)

The second environment for bounded spreading is a non-final H in a phrase-final word. This is illustrated in (6).³

- (6) /CáaCaCaCá/ → [CáaCáCàCá]
tu-là-twáál-íl-à = kó /**tu-la-túal-il-a = kó**/ S&M (1955: 400)
 1pl.SM-HAB-take-APPL-FV-C17.LOC
 ‘we take to’

In (6), we see the High tone, which S&M indicate to be underlyingly on the first mora of the bimoraic vowel, spread onto the following short vowel and no further.

The third case involves a High on specific morphemes, which always undergoes bounded spreading, even in the context of (4) (the final H in a phrase-final word) where unbounded spreading would have been predicted. This is illustrated in (7).

- (7) a. H on Object Marker
tw-ààlfi-fi-lóndòlòl-à /**tu-álii-fi-londolol-a**/ S&M (1955: 396)
 1pl.SM-ANT.PST-C8.OM-explain-FV
 ‘we explained them (C8)’
 b. H on negative subjunctive
tw-ii-lóndòlòl-à /**tu-í-londolol-a**/ S&M (1955: 397)
 1pl.SM-NEG.IMP-explain-FV
 ‘let us not explain’

As can be seen, a High tone on an Object Marker (7a), or the Negative Subjunctive (7b), undergoes bounded spreading even though it is the rightmost H in a phrase-final word. In (7b), after the H undergoes Bounded Spreading, the Rising tone on the first syllables resolves to a level Low by the same process mentioned above for (5b).

2. Guthrie (1945: 57) provides another example of a CNB word where a High undergoes bounded spreading onto both morae of a following syllable: **y-ááci-póóm-à** ‘it (C6) roared’ where the H tone on /áci/ spreads onto both morae of the following bimoraic toneless root. As we will discuss below in (32) the H on this particular TAM prefix always undergoes bounded spreading regardless of whether another word follows in the phonological phrase or not.

3. The ending /-ko/ is an enclitic on the verb occurring after the final vowel (see Marten & Kula 2014), noted here with a = boundary. It derives from the class 17 post-verbal locative marker and its meaning can now also extend to a substitutive applicative when used in conjunction with the applicative, or it induces a partitive reading. Phonologically, based on its tonal interaction with the verb stem where it patterns with H-toned suffixes, it is part of the same prosodic word as the verb.

We note here that there is one context where neither unbounded nor bounded spreading affects a tone – a grammatical High tone (sometimes referred to as a “Melodic High” (Odden & Bickmore (2014)) – placed on the second mora of the stem in Imperative forms with toneless roots. This is shown in (8).⁴

- (8) **lòndólòl-à** /londólol-a/ S&M (1955: 398)
 explain-FV
 ‘explain!’

Finally, with regard to these two productive High tone spreading processes of unbounded and bounded spreading, we note that there was no indication in the 1950s literature of what kind of spreading, if any, occurred between words in Classical Northern Bemba. The two High tone spreading processes correlate directly to the conjoint-disjoint distinction with unbounded spreading indicating disjoint forms and bounded spreading indicating conjoint forms. See Kula (2017a) for further discussion.

To summarize the bounded spreading documented for CNB, the instances reported are consistent with spreading to the end of the following syllable. It should be noted that some syllable sequences were simply not presented. For instance, given underlying /CáaCaaCa/, one would assume that the H would spread into the next syllable, though it’s not clear if the phonetic result would be [CáaCáaCà] or [CáaCáaCà].

2.1. OCP Effects in CNB

We now turn to cases where bounded spreading is blocked. In (9a), the H on the SM fails to spread onto the following syllable. This is generally seen as an effect of the Obligatory Contour Principle (OCP) which prevents two successive TBUs from being linked to distinct H autosegments. In (9b), the H on the SM fails to spread to the tautosyllabic mora for the same reason.

- (9) a. /CáCaCa.../ → [CáCàCá...]
 bá-ka-pít-á /bá-ka-pít-a/ S&M (1955: 394)
 c2.SM-FUT-pass-FV
 ‘they will pass’
- b. /CáaCáCa.../ → [CáaCáCa...]
 bá-à-pít-ílé /bá-a-pít-ílé/ S&M (1955: 394)
 c2.SM-PST-pass-PERF
 ‘they passed’

In (10) the High on the TAM prefix /á-/ spreads onto the first mora of the following long vowel. (The first syllable will become level Low as Rising tones are not permitted.) We know from forms like (5b) that the H would normally spread through

4. While Guthrie (1945: 61) indicates a bounded spreading of the grammatical H found in the imperative form **lùbùlùl-à** ‘explain!’, he shows no spreading when the same verb is found in the itive imperative **kà-lùbùlùl-à** ‘go and explain!’.

both morae of the following syllable. Thus, the OCP in this case does not stop the H from spreading at all, as it did in (9a,b), but instead just blocks the latter part of the spreading which would cause an OCP violation.

- (10) /CaáCaaCá/ → [CààCààCá]
tw-ààlfi-fi-láb-ílfi-á /**tu-á-líi-fi-lábilil-a/** S&M (1955: 396)
 1pl.SM-ANT.PST-C8.OM-forget-INTSV-FV
 ‘we forgot about them’

Unfortunately, many different sequences of syllables with long and short vowels were not discussed or presented, such as those below in (11). In addition, no information is given on potential OCP environments across words.

- (11) Potential OCP environments not specifically addressed:

- d. /CáCaaCá/ → [CáCààCá]?, [CáCààCá]?
- e. /CáCaáCa/ → [CáCààCá]?, [CáCààCá]?
- f. /CáaCaCá/ → [CááCàCá]?
- g. /CáaCaaCá/ → [CááCààCá]?, [CááCààCá]?
- h. /CáaCaáCa/ → [CááCààCá]?, [CááCààCá]?

It should be noted that Sharman & Meeussen (1955: 396) did recognize something they refer to as ‘tone slip’ (also introduced and discussed in Guthrie (1945)) which elsewhere in the literature of the time, is sometimes equated to downdrift or downstep. Two such cases are shown in (12), where they say there is a ‘tone slip’ immediately after the long level High in the first syllable.

- (12) Recent Past (/áa-/)

- a. **á-á-fyònt-èlèl-à** /**á-áa-fíont-elel-a/** S&M (1955: 396)
 C1.SM-PST-suck-INTSV-FV
 ‘he/she has just sucked’
- b. **á-á-bà-fyònt-èlèl-à** /**á-áa-bá-fíont-elel-a/** S&M (1955: 396)
 C10SM-PST-C2.OM-suck-INTSV-FV
 ‘he/she has just sucked them’

Here, the assumption may be that the H on the Recent Past disjoint prefix /áa-/ doesn’t spread due to OCP (as in (9b)), but then the word-initial trimoraic syllable gets pared back to bimoraic by the elimination of the 3rd mora, inducing a downstep before the predicted sequence of following Hs (cf. (4)) which S&M phonetically transcribe as Low but describe in the text as ‘slipped’.⁵ This raises the question as to whether an alternative transcription for (12a) could have been **á-á-fyónt-élél-á**.

5. An anonymous reviewer points out that Guthrie sets up this TAM prefix as /áá-/ rather than /áa-/. While an interesting and important analytical observation, we don’t think this will ultimately affect the main point here as either UR will produce a word initial [á-á] where the following verb root begins with a new High, thus triggering the downstep.

A third example of tone slip is given below in (13).

- (13) **twáál-à** /**túal-á**/ S&M (1955: 398)
 take-FV
 ‘take!’

Here again, S&M transcribe the form with a final phonetic Low but note that it is a ‘slip’. One again wonders whether it could have been just as well transcribed as **twáálá**. We are left to wonder what the crucial difference is between (13) and (9b) where spreading onto the second mora of a long vowel is blocked by the OCP.

3. Tonology of modern Northern Bemba (MNB)

Having reviewed the fundamental tonal characteristics of Classic Northern Bemba tonology, let us now turn to a description of Modern Northern Bemba, based on the speech of three speakers.⁶

3.1 Unbounded spreading in MNB

Just as in CNB (4) there is a productive process of unbounded spreading which spreads the rightmost High in a phrase-final word. This is illustrated below in (14).

- (14) a. **bá-ká-mú-shíík-íl-á** /**bá-ka-mu-shiik-il-a**/
 C2.SM-FUT-C1.OM-bury-APPL-FV
 ‘they will bury for him’
 b. **tù-lée-sáámbílish-á** /**tu-lée-sambilish-a**/
 1pl.SM-PROG-teach-FV
 ‘we are teaching’
 c. **tù-kà-mù-páápáátík-íl-á** /**tu-ka-mu-páapaatik-il-a**/
 1pl.SM-FUT-C1.OM-flatten-APPL-FV
 ‘we will flatten for him’

We see that the unbounded spreading is very general in the sense that it targets the High tone in a variety of morphemes, including Subject Markers (14a), TAM prefixes (14b), and roots (14c). While it was not clear in CNB what domain defined the application of unbounded spreading (as only single verbs in isolation were provided), Kula & Bickmore (2015) showed that in Copperbelt Bemba the prosodic domain that defined the application of unbounded spreading was in fact the phonological phrase (as opposed to the intonational phrase or utterance). The relevant generalization is that the rightmost High tone in a word will undergo unbounded spreading to the end of the word as long as the word is the final one in the phonological phrase. This is equally true of MNB, as seen in the example in (15).

- (15) [**bá-ká-mú-shíík-íl-á**]_φ [_φ **Chóólá**] /**bá-ka-mu-shiik-il-a Choola**/
 C2.SM-FUT-C1.OM-bury-APPL-FV Choola
 ‘they will bury for Choola’

6. Our three consultants were males, ranging in age from 35 to 50, all of whom were from the Mungwi area in the Northern Province.

In the example above, the object marker present in the verb is co-referential with the direct object *Choola*. As has been shown in a number of Bantu languages, when a verb (without any OM) is followed by a direct object, the two form part of the same phonological phrase. However, when an OM is present and co-referential with the following object, the two form separate phonological phrases. (See Kula & Bickmore 2015 for a detailed presentation and analysis of this process in CB, Bickmore (2007) for Cilungu, and Clemens & Bickmore (2021) for Rutooro.) As can be seen in the example above, the H on the SM undergoes unbounded spreading to the end of the word, even though another word follows. This unbounded spreading can be contrasted with the bounded spreading seen in (5) when another word followed in the same phonological phrase.⁷

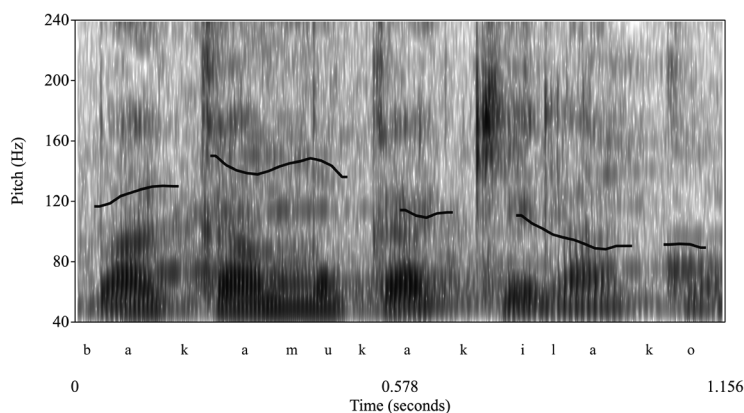
3.2 Bounded spreading in MNB

The environments where bounded spreading occurs in MNB are the same environments described above for CNB ((5)-(7)), i.e. basically all High tones which do not undergo unbounded spreading. However, while the bounded spreading in CNB was to the end of the following syllable, it is generally longer in MNB, and could loosely be characterized as ternary. To define this more precisely, let us examine a range of syllable sequences containing short and long vowels.

First, we consider a High on a short vowel, followed by two short syllables. The spreading in this case is ternary, as seen in the three examples below (the first being accompanied by a pitch track), where the underlying H spreads through the following two short syllables.

(16) /CáCaCaCa.../ → [CáCáCáCà...]

- a. **bá-ká-mú-kàk-ìl-à = kó** /bá-ka-mu-kak-il-a = kó/
 C2.SM-FUT-C1.OM-tie-APPL-FV-C17.LOC
 ‘they will tie for him/her’



7. With regard to the High tones on **Chóólá**, as Kula & Bickmore (2015) detail, a High tone, after having undergone unbounded spreading to the end of the word, undergoes a rule of doubling into the following word, which can then undergo another iteration of unbounded spreading.

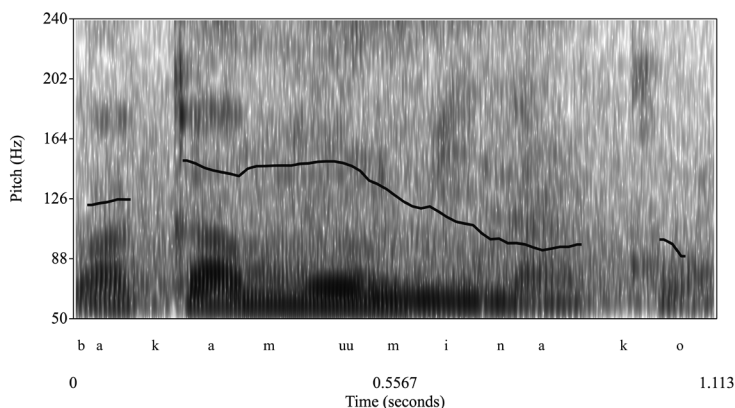
- b. **bá-ká-lúk-il-àn-à = kó** /bá-ka-luk-il-an-a = kó/
 C2.SM-FUT-weave-APPL-RCP-FV-C17.LOC
 ‘they will weave for each other’
- c. **bá-ká-mú-shiik-il-à bwìnò** /bá-ka-mu-shiik-il-a buino/
 C2.SM-FUT-C1.OM-bury-APPL-FV well
 ‘they will bury for him/her well’

In (16a), the High tone is on the subject marker /bá-/. As can be seen by the pitch line tracking F_0 , the High spreads through both of the two following syllables, and then declines, reaching its lowest point on the Final Vowel.

In short-short-long sequences, the ternary spreading results in a Falling tone on the long vowel as seen in the three examples in (17), where the first is accompanied by a pitch track. In (17a,b) the spreading affects a Subject Marker, whereas in (17c) it affects an Object Marker.

(17) /CáCaCaa.../ → [CáCáCáa...]

- a. **bá-ká-mú-ùm-in-à = kó** /bá-ka-mu-um-il-a = kó/
 C2.SM-FUT-C1.OM-beat-APPL-FV=C17.LOC
 ‘they will beat for him/her’



- b. **bá-ká-sààmbilish-à bwìnò** /bá-ka-sambilish-a buino/
 C2.SM-FUT-teach-FV well
 ‘they will teach well’
- c. **tà-bá-mú-shiik-ilé** /ta-bá-mu-shiik-ilé/
 NEG-C2.SM-C1.OM-bury-FV
 ‘they haven’t buried him’

Let us now turn to forms where the second syllable has a long vowel. In such cases the H on the initial short vowel spreads through the second syllable and onto the initial mora of the third syllable. This shows that the spreading cannot be stated purely in terms of morae, as the H spreads onto the following three morae in (18), and not just two as was seen in (16)-(17).

(18) /CáCaaCa(a).../ → [CáCááCá(à)...]

- a. **bá-k-óóm-ín-à = kó** /bá-ka-um-il-a = kó/
C2.SM-FUT-beat-APPL-FV=C17.LOC
'they will beat for'
- b. **bá-shíík-íl-àn-à bwìnò** /bá-shiik-il-an-a buino/
C2.SM-bury-APPL-RCP-FV well
'they bury for each other well'
- c. **bá-póós-él-àn-à bwìnò** /bá-poos-il-an-a buino/
C2.SM-throw-APPL-RCP-FV well
'they throw to each other well'
- d. **bá-tw-ééléèngàny-à = kó** /bá-tu-elengany-a = kó/
C2.SM-1pl.OM-imagine-FV=C17.LOC
'they imagine us'
- e. **tù-kà-mù-bélééng-él-à bwìnò** /tu-ka-mu-béleeng-il-a buino/
1pl.SM-FUT-C1.OM-read-APPL-FV well
'we will read to/for him/her well'

Here again we see that different types of morphemes are affected – the Subject Marker High in (18a-d) and a root High in (18e). The form in (18d) shows that when the third syllable has a long vowel, a Falling tone is obtained.⁸

Up to this point, one might conclude that the pattern is that the High spreads to the first mora of the third syllable. To illustrate that the spreading is more complicated than that, we now turn to forms where the first syllable has a long vowel. Below we show forms where the vowel in the first syllable is long, and is followed by two syllables with short vowels.

(19) /CáaCaCa/ → [CááCáCà]

- a. **tù-lée-mú-kàk-il-à = kó** /tu-lée-mu-kak-il-a = kó/
1pl.SM-PROG-C1.OM-tie-APPL-FV=C17.LOC
'we are trying for him/her'

8. Phonetically measured, Hamann & Kula (2021) show that lexical long vowels in CB have full length, while pre-NC long vowels which are the result of pre-nasal lengthening have an intermediate length between lexically long and short vowels. The phonological behaviour of pre-NC vowels with respect to tone assignment varies with some cases supporting a view that they contain two moras, while at the same time some evidence supports an analysis more consistent with one mora. For example, a reviewer notes that in some non-phrase final forms in CNB lexical vowel length and pre-NC length contrast tonally: cf. **tùkàláálà** 'we'll lie down', and **tùkàlú:ngá** 'we'll go hunting', where H tone doubles on to the final in the later form. Based on wider evidence considered in Hamann & Kula (2021) they conclude that the case is at present inconclusive. Considering all other tonal patterns related to length we treat pre-NC vowels here consistently as having two moras, noting that further work is needed on this. Indeed, it may be that over time pre-NC vowels will more consistently pattern one way. Pre-NC length was not indicated for CNB in S&M and so this does not allow us to test what interaction these vowels may have had with tone.

- b. **tù-kà-kóóntól-àn-à sáaná** /tu-ka-kóntol-an-a sáaná/
 1pl.SM-FUT-break-RCP-FV a.lot
 ‘we will break each other a lot’
- c. **tù-kà-bá-álúk-il-à = kó** /tu-ka-bá-aluk-il-a = kó/
 1pl.SM-FUT-C2.OM-betray-APPL-FV=C17.LOC
 ‘we will betray them’

As seen in the forms in (19), the H on the first mora of a long vowel spreads onto the tautosyllabic mora and onto the short vowel in the second syllable, but no further (i.e., not into the third syllable).

In (20) we find forms where the H is underlyingly on the first mora of a bimoraic syllable, and the second syllable is also bimoraic.

- (20) /CáaCaaCa/ → [CáaCáaCà] ~ [CáaCáaCà]
- a. **tù-lée-mú-ùm-in-à = kó** /tu-lée-mu-um-il-a = kó/
 1pl.SM-PROG-C1.OM-beat-APPL-FV=C17.LOC
 ‘we are beating for him/her’
- b. **tù-kà-b-ééléèngàny-à = kó** /tu-ka-bá-elengany-a = kó/
 1pl.SM-FUT-C2.OM-imagine-FV=C17.LOC
 ‘we will imagine them’
- c. **tù-lée-mú-úm-à = kó** /tu-lée-mu-um-a = kó/
 1pl.SM-PROG-C1.OM-beat-FV=C17.LOC
 ‘we are beating him/her’
- d. **páápáátik-il-á** /páapaatik-il-á/
 flatten-APPL-FV
 ‘flatten for!’
- e. **tù-kà-tóóntóónkàny-à = kó** /tu-ku-tóntonkany-a = kó/
 1pl.SM-FUT-think-FV=C17.LOC
 ‘we will think’

In the cases above the High tone spread onto the tautosyllabic mora as well as onto the first mora of the following syllable, just as it did in (19). In some cases (e.g. (20a,b)) that is the end of the spreading resulting in a Falling tone on the second syllable, but in other cases (e.g. (20c-e)), the High continues to spread through both morae of the second syllable.

We note here that the MNB patterns are identical in all important respects to those found in Copperbelt Bemba as described in Bickmore & Kula (2013) – both in terms of the context which determines when bounded spreading occurs (vs. unbounded spreading), and how far the H will spread. The one small possible difference lies in the /CáaCaa.../ cases where B&K (2013: 18-19) noted the output in the two examples presented (of the same verb) as Falling on the second syllable, whereas variability is noted for MNB between Falling and level High.

A summary of the spreading patterns based on the input sequence of monomoraic and bimoraic syllables is given below.

(21) Summary of spreading patterns

Input	CNB	MNB
a. /CáCaCaCa/	CáCáCàCà (5a)	CáCáCáCà (16)
b. /CáCaCaa/		CáCáCàà (17)
c. /CáCaaCaCa/	CáCááCàCà (5b)	CáCááCáCà (18)
d. /CáaCaCa/	CááCáCà (6)	CááCáCà (19)
e. /CáaCaaCa/		CááCáàCà ~ (20) CááCááCà

Let us now turn to formulating an overall characterization of the bounded spreading patterns in Classic Northern Bemba and Modern Northern Bemba.

4. Accounting for tonal change from CNB to MNB

The available literature on Classic Northern Bemba indicates that a High tone spreads to the end of the following syllable. In some instances, that's a single mora (5a), and in others that's two morae (5b).

In Modern Northern Bemba, bounded spreading can't easily be described purely in terms of syllables, as sometimes the end of the spreading is in the second syllable ((19), (20)), and sometimes it's in the third syllable ((16)-(18)). It also can't be described purely in terms of morae, as sometimes the spread is to two morae ((16), (17), (19), (20)), and sometimes to three morae ((18), (20)). One way to understand the MNB pattern in a derivational model is to consider it happening in two steps (as suggested for CB in Bickmore & Kula (2013)). First there is a process of Primary Doubling, where a H spreads onto a following mora (regardless of syllable structure), and then there is a process of Secondary Doubling, where a H continues to spread onto the first mora of the following syllable. (The only remaining thing to account for is the variation seen in (20) where spreading can optionally continue onto the second mora of the second syllable.) The reader is referred to B&K (2013) for arguments supporting analyzing these as separate processes. For instance, Secondary Doubling never spreads a H onto a phrase-final TBU whereas Primary Doubling does, and as will be discussed below Secondary Doubling is constrained by the OCP whereas Primary Doubling is not.

One possible diachronic account of the change in bounded spreading from CNB to MNB revolves around the TBU targeted in spreading. The TBU targeted in bounded spreading in CNB seems to be the syllable – i.e. spread is through the end of the immediately following syllable, regardless of whether the first or second vowel is short or long (stage 1 in (22) below). Speakers at an intermediate stage may have reinterpreted the TBU from the syllable to the mora. If so, then while cases such as (5a) would be viewed as binary spreading (in terms of morae), cases such as (5b) and (6) would be interpreted as ternary spreading. This ternarity could have then generalized to all cases, including (5a), resulting in a subsequent stage (#2 below), where the H always spreads to the following two morae. The three proposed historical stages are given in (22).

(22) Proposed diachronic changes in bounded spreading in Bemba

Input	1-CNB	2	3-MNB
a. /CáCaCaCa/	CáCáCàCà	CáCáCáCà	CáCáCáCà
b. /CáCaaCaCa/	CáCááCàCà	CáCááCàCà	CáCááCáCà
c. /CáaCaCa/	CááCáCà	CááCáCà	CááCáCà
d. /CáaCaaCa/	CááCááCà?	CááCáàCà	CááCáàCà ~ CááCááCà

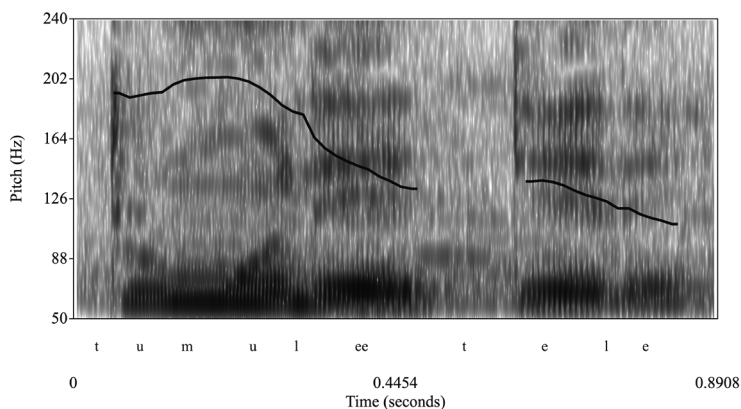
Stage 1 is Classic Northern Bemba, where bounded spreading is binary if the TBU is assumed to be the syllable. (While this predicts the spreading indicated in (22d), we regrettably could not find any actual examples of this prosodic shape in the existing literature.) In moraic terms, at this stage some of the spreading is binary (22a) and some is ternary (22b,c). At Stage 2, speakers reinterpret the TBU to be the mora, where the spreading is uniformly ternary. This pattern, already present in (22b,c), induces the change in (22a), where a High spreads onto two following monomoraic syllables. At stage 3, speakers reinterpret the generalization again, this time to be that if the underlying H is on the first mora of a long vowel, then it will just spread onto the first mora of the following syllable (true of both (22c,d), whereas if it is on a short vowel it will spread into the third syllable. This has the effect of extending the spreading in (22b) to match that of (22a) in terms of syllables. Thus, the pattern in Modern Northern Bemba is dependent on both syllables and morae.

5. The OCP in MNB

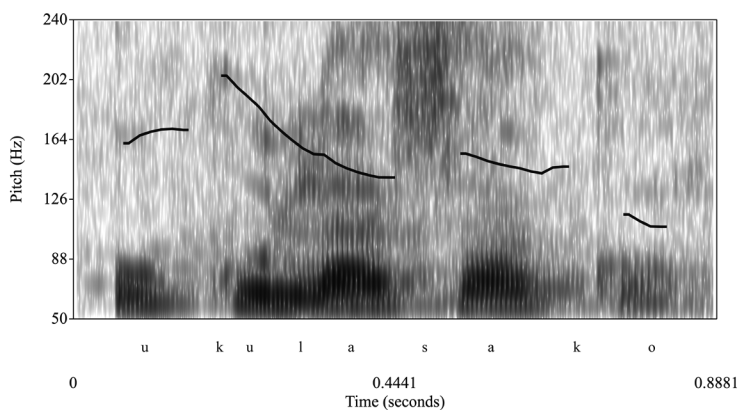
Let us now turn to the OCP as a constraint on H tone spreading. Unlike CNB where the OCP blocks bounded spreading, in MNB we find that Doubling onto the following mora happens even if it violates the OCP, creating a phonetic downstep, exactly as in Copperbelt Bemba. This is shown below in (23a,b).

(23) /CáCaCá/ → [CáCá'Cá]⁹

- a. **tú-mú-'léét-él-é** /tú-mu-léet-il-e/
 1pl.SM-C2.OM-bring-APPL-SUBJ
 'let's bring for him/her'



- b. **ú-kú-'lás-á = 'kó** /ú-ku-lás-a = kó/
 AUG-C15-shoot-FV=C17.LOC
 'to shoot'



9. In (12) and (13) we discussed S&M's use of "tone slip" to possibly refer to what we would now consider to be "downstep". In the CNB case the word-final string of downstepped Hs were represented in S&M as phonetically low-toned. In terms of the phonetics of CB and MNB, it is quite possible that there is some surface variation between this word-final, post High stretch of TBUs surfacing as more Mid-toned (represented as downstepped Hs) and Low.

In (23a) the H tone on the Subject Marker /**tú**-/ spreads onto the following Object Marker /**mu**-/ even though it creates an OCP violation with the H on the root /**léet**/. In (23b) two downsteps are created. The first is due to the High on the Preprefix /**ú**-/ spreading onto the following Class 15 prefix /**ku**-/, and the second is due to the High on the root /**lás**/ spreading onto the Final Vowel /-a/, which itself is followed by the Class 17 enclitic /**kó**/.

That bounded spreading also happens intrasyllabically, even though an OCP violation occurs (again causing a downstep), as can be seen below in (24).

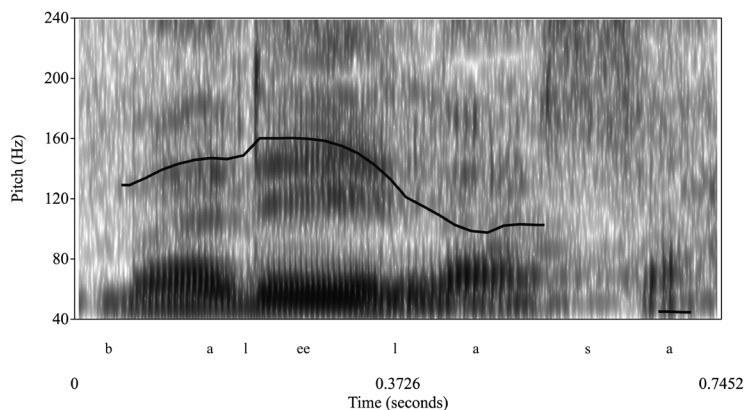
(24) /CáaCá/ → [Cáá'Cá]

bá-lée-lás-á

/bá-lée-lás-a/

C2.SM-PROG-shoot-FV

'they are shooting'



In (24), the H on the first mora of the TAM prefix /**lée**-/ spreads to the following autossyllabic mora, creating a downstep with the High on the root /**lás**/.

As in CB, the MNB pattern is that Primary Doubling (spread of H to immediately following TBU) is *not* blocked by the OCP, but Secondary Doubling (spread to the initial TBU of the following syllable) *is* blocked by the OCP. This is illustrated below.

(25) a. /CáCaaCá/ → [CáCáàCá] (*[CáCáCá!Cá])

bá-mú-shiik-é

/bá-mú-shiik-é/

C2.SM-2pl.OM-bury-SUBJ

'they should bury you (pl)'

b. /CáaCaCá/ → [CááCàCá] (*[CááCá!Cá])

tù-lée-mù-lás-á

/tu-lée-mu-lás-a/

1pl-PROG-C1.OM-shoot-FV

'we are shooting him'

In (25a) the H on the Object Prefix /**mú**-/ spreads onto the first mora of the following syllable [**shiik**]. As seen above in (18), a High tone would normally spread through

both morae of a following syllable, but in this case spreading to the second mora of the long vowel is blocked, due to the OCP. In (25b) the H on the TAM prefix /léé-/ spreads onto the tautosyllabic mora, but does not spread into the next syllable as it normally would (cf. (19)) as that would cause an OCP violation. This process of a High spreading to the following mora, but not onto any additional morae if that would cause an OCP violation, seems to have its roots in CNB, as this was shown to occur in forms such as (10).

In summary, what we find in MNB (as is true in CB) is that a High always spreads onto the immediately following TBU, even if that causes an OCP violation (and when it does this results in a phonetic downstep). Any further spreading in the Bounded Spreading process (summarized in the third column of (21)) is blocked by the OCP. Thus, we find that Bounded Spreading in both CNB and MNB are subject to the OCP, but in different ways. Finally, we note that while bounded spreading of a H onto the immediately following TBU in MNB, in forms such as (23), seems like a major departure from this not being permitted in CNB (cf. (9)), it should be recalled that the existence of tone slip in CNB (cf. (12), (13)) strongly suggests that there were already specific environments at this earlier stage of the language where the OCP was in fact violated by bounded spreading. One can imagine that over time this weakening of the OCP simply became more generalized in the language.

6. Phrasal level H Spreading

Let us now consider spreading between words. As noted above, unfortunately, we could not find any description in the existing CNB literature of tone spreading from one word into another. What we found was that spreading between words in MNB seems to have the same patterns found in CB. In MNB, a word-final H will spread onto the first toneless mora of a following word, as illustrated below, where the H on the FV of the imperative verb spreads onto the first mora of the following proper noun direct object.

- (26) **kàk-á Kápèèmbwá** /kàk-á Kapembuá/
 tie-FV Kapembwa
 ‘tie Kapembwa!’

This Inter-word Doubling is a separate process from the (intra-word) Bounded Spreading we saw above. Were this the same process, we would, for example, expect the H on the FV /-á/ to spread not only onto the first mora of the following word, but into the second syllable of that word as well (cf. (17)).

Given that Inter-word Doubling is a separate process, one might wonder whether Bounded Spreading within a word might feed Inter-word Doubling. That it does can be seen in (27), where the H on the penultimate syllable in the verb undergoes Bounded Spreading onto the FV, which then feeds Inter-word Doubling.

- (27) **tù-kà-písh-á Kápèèmbwá** /tu-ka-písh-a Kapembuá/
 1pl.SM-FUT-chase-FV Kapembwa
 ‘we will chase Kapembwa’

In cases where the following word is completely toneless, Inter-word Doubling feeds Unbounded Spreading (when that following word occurs at the end of a phonological phrase). This is shown below.

- (28) a. **kàk-á Chóólá** /**kak-á Choola**/
 tie-FV Chola
 ‘tie Chola!’
- b. **tù-kà-písh-á Chóólá** /**tu-ka-písh-a Choola**/
 1pl.SM-FUT-chase-FV Choola
 ‘we will chase Chola’
- c. **tù-kà-ly-á bwíínó** /**tu-ka-lí-a buino**/
 1pl.SM-FUT-eat-FV well
 ‘we will eat well’

In (28a-c) the H on either the final or penultimate mora in the verb will spread onto the first mora of the following word via Inter-word Doubling. In each case, since that word is toneless and at the end of a phonological phrase, the spreading continues to the very end of that word. (This explains the spreading through the second word in example (15).)

We note again here that the patterns of H spreading within phrases mirror exactly those described for CB in Kula & Bickmore (2015).

7. Exceptional Spreading in MNB

We now consider some exceptional spreading patterns in MNB. We first examine cases of Bounded Spreading, where unbounded spreading would have been expected. As in CNB (7a), a H on an Object Marker undergoes bounded rather than unbounded spreading, even when it’s the rightmost H in a phrase-final word. This can be seen in the examples below where bounded spreading occurs, even though there are additional toneless TBUs which follow within the same word.

- (29) a. **tù-kà-bá-lúk-íl-à** /**tu-ka-bá-luk-il-a**/ (cf. (7a))
 1pl.SM-FUT-C2.OM-weave-APPL-FV
 ‘we will weave for them’
- b. **tù-kà-bá-lóóndólòl-à** /**tu-ka-bá-londolol-a**/
 1pl.SM-FUT-C2.OM-introduce-FV
 ‘we will introduce them’

Also, as in CB (7b), the H on the Negative Subjunctive prefix /í-/ undergoes Bounded Spreading, even when it is the rightmost H in a phrase-final word.

- (30) **tw-ìì-mú-sààm̀bìlìsh-à** /**tu-í-mu-sambilish-a**/
 1pl.SM-NEG-IMP-C1.OM-teach-FV
 ‘let us not teach him/her’

Next, the Melodic High tone which docks onto the second TBU of the stem undergoes Bounded rather than Unbounded Spreading in the affirmative Imperative with toneless roots in MNB. As we saw above in (8), in this same context the High in CNB did not spread at all. Thus, what seems to be consistent in the two varieties is that the spreading in MNB is generally one TBU more than in CNB. When binary spreading occurs in CNB, then it is ternary in MNB, and when there is no spreading in CNB (as in (31)), then there is binary spreading in MNB.

(31) Bounded Spreading in Imperative with toneless root.

- a. **sààmbílish-à** /**sambilish-a** +MH/
teach-FV
'teach!'
- b. **sààmbílish-ish-à** /**sambilish-il-a** +MH/
teach-APPL-FV
'teach for'
- c. **sààmbílish-ish-ààny-à** /**sambilish-il-an-i-a** + MH/
teach-APPL-RCP-FV
'teach for each other'

Next, we turn to the Near Past, which is signaled morphologically by the prefixes /á-cí-/. In this TAM, the rightmost H in the verb undergoes bounded rather than unbounded spreading, even when the verb is phrase-final.

- (32) a. **tw-àà-cí-mú-lúk-íl-à** /**tu-á-cí-mú-luk-il-a**/
1pl.SM-PST-REC-C1.OM-weave-APPL-FV
'we weaved for you (pl)'
- b. **bá-á-cí-fúúk-à** /**bá-á-cí-fuuk-a**/
C2.SM-PST-REC-smoke-FV
'they smoked'
- c. **bá-á-cí-mú-sààmbilish-à** /**bá-á-cí-mu-sambilish-a**/
C2.SM-PST-REC-C1.OM-teach-FV
'we taught him/her'
- d. **bá-á-cí-bélééng-à** /**bá-á-cí-béleng-a**/
C2.SM-PST-REC-read-FV
'they read'
- e. **bá-á-cí-páápáatik-il-àn-à** /**bá-á-cí-páapaatik-il-an-a**/
C2.SM-PST-REC-flatten-APPL-REC-FV
'they flattened for each other'
- f. **bá-á-cí-tú-bélééng-él-à** /**bá-á-cí-tú-béleng-il-a**/
C2.SM-PST-REC-1pl.OM-read-APPL-FV
'they read for us'

While this bounded spreading is not exceptional for a High-toned OM (32a) (cf. (29)), it is unexpected for the High on the TAM prefix /cí-/ (32b,c) or the root (32d-g).

In the main clause negative of the Present Progressive, the root High exceptionally undergoes bounded rather than unbounded spreading.

- (33) a. **tà-tù-lèè bélééng-à** /**ta-tu-lee-béleng-a/**
 NEG-1pl.SM-PROG-read-FV
 ‘we are not reading’
- b. **tà-tù-lèè-mù-bélééng-él-à** /**ta-tu-lee-mu-béleng-il-a/**
 NEG-1pl.SM-PROG-C1.OM-read-APPL-FV
 ‘we are not reading for him/her’
- c. **tà-tù-lèè-bá-bélééng-él-à** /**ta-tu-lee-bá-béleng-il-a/**
 NEG-1pl.SM-C2.OM-read-APPL-FV
 ‘we are not reading for them’

In the Negative Perfect, the root High exceptionally undergoes bounded rather than unbounded spreading.

- (34) a. **tà-tù-làà-bélééng-à** /**ta-tu-laa-béleng-a/**
 NEG-1pl.SM-PERF-read-FV
 ‘we haven’t read yet’
- b. **tà-tù-làà-mù-bélééng-él-à** /**ta-tu-laa-mu-béleng-il-a/**
 NEG-1pl.SM-PERF-C1.OM-read-FV
 ‘we haven’t read yet for him/her’
- c. **tà-tù-làà-bá-bélééng-él-à** /**ta-tu-laa-bá-béleng-il-a/**
 NEG-1pl.SM-PERF-C2.OM-read-APPL-FV
 ‘we haven’t read yet for them’
- d. **tà-tù-làà-mù-páápáátàlik-il-à** /**ta-tu-laa-mu-páapaatalik-il-a/**
 NEG-1p.SM-PERF-C1.OM-flattern-APPL-FV
 ‘we haven’t flattened yet for him/her’
- e. **tà-tù-làà-bá-sáánsámúsh-ish-à** /**ta-tu-laa-bá-saansamush-ish-a/**
 NEG-1pl.SM-PERF-C2.OM-be.happy-CAUS-FV
 ‘we haven’t yet made happy for them’

The rightmost High in relative clauses undergoes bounded, rather than unbounded spreading, as illustrated below in (35)-(37).

- (35) Future
- a. **á-bá-kà-sààm bilish-à** /**á-ba-ka-sambilish-a/**
 AUG-C2.SM-FUT-teach-FV
 ‘those who will teach’
- b. **á-bá-kà-mù-bélééng-él-à** /**á-ba-ka-mu-béleng-il-a/**
 AUG-C2.SM-FUT-C1.OM-read-APPL-FV
 ‘those who will read for him/her’

(36) Habitual

- a. **á-bá-sààmbilish-à** /á-ba-sambilish-a/
 AUG-C2.SM-teach-FV
 ‘those who teach’
- b. **á-bá-mù-bélééng-él-à** /á-ba-mu-béleng-il-a/
 AUG-C2.SM-C1.OM-read-APPL-FV
 ‘those who read for him/her’
- c. **á-bá-'shí-sààmbilish-à** /á-ba-shí-sambilish-a/
 AUG-C2.SM-NEG-teach-FV
 ‘those who do not teach’

(37) Present Progressive

- a. **á-bá-'léé-sààmbilish-à** /á-ba-lée-sambilish-a/ (cf. (14b))
 AUG-C2.SM-PROG-teach-FV
 ‘those who are teaching’
- b. **á-bá-'léé-mù-'bélééng-él-à** /á-ba-lée-mu-béleng-il-a/
 AUG-C2.SM-C1.OM-read-APPL-FV
 ‘those who are reading for him/her’
- c. **á-bá-'shí-lée-bélééng-à** /á-ba-shí-lee-béleng-a/
 AUG-C2.SM-NEG-PROG-read-FV
 ‘those who are not reading’
- d. **á-bá-'shí-lée-táláántáant-à** /á-ba-shí-lee-tálantant-a/
 AUG-C2.SM-NEG-PROG-stumble-FV
 ‘those who are not stumbling’

Unfortunately, we do not see any common property or obvious generalization among the above forms exhibiting exceptional spreading. Perhaps future research on the historical/comparative nature of such forms might further illuminate this.

Summary & Conclusion

While the fundamentals of the tonology of the Bemba variety spoken in and around Zambia’s Northern Province in the mid-twentieth century is well documented by multiple renowned Bantu scholars, no comparable study exists describing the tone of today’s Modern Northern Bemba speakers, some 70 years later. This study attempts to fill that gap. It not only provides a point-by-point comparison with the documented patterns in Classic Northern Bemba but goes above and beyond that in describing tonal processes not documented at all for the older variety. Specifically, we have shown that the three core tonal phenomena attributed to CNB – unbounded spreading, bounded spreading and the precise effects of the OCP – are all also present in MNB. While there seems to be little change in the application of unbounded spreading, both bounded spreading and the tonal OCP effects are significantly different. The bounded spreading in MNB is generally longer, being

better characterized as ternary. And the OCP effects are different in MNB, permitting bounded spreading in cases where CNB did not. In addition to examining these three core processes, our description of MNB also looked at inter-word spreading in phrases as well as additional cases of exceptional spreading.

We noted that the tonal patterns of MNB very much parallel what has been documented for Copperbelt Bemba. Thus, the interesting and significant “difference” between varieties is not synchronic (i.e., between MNB and CB) but instead diachronic. In that vein, we proposed a possible historical scenario that could account for the diachronic change from the CNB patterns to the MNB (and CB) ones. This crucially involves what speakers analyze as the tone bearing unit. All evidence from CNB suggests that at that stage it was the syllable. There was a simple rule which spread a High from one syllable into and through the following one. We suggest that at some point in time speakers reanalyzed the spreading patterns with the mora as the tone-bearing unit. In some contexts, what had been interpreted as binary spreading through syllables became ternary spreading through morae. At an intermediate stage, then, all spreading became ternary in this respect. The second and final change (fully accounting for the present patterns) consisted of speakers reanalyzing the spreading one last time as being sensitive to both syllable and moraic structure. As has been claimed for Copperbelt Bemba, viewed in derivational terms, these modern patterns result from two different bounded processes. Supporting evidence for this is that the first of these two is not blocked by the OCP, but the second is. Further research on other modern Bemba varieties may shed additional light on how CNB ultimately gave rise to the various synchronic tonal patterns we see today.

Abbreviations

1pl	1 st person plural
2pl	2 nd person plural
ANT	Anterior
APPL	Applicative
AUG	Augment
C#	Noun Class number
FUT	Future
FV	Final Vowel
HAB	Habitual
IMP	Imperative
INTSV	Intensive
LOC	Locative
OM	Object Marker
PERF	Perfective
PROG	Progressive
PST	Past
RCP	Reciprocal
REC	Recent
SM	Subject Marker

SUBJ	Subjunctive
TEMP	Temporal

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Résumé

Alors que les fondamentaux de la tonologie de la variété bemba parlée dans et autour de la Province septentrionale de la Zambie au milieu du XX^e siècle ont été bien documentés par nombre de spécialistes réputés du bantou, il n'existe pas d'étude comparable décrivant le ton des locuteurs du bemba septentrional moderne, quelque 70 ans plus tard. La présente recherche tente de combler cette lacune en comparant le bemba septentrional classique et le bemba septentrional moderne pour ce qui concerne les trois phénomènes tonals fondamentaux observés dans ces deux variétés : la propagation illimitée du ton Haut, la propagation délimitée du ton Haut et les effets de l'OCP sur les processus de propagation. Nous avons trouvé qu'alors que le processus de propagation illimitée est resté largement inchangé, la propagation délimitée et les effets de l'OCP ont changé de façon significative. Nous apportons une description détaillée de la tonologie du bemba septentrional moderne, élaborée sur base d'une élicitation approfondie de trois locuteurs du bemba septentrional. Nous présentons une hypothèse sur la façon dont ces changements diachroniques tonals peuvent s'être développés, et comparons les modèles tonals du bemba septentrional moderne et ceux décrits pour le bemba moderne du Copperbelt.