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## Single URs vs. allomorphy: The case of Babanki coda consonant deletion

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### 1. Introduction

The purpose of this paper is to account for a number of phonological alternations that occur on nouns, verbs, deverbal adjectives, and pronouns at the postlexical level in Babanki, a Grassfields Bantu language spoken in Cameroon.<sup>2</sup> The alternation involves the deletion of certain coda consonants between two underlying vowels. This can be illustrated by the deletion of /ŋ/ which is accompanied by the raising of /a/ and /o/ to [o] and [u] respectively (Mutaka & Phubon 2006):<sup>3</sup>

(1)	ə́sáŋ	‘corn’	ə́sō: ghómá	‘my corn’	/ə́sáŋ ə́ ghómá/
	ə́són	‘tooth’	ə́sū: ghómá	‘my tooth’	/ə́són ə́ ghómá/
	àkwéŋ	‘arms’	àkwē: ghómá	‘my arms’	/àkwéŋ à ghómá/

These changes fail to occur if /ŋ/ is not followed by a vowel in the underlying representation (UR), as illustrated in the second example in (2).

(2)	əkáŋ	‘dishes’	əkó: wì?	‘a person’s dishes’	/əkáŋ é wì?/
	kəkáŋ	‘dish’	kəkáŋ ʰkə́ wì?	‘a person’s dish’	/kəkáŋ ké wì?/

There are two possible ways to account for these changes, namely, a rule- or constraint-based phonological analysis which starts with an input from which an output is derived, and a precompiled phonology approach in which allomorphs are listed with appropriate frames where they are inserted (Hayes 1990). In the first approach, proposed underlying segmental forms are exactly as they would occur in isolation, for

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<sup>1</sup> This paper was written during my stay at the University of California, Berkeley as a Fulbright research scholar (Sept. 1, 2015 - May 31, 2016) and I would like to sincerely thank Larry Hyman for his invaluable input at all stages of the life of this paper.

<sup>2</sup> Although native speakers of the language prefer to use Kejom when referring both to the language and the two villages where it is spoken, I have chosen Babanki, the administrative name by which the language and the people are widely known.

<sup>3</sup> The rest of the data in this paper are drawn from a lexical database of 2000 entries in Filemaker Pro™.

example, [ə̀sáj] ‘corn’, [ə̀]<sup>4</sup> ‘of’, [ghómá] ‘mine’.<sup>5</sup> However, a major challenge that emerges is how to capture the conditions that specifically determine the vowel changes. I therefore propose an account positing allomorphs and argue that for every word involved in the alternation, the grammar automatically generates allomorphs marked for specific phonological instantiation frames.

After an introduction to the phonology of Babanki in section 2, I provide an overview of phrasal allomorphy in section 3. In section 4, I illustrate the consonant deletion process using the velar nasal and then move further in section 5 to discuss the different contexts where these coda consonants are deleted. I equally show how vowel raising takes place after velar nasal deletion.

## 2. Babanki Phonology

According to Akumbu and Fogwe (2012), there are 26 phonemic consonants (Table 1), 8 vowel phonemes (Table 2) and two underlying tones: /H/ and /L/.<sup>6</sup>

Table 1: Consonant Phonemes

	Bilabial	Labiodental	Alveolar	Postalveolar	Palatal	Velar	Glottal
Stops	b		t, d			k, g	ʔ
Nasals	m		n		ny [ɲ]	ŋ	
Fricatives		f, v	s, z	sh [ʃ], zh [ʒ]		gh [ɣ]	
Affricates		pf, bv	ts, dz	ch [tʃ], j [dʒ]			
Liquids			l				
Glides	w			y [j]			

Table 2: Vowel Phonemes

	Front	Central	Back
High	i	ɨ	u
Mid	e	ə	o
Low		a	

<sup>4</sup> ə̀ occurs with most noun classes and the class marker itself is suffixed to some roots as ə̀-ghóm-ə̀ ‘class 5 and 8’, ə̀-kóm-ká ‘class 7’, ə̀-shóm-sá ‘class 10’, ə̀tyóm-tá ‘class 13’, ə̀-fwóm-fé ‘class 19’ while class 1 and 9 are not marked: ə̀-ghóm. Class 6 alone has ə̀-: ə̀-ghóm-ə̀.

<sup>5</sup> The exact tonal representations are more complex than what is generally shown in this paper as phonetic L-H nouns in (1) for example, represent a neutralization of three distinct morphotonemic inputs discussed by Hyman (1979) and Akumbu (in preparation).

<sup>6</sup> On the surface, Babanki contrasts three level tones, H, M, L, plus a downstepped High (<sup>4</sup>H). It also has contrast between a falling (L) and a level low (L°) tone before pause (Akumbu in preparation).

Syllable structures in Babanki include V, CV, CGV, CVC and CGVC, where G stands for glide. Words in the language mostly consist of a monosyllabic root with a possible V or CV prefix and/or suffix. Stems always begin with a consonant, while the only vowels that can occur at the beginning of a word are the prefixes a- and ə-. Nouns can take a prefix or (in class 10) a suffix while verbs can have a prefix (infinitive) or other suffixes and extensions. All of the consonants in Table 1 can occur stem-initially except /ʔ/, while only the six consonants /m, n, ŋ, f, s, ʔ/ can occur as codas, as exemplified in (3).

- (3) ə-wúm 'egg'  
 fə-nyín<sup>7</sup> 'bird'  
 jìŋ 'hunger'  
 ə-<sup>l</sup>chíf 'to advise'  
 ə-bìs 'to scatter'  
 ə-<sup>l</sup>kúʔ 'to climb'

The following table shows vowels that contrast before each of the above six coda consonants:

Table 3: VC Rimes

	m	n	ŋ	f	s	ʔ
i		əfwín 'leg'			ə-bìs 'to scatter'	əbwiʔ 'hit'
e <sup>8</sup>	əbèm 'belly'	ə <sup>l</sup> bén 'dance'		kəfyèf 'thickness'	əchès 'pour'	əbèʔ 'seize'
a	əbàm 'heat'	əbàn 'hate'	əbàŋ 'scrape'	əwàf 'frighten'	əbàs 'cut open'	əbàʔ 'take off'
ə	ədèm 'to grunt'	ə <sup>l</sup> lyán 'slide'	əlyəŋ 'bamboo'	ədyaðf 'be long'		əkəʔ 'face'
í	lí m 'husband'		jìŋ 'hunger'	ə <sup>l</sup> líf 'to hurry'		əlífʔ 'poison'
ʉ	kətàm 'odour'			kəntəf 'stomach'	ə <sup>l</sup> dás 'to emit'	əlè 'raffia palm'
o	ə <sup>l</sup> kóm 'to clean'	ntòn 'pot'	ətón 'navel'	əfwóf 'wind'	əfwès 'to fart'	əbòʔ 'to open'
u	əwúm 'egg'	wún 'tatto'	ə <sup>l</sup> búŋ 'to melt'	əgùf 'to drive'	əlùs 'to be blunt'	əkúʔ 'ladder'

### 3. Phrasal Allomorphy

This work draws on phrasal allomorphy developed and argued for by Zwicky 1985, 1987, Pullum and Zwicky 1988 and extended by Hayes (1990). According to Hayes (1990:92), “Phrasal allomorphs may be derived by phonological rule within the lexical phonology, so that whole classes of words will have multiple precompiled allomorphs.” Allomorphy uses the notion of phonological instantiation which “...suggests that words

<sup>7</sup> In final position /n/ is realized as yn [ɲ] in the Kejom Ketinguh dialect of Babanki.

<sup>8</sup> /e/ and /o/ are realized as [ɛ] and [ɔ] respectively in closed syllables (Mutaka & Chie 2006:75).

appear in syntactic representations in rather abstract form, consisting of a kind of place marker, lacking in phonological content...”(Hayes 1990:91), and filled in post-syntactically with phonemic material. Frames exist in the lexicon of a language and serve as the contexts for the realization of allomorphs. In other words, if the grammar of a language generates more than one allomorph of a word, each of them will have a particular phonological frame where it can be inserted, making it possible to explain those morphological alternations that cannot be insightfully accounted for using phonological rules. A frame for the allomorphs of the indefinite article a/an in English will be as follows:

- (4) English Indefinite article  
 Allomorphs: [ən, ə]  
                   [ən] / [ \_ V]  
                   [ə]

Phonological instantiation is governed by the Elsewhere condition (Kiparsky 1973) “...which insures that the most specific insertion context that is applicable in any particular environment takes precedence over more general insertion contexts” (Hayes 1990:92-93).

As I will now describe in considerable detail, the coda consonants /n/ and /ŋ/ are regularly deleted when they occur in intervocalic position, the second vowel being either a suffix, a clitic, or the prefix of a following word. I begin in §3 with /ŋ/ since specific vowel changes accompany its deletion.

#### 4. Deletion of /ŋ/

As stated by Mutaka and Chie (2006), “...when the possessive adjective is used with the nouns ending in **ŋ**, this **ŋ** deletes and this is accompanied by vowel raising, namely the vowel **a** that raises to [o] and the vowel **o/ɔ** that raises to [u].” They have further stated that the same alternation is observed when these nouns are in an associative (possessive) construction and in certain verbal constructions. I show in (5) that velar nasal deletion with vowel raising is attested in many more contexts than they identified.

- (5) a. Noun + Possessive Pronoun
- |             |            |                  |
|-------------|------------|------------------|
| ə̄sō: ghómá | ‘my corn’  | /ə̄sáj ə̄ ghómá/ |
| ə̄sū: ghómá | ‘my tooth’ | /ə̄sój ə̄ ghómá/ |

b. Noun + Noun

èsó: nyàm	‘animal’s corn’	/èsáj é nyàm/
èsú: nyàm	‘animal’s tooth’	/èsój é nyàm/

c. Noun + Deverbal Adjectives

èsō: kú <sup>l</sup> ghá	‘raw corn’	/èsáj è kúghá/
èsū: fí <sup>l</sup> ghá	‘new tooth’	/èsój è fíghá/

d. Noun + Interrogative

èsò: kò <sup>o</sup>	‘which corn’	/èsáj è kò’/
àsù: kò <sup>o</sup>	‘which teeth’	/èsój à kò’/

e. Noun + ‘a certain’

èsō: tsé:	‘a certain corn’	/èsáj è tséná/
àsū: tsé:	‘some teeth’	/èsój à tséná/

f. Noun + All

àsò: tsəm	‘all the corn’	/àsáj è tsəm/
àsù: tsəm	‘all the teeth’	/èsój à tsəm/

g. Noun + Numeral

àsò: bò <sup>o</sup>	‘two corn’	/àsáj à bò’/
àsū: tá?	‘three teeth’	/èsój à tá’/

h. Noun + How Many

àsò: shè?	‘how many corn?’	/àsáj à shè’/
àsù: shè?	‘How many teeth?’	/èsój à shè’/

i. Noun + Interrogative ‘who’

èsó: ndê	‘whose corn?’	/èsáj é ndè/
èsú: ndê	‘whose tooth?’	/èsój é ndè/

<sup>9</sup> As stated in footnote 8 above, [ɔ] is expected in closed syllables. However, there are a few grammatical words in the language where it occurs in open syllables: kò ‘which’, ghò ‘what’ and mbò ‘attention signal’.

j. Progressive

mà sò: ɲkòʔ ‘I am drying wood’ /mà sàŋ ə ɲkòʔ/<sup>10</sup>  
 mà yĩ nsò: ɲkòʔ ‘I was drying wood’ /mà yì é N-sàŋ ə ɲkòʔ/

Apart from /a/ and /o/, three other vowels, namely /i/, /u/, and /ə/ can occur in the /Vŋ/ sequence in Babanki. As shown below, these vowels do not undergo any change when the velar nasal is deleted:

- (6) a. nyì: ghóm ‘my hair’ /nyìŋ ə ghóm/  
 b. èlyú: nyàm ‘animal’s guitar’ /èlyúŋ é nyàm/  
 c. èkwā:<sup>11</sup> fí'ghá ‘new arm’ /èkwáŋ ə fíghá/

In the section that follows, I show that while the velar nasal deletes in Babanki, four other coda consonants also drop in specific contexts. While /ŋ/ deletion is followed by vowel raising under the conditions described in (5.1) below, it is not possible for vowel raising to occur after the deletion of the rest of the coda consonants. Interestingly the bilabial nasal singles out itself to resist deletion making it the only Babanki coda consonant that is not deleted in any circumstance.

### 5. Coda Consonant Deletion

Of the six coda consonants, five can be deleted intervocally leaving only /m/ unaffected. The different grammatical contexts in which consonant deletion occurs are summarized in Table 4:

Table 4: Contexts of Deletion and Vowel Raising in Babanki

		Coda Consonants					
		ŋ	n	ʔ	f	s	m
1	Noun + Possessive Pronoun	++	+				
	Noun + Noun	++	+				
	Noun + Interrogative	++	+				
	Noun + 'a certain'	++	+				
	Noun + All	++	+				
	Noun + Numeral	++	+				
	Noun + How Many	++	+				
	Noun + Interrogative 'who'	++	+				

<sup>10</sup> The progressive marker is shown without a tone in the underlying form because it seems to be toneless and takes its tone from the verb root, being low with low tone verbs and high with high tone verbs.

<sup>11</sup> Mutaka and Chie (2006:75) have identified “...a limited set of data where the alternation is between ɔ and e.” I have noticed that there is individual variation between ə and ɔ in four words èkwáŋ ~ èkwóŋ ‘arm’, èwáŋ ~ èwóŋ ‘market’, kèkwáŋ ~ kèkwóŋ ‘bone’ kèbáŋ ~ kèbóŋ ‘compound’.

	Noun + Deverbal Adjectives	+	+	+				
	Progressive Aspect	+	+	+				
2	In the words <i>vəwéná</i> ‘them’, <i>féná</i> ‘where’, <i>zéná</i> ‘when’			+				
	Deverbal adjective <i>ghóʔ</i> ‘big’				+			
	Deverbal adjectives <i>dyəf</i> ‘long’ and <i>byíf</i> ‘bad’					+		
	First person plural exclusive pronoun <i>yès</i>						+	
3	CwVN Sequence in both nouns and verbs	+	+					
	Disyllabic Roots	+	+					
	Personal and Animal Names	+	+					
4	Noun + Demonstrative Pronoun <i>áCV</i>	+	+					
	Before Relative Marker <i>á</i>	+	+					
	Before prepositions <i>á</i> (locative, adverbial)	+	+					
	Before preposition <i>à</i> (indirect object)	+	+					
5	Subject (Pro)noun + Agreement (includes immediate future <i>á</i> )	+	+					
	Verb + Object	+	+					
	Serial verbs	+	+					
6	Imperative with low toned verbs	+	+					

As seen, these contexts have been arranged into six groups, which are discussed in turn. The deletion of /ŋ/ with vowel raising and /n/ without vowel raising is presented in (5.1) while in (5.2) instances of exceptional deletion of /n/, /f/, /ʔ/ and /s/ in some words are used to make the case for allomorphy. Cases of /ŋ/ and /n/ deletion without vowel raising are discussed in sections (5.3 - 5.6). Finally, in section (5.7) I present data to show that /m/ is not deleted.

### 5.1. Group 1: Deletion of /ŋ/ with vowel raising and /n/ without

In group 1, a single + indicates that /ŋ/ and /n/ drop out, while ++ indicate that the deletion of /ŋ/ is accompanied by the raising of /a/ and /o/ to [o] and [u], respectively. These processes occur in the noun phrase when modifiers are added to the noun, as well as in progressive verb forms (cf. (5j) above). /ŋ/ deletion with vowel raising is exemplified in (7) while /n/ deletion is shown in (8).

#### (7) a. Noun + Possessive Pronoun

<i>ə̀sō:</i> <i>ghómá</i>	‘my corn’	/ə̀sáŋ ə̀ ghómá/
<i>ə̀sū:</i> <i>ghómá</i>	‘my tooth’	/ə̀sóŋ ə̀ ghómá/

#### b. Noun + Noun Possessor

<i>ə̀só:</i> <i>nyàm</i>	‘animal’s corn’	/ə̀sáŋ ə́ nyàm/
<i>ə̀sú:</i> <i>nyàm</i>	‘animal’s tooth’	/ə̀sóŋ ə́ nyàm/



c. Noun + Interrogative ‘how many?’

àsò: shè?	‘how many corn?’	/àsáŋ à shè?/
àsù: shè?	‘How many teeth?’	/àsóŋ à shè?/

d. Noun + Interrogative ‘whose?’

èsó: ndê	‘whose corn?’	/èsáŋ é ndè/
èsú: ndê	‘whose tooth?’	/èsóŋ é ndè/

e. Verb in the Past Progressive

mà yĩ nsò: ŋkò?	‘I was drying wood’	/mà yì é N-sàŋ ə ŋkò?/
mà tǎ ŋkù: wù	‘I was loving you’	/mà tè é N-kòŋ ə wù/

f. Verb in the Future Progressive

mǎ: né nsò: ŋkò?	‘I will be drying wood’	/mà é né` N-sàŋ ə ŋkò?/
mǎ: lú ŋkù: wù	‘I will be loving you’	/mà é lú` N-kòŋ ə wù/

As seen in the following examples, /n/ deletion also occurs, but without vowel raising:

(8) a. Noun + Possessive Pronoun

kèbā: kóm	‘my fufucorn’	/kèbán è kóm/
kèzò: kóm	‘my spear grass’	/kèzòn è kóm/

b. Noun + Noun Possessor

ŋgà: nyàm	‘animal’s story’	/ŋgàn è nyàm
ntò: nyàm	‘pot of meat’	/ntòn è nyàm/

c. Noun + Deverbal Adjectives

wǎ: byí	‘bad child’	/wàn é byí/
fǎ: fí	‘new fon (king)’	/fòn é fí/

d. Verb in the Future Progressive

mǎ né nchwá: kètyí	‘I will be cutting a stick’	/mà é né` N-chwán ə kètyí/
mǎ lú nló: kètyí	‘I will be begging a stick’	/mà é lú` N-lón ə kètyí/

A general observation to be made about (7) and (8) is that the roots lose their nasals when there is a following schwa which can be (i) an associative (possessive) marker (AM), or (ii) a marker of the progressive form of verbs. Contrary to Mutaka and Chie (2006) who argue that vowel raising “...is the result of the association of the floating features [+hi, +ATR, +bk] which constitute the underlying features of the vowel í

that never surfaces after the  $\eta$  sound”, I propose that vowel raising is conditioned by the [+hi, +bk] features of the velar nasal, which relink to the vowel as part of the  $\eta$ -deletion process. Notice how the [+bk] feature persists and ensures that \*a > o [ɔ] instead of ə. This synchronic process mirrors a diachronic change that happened in the language. A number of Proto-Grassfields coda consonants have been lost in Babanki and as shown in (9a-b) this was followed by the raising of the open-syllable root vowels, /a/ and /o/ to [o] and [u] respectively.<sup>12</sup> It happens then that when  $\eta$  drops out in the contexts above, leaving /a/ and /o/ in open syllables of roots they are also raised in a similar manner.

(9)	a.	əkó	‘money’	*káb`
		ésù	‘to stab’	*sòb
	b.	èlò	‘bridge’	*dàl`
		zhù	‘snake’	*yól
	c.	échò	‘surpass’	*chà
		bò	‘two’	*bà
		kəmbó	‘madness’	*bá
	d	əkú	‘forest’	*kó`
		kəvú	‘hand’	*bó`
		məntú	‘intestines’	*tó`

A traditional input-output account will formalize the following coda consonant deletion rule,

(10) Coda Consonant Deletion

$$[+ \text{cons}] \rightarrow \emptyset / V \_ \# V$$

but will be unable to formulate one for vowel raising particularly because of the difficulty to be encountered in stating the conditioning environment. To overcome the challenge I propose that the alternations are best explained by allomorphs inserted in specific frames. The data in (7) show that the nouns (a-d) and verbs (e-f) each have an

<sup>12</sup> This claim that \*a > o and \*o > u in open syllables finds support in other Central Ring Grassfields languages e.g. \*-fá` > kə-fó 'thing' (cf. Oku kə-fā), \*-bó` > kə-vú 'hand' (cf. Oku kə-wô).

allomorph whose velar nasal has been deleted and its vowel has been raised. It is inserted in the following frame.

(11)	-sáŋ ‘corn’	-kòŋ ‘like’
	Allomorphs: [so, saŋ]	[ku, kɔŋ]
	[so] / [ _ #ə] <sub>[Frame 1]</sub>	[ku] / [ _ #ə] <sub>[Frame 1]</sub>
	[saŋ]	[kɔŋ]

The data in (8) show that there is a second allomorph with deletion and no vowel raising which requires a second frame given in (12).

(12)	-ŋgan ‘story’	-lon ‘beg’
	Allomorphs: [ŋga, ŋgan]	[lɔ, lɔn]
	[ŋga] / [ _ #V] <sub>[Frame 2]</sub>	[lɔ] / [ _ #V] <sub>[Frame 2]</sub>
	[ŋgan]	[lɔn]

The most specific insertion context of the allomorph that has undergone /ŋ/ deletion and vowel raising takes precedence in Frame 1 (11) while that of deletion without vowel raising does so in Frame 2 (12). Following that, the more general allomorph that has the nasal is then inserted elsewhere (Kiparsky 1973).

The allomorph approach is further justified by the fact that while the nasals obligatorily drop as illustrated above, there are coda consonants whose deletion is not predictable and should best be viewed as allomorphs. I present these cases, represented in group 2, in (5.2).

## 5.2 Group 2: Deletion in exceptional lexical items

While group 2 confirms that deletion is lexical, it is exceptional in that it contains instances of the deletion of /n/, /ŋ/, /f/ and /s/ only in some lexical items. In the following subsections I present these by coda consonant.

### 5.2.1 Deletion of /n/

The alveolar nasal exceptionally drops out in the following grammatical words:

- (13) a. vèwé: zhíó            ‘they are eating’  
           vèwénó        zhí    ə  
           3p            eat    PROG
- b. wù tsíó fé:            ‘where do you live?’  
           wù    tsí    ə        féno  
           2s    live    PROG where
- c. wù kú?ó zé:            ‘when are you coming up?’  
           wù    kú?    ə        zéno  
           2s    climb    PROG when
- d. wù yì ghòm álé:        ‘how did you beat?’  
           wù    yì        ghòm    álénó  
           2s    P2        beat    how

### 5.2.2 Deletion of /ʔ/

The glottal stop is deleted in Babanki in only one deverbal adjective **ghó?** ‘big’ as shown in the following examples.

- (14) a. nyàmó <sup>l</sup>ghó:            ‘a big animal’  
           nyàm            é        ghó?    ə  
           animal        SM    big    PROG
- b. kàtyí <sup>l</sup>ká ghó:<sup>l</sup>ká        ‘a big stick’  
           kàtyí ` ká        ghó?    ə        ká  
           stick    SM    big    PROG AM
- c. nyàm yì ghó? má: mbá?ló    ‘an animal grew fat and I sold’  
           nyàm            yì        ghó?    mà    é        m-bá?-ló  
           animal        P2        big    1s    SM    N-sell-EXT
- d. kàtyí <sup>l</sup>ká tè ghó? mà kòŋ    ‘a stick became big and pleased me’  
           kàtyí ` ká        tè        ghó?    mà    kòŋ  
           stick    SM    P3        big    1s    like

This is an exceptional property of the adjective form only, not of the progressive as the glottal stop is retained in progressive forms.

- (15) nyàmó <sup>l</sup>ghó?ó            ‘the animal is big/the animal is becoming big’  
           nyàm            é        ghó?    ə  
           animal        SM    big    PROG

### 5.2.3 Deletion of /f/

Two deverbal adjectives **dyə̀f** ‘long’ and **byí́f** ‘bad’ obligatorily lose their /f/ as follows:

- (16) a. wíʔé dyə̀: ‘a tall person’  
           wíʔ          é          dyə̀f ə  
           person      SM      long  PROG
- b. kə̀tyí ʔkə̀ dyə̀:ʔkə̀ ‘a long stick’  
           kə̀tyí ʔkə̀      dyə̀f ə      kə̀  
           stick  SM      long  PROG  AM
- c. nyàmé ʔbyí: ‘a bad animal’  
           nyàm          é          byí́f ə  
           animal      SM      bad   PROG
- d. víʔʔvə̀ byí:ʔvə̀ ‘bad people’  
           víʔí          və̀      byí́f ə      və̀  
           people      SM      bad   PROG  AM
- (17) a. nyàmé chófé ‘wild animal’  
           nyàm          é          chóf ə  
           animal      SM      wild  PROG
- b. kə̀shí kə̀ ʔzáfé ‘a wound is hurting’  
           kə̀shí          kə̀      záf ə  
           wound      SM      hurt  PROG

The deletion of /f/ is shown in (16) while (17) shows that other deverbal adjectives do not undergo deletion of their coda /f/ in the same phonological environment.

### 5.2.4 Deletion of /s/

The voiceless alveolar fricative is deleted only when the first person plural exclusive pronoun *yès* occurs before /ə/.

- (18) a. yě: kù: ‘we are loving’  
           yès          é          kòŋ ə  
           1p(EXCL)  SM      love  PROG
- b. yě: shwó: ‘we are sucking’  
           yès          é          shwóŋ          ə  
           1p(EXCL)  SM      suck          PROG

- c.    nyàmé kó t̀ k̀n̄ ỳès        ‘the animal didn’t like us’  
       nyàm        é        kó`    t̀        k̀n̄    ỳès  
       animal      SM    NEG   P3      love   1p(EXCL)
- d.    ỳès t̀ shẃón̄ ‘we sucked’  
       ỳès        t̀        shẃón̄  
       1p(EXCL)   P3      suck

In (18a-b) *s* drops when the subject pronoun is followed by /ə/ and in (c-d) it does not drop when it occurs finally or is followed by a consonant.

The behavior of group 2 must be accounted for by allomorph selection because deletion takes place only in a few words. For example, *ỳès* ‘we’ must be listed with two allomorphs: [yɛ] and [ỳès] and the former will be inserted in Frame 1 as follows:

- (19)                    yes ‘we’  
       Allomorphs: [yɛ, ỳès]  
                           [yɛ] / [ \_ #ə]<sub>[Frame 1]</sub>  
                           ỳès

In the next two sections I show that when /ŋ/ is deleted in similar contexts like in group 1, vowel raising does not occur. While this is accounted for using Frame 2, it raises doubts about the account of vowel raising shown to accompany /ŋ/ deletion.

### 5.3. Group 3: Deletion of /ŋ/ and /n/ without vowel raising

Group 3 is made up of contexts where deletion is conditioned by special properties of the stems involved. First, note in (20a) that vowel raising is blocked when the input is /Cwəŋ/ or /Cwɔŋ/:

- (20) a.    CwVŋ Sequence in both nouns and verbs  
           kəfwā: kóm        ‘my animal tract’        /kəfwáŋ ə kóm/  
           mbwô: ghóm        ‘my maggot’            /mbwón̄ ə ghóm/
- b.    Personal and Animal Names  
       mənà: ghóm        ‘my Menang’            /mənàŋ ə ghóm/  
       ŋgô: ghóm        ‘my Ngong’            /ŋgón̄ ə ghóm/
- c.    Disyllabic Roots  
       kənsāŋsā: kóm        ‘my sugarcane’        /kənsáŋsáŋ ə kóm/  
       kəŋgōŋgō: kóm        ‘my ant’                /kəŋgón̄gón̄ ə kóm/

The failure of the resulting Cwa and Cwo to be raised after /ŋ/ deletion is related to the fact that the sequence [Cwu] is disallowed in the language. The examples in (20b) show that personal names resist raising, presumably to keep the name more faithful to its pronunciation in isolation. The restriction is such that a name should not be changed extensively because if after consonant deletion the vowel is also changed the name will sound too different.<sup>13</sup> The disyllabic roots in (20c) are reduplications: In this case, there is a constraint to keep the vowel identical in both the stem and the reduplicant. A personal or animal name or a reduplication can be viewed as a fixed form that cannot be tampered with and so do not contradict the diachronic analysis of vowel raising provided above. The examples in (21) show similar examples involving /CwVn/ stems, which would in any case not have been expected to undergo raising after /n/ deletion:

(21) a. CwVn Sequence in both nouns and verbs

èfwā: ghómé	‘my stream’	/èfwán è ghómé/
mà chwá:	‘I am cutting’	/mà chwán-é/

b. Personal Names

àbà: ghóm	‘my Abain’	/àbàn è ghóm/
ŋgò: ghóm	‘my Ngoin’	/ŋgòn è ghóm/

c. Disyllabic Roots

kèmbāmbā: kóm	‘my Adam fruit’	/kèmbábán è kóm/
fèŋgwǒbà: fwóm	‘my monitor lizard’	/fèŋgwǒbàn è fwóm/

#### 5.4. Group 4: Deletion of /ŋ/ and /n/ before /a/

Group 3 contains a number of morphemes of the shape /á/. They include the post-nominal demonstrative pronoun **á-Ci**, the relative clause marker /á/ which also occurs after the noun, two prepositions: locative/adverbial /á/, indirect object /à/, and the yes-no question marker /à/. It is evident that what they have in common is that the vowel that follows the noun is [a] rather than [ə]. In this case, there is deletion of the nasals without any vowel raising as shown in the following sets of data.

<sup>13</sup> Surprisingly the name of the supreme God undergoes both **ŋ** deletion and vowel raising nyìngù: ghóm ‘my God’ /nyìngù è ghóm/. This is probably because it is not possible to confuse this name with any other name in the language.

(22) Noun + Demonstrative Pronoun /á-Ci/<sup>14</sup> the ‘one referred to’

- |    |         |                      |             |
|----|---------|----------------------|-------------|
| a. | mbă: yì | ‘that walking stick’ | /mbàŋ á-yì/ |
|    | ndǔ: yì | ‘that potato’        | /ndòŋ á-yì/ |
| b. | wǎ: yì  | ‘that child’         | /wàn á-yì / |
|    | fǔ: yì  | ‘that fon (king)’    | /fòn á-yì/  |

(23) Relative Clauses

- |    |                   |                                |                     |
|----|-------------------|--------------------------------|---------------------|
| a. | àsā: ghē: fəŋkè   | ‘the corn that is falling’     | /àsáŋ á ghé fəŋkə/  |
|    | àghō: ghē fəŋkè   | ‘the spears that are falling’  | /àghóŋ á ghé fəŋkə/ |
| b. | kǎ: mà pfiʔá      | ‘the monkey that I am eating’  | /kàn á mà pfiʔá/    |
|    | ntǔ: mà báʔlè     | ‘the pot that I am selling’    | /ntòn á mà báʔlə/   |
| c. | kətyóm á ká fəŋkè | ‘the calabash that is falling’ | /kətyóm á ká fəŋkə/ |
|    | kətám á mà báʔlè  | ‘the trap that I am selling’   | /kətám á mà báʔlə/  |

(24) Prepositional Phrases

- |    |                        |                           |                            |
|----|------------------------|---------------------------|----------------------------|
| a. | kú mbà: mò             | ‘give me a walking stick’ | /kú mbàŋ à mò/             |
|    | mà yì tèm ághó: kəʔbəŋ | ‘I shot spears outside’   | /mà yì tèm àghóŋ á kəbəŋ/  |
| b. | kú nà: mò              | ‘give me happiness’       | /kú nàn à mò/              |
|    | mà kə: pfiʔə ntò: wù   | ‘I want to cook for you’  | /mà kəŋ ə pfiʔə ntòn à wù/ |

(25) Locative and adverbial Phrases

- |    |            |               |                |
|----|------------|---------------|----------------|
| a. | fá: shè    | ‘remain here’ | /fáŋ á shè/    |
|    | tsó: ŋkàyn | ‘steal well’  | /tsóŋ á ŋkàyn/ |
| b. | bá: shè    | ‘nail here’   | /bán á shè/    |
|    | só: ŋkàyn  | ‘fight well’  | /són á ŋkàyn/  |

(26) Indirect Object

- |    |            |                     |                |
|----|------------|---------------------|----------------|
| a. | kú: sâ: mò | ‘give me corn’      | /kú əsáŋ à mò/ |
|    | kú ndò: mò | ‘give me potato’    | /kú ndòŋ à mò/ |
| b. | kú nà: mò  | ‘give me happiness’ | /kú nàn à mò/  |
|    | kú ntò: mò | ‘give me a pot’     | /kú ntòn à mò/ |

<sup>14</sup> The consonant depends on the noun class of the modified noun. It is [y] for classes 1, 3, 5, 6, and 9; [v] for classes 2 and 8; [m] for class 6a; [k] for class 7; [j] for class 10; [t] for class 13; and [f] for class 19.



(27) Yes-No Questions

- |    |                  |                              |                      |
|----|------------------|------------------------------|----------------------|
| a. | wù tề vì nề mbà: | ‘Did you come with a stick?’ | /wù tề vì nề mbàŋ à/ |
|    | mà kú: ndò:      | ‘Should I give potato?’      | /mà kú ndòŋ à/       |
| b. | wù tề vì nề wà:  | ‘Did you come with a child?’ | /wù tề vì nề wàn’ à/ |
|    | mà kú: ntò:      | ‘Should I give a pot?’       | /mà kú ntòn à/       |

Vowel raising fails to apply here because of the complex nature of the structures in which it occurs. Note that the demonstrative pronoun in (22) is the only one that has the **á-Ci** bimorphemic structure, the others being **CV(C)** as can be seen in (28).

(28) Demonstrative Pronouns

- |          |                                                       |
|----------|-------------------------------------------------------|
| mbàŋ yèn | ‘this stick (near speaker)’                           |
| fɔ̃n yì  | ‘that fon (near listener, far from speaker/listener)’ |
| nyàm áyì | ‘that animal (the ‘one referred to’)                  |

The rest of the constructions that make up group 4 are considered to have a real boundary between them and therefore are postlexical, disallowing raising which is a lexical process.

**5.5 Group 5: Deletion of /ŋ/ and /n/ in major argument relations**

Group 5 contains instances of deletion between a subject and its agreement marker, between a verb and its object, and in serial verbs.

(29) a1. Subject Pro(noun) + Agreement

ghě:	vìè	‘you are coming’
ghèŋ	é	vì    ə
2p	SM	come PROG

a2.	tsǎ:	vìè	‘a thief is coming’
	tsòŋ	é	vì    ə
	thief	SM	come PROG

b1.	kǎ:	fəŋkè	‘a monkey is falling’
	kàn	é	fəŋ-kè
	monkey	SM	fall-EXT

b2.	ntǎ:	fəŋkè	‘a pot is falling’
	ntòn	é	fəŋ-kè
	pot	SM	fall-EXT

- (30) a. Immediate Future Tense<sup>15</sup>  
 əsá: fwè ‘the corn will rot’ /ə́sáŋ á fwè/  
 ndǔ: fwè ‘the potato will rot’ /ndòŋ á fwè/
- b. kǎ: kùm ‘a monkey will touch’ /kàn á kùm/  
 ntǔ: bòn ‘the pot will be nice’ /ntòn á bòn/
- (31) a. Verb + Object  
 mà kē: ká: ʼsán ‘I want to fry corn’ /mà kəŋ ə kán ə́sán/  
 kǔ: mō ‘love me’ /kòŋ-ə mò/  
 b. mà kē: tí: ʼlém ‘I want to cut yams’ /mà kəŋ ə tɪn ə́lém/  
 ló: ʼwén ‘beg him’ /lón-ə wén/
- (32) a. Serial Verbs  
 kâ: pǫ? ‘fry and chew’ /kán ə pǫ?/  
 bô: pǫ? ‘pick and chew’ /bón ə pǫ?/  
 bô: kâ: pǫ? ‘pick, fry and chew’ /bón ə kán ə pǫ?/  
 b. chwá: pǫ? ‘cutting and chewing’ /chwán ə pǫ?/  
 ló: pǫ? ‘begging and chewing’ /lón ə pǫ?/  
 chwá: ló: pǫ? ‘cutting, begging and chewing’ /chwán ə lón ə pǫ?/

The nasals are deleted as expected but vowel raising does not occur with ŋ-deletion even when the nasals are followed by schwa. Like group, this further shows that vowel raising can be predicted by a consistent difference in syntactic structure. How can one explain raising in ə́sú: nyàm ‘animal’s tooth’ from /ə́són ə́ nyàm/ but not in tsǔ: vìè ‘a thief is coming’ from /tsòŋ ə́ vì ə/ with identical phonological composition? In the case of ‘noun of noun’ and ‘noun of me’ (cf. 5) expressing ownership, the schwa goes onto the preceding noun as a clitic whereas in arguments (29-32) there is a major boundary between the verb and the argument of the clause. This relationship is expressed in the former allowing raising and the latter prohibiting it.

## 5.6 Group 6: Deletion of /ŋ/ and /n/ in the imperative

Group 6 contains imperative forms with their unique behavior captured by the following data.

<sup>15</sup> The immediate future is the only one in Babanki marked by [a]. The tense markers in the language are immediate past [lí], hordienal past [yì], distant past [tə̀], remote past [N], present tense [ø], immediate future [á], hordienal future [né] and remote future [lú].



## 6 Conclusion

In this study, I have shown that there are many contexts in Babanki where five of the six coda consonants are deleted in intervocalic position. The deletion of /ŋ/ is accompanied by the raising of /a/ and /o/ to [o] and [u] respectively. It has also been shown that the raising process happened diachronically in the language when these two vowels were in open syllables of roots. It has been argued that these morphophonological processes cannot be captured by phonological rules, and a solution that lists allomorphs with appropriate frames where they are inserted has been proposed. The study has therefore provided support for precompiled phrasal phonology (Hayes 1990) in which allomorphs are listed with appropriate frames where they are inserted.

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