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Numeral mutation and ablaut in Lower Fungom languages

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Abstract

This paper provides new information on patterns of consonant mutation and vowel ablaut found in the numeral systems of four language varieties of the Lower Fungom region of Cameroon. This phenomenon is of interest in the context of the comparative investigation of noun class marking in Niger-Congo languages, and a particularly noteworthy pattern found in some of the varieties are apparent cases of mutated numeral roots being analogically extended to contexts where they would not be predicted to be found on the basis of regular patterns of sound change.

Keywords: numerals, consonant mutation, ablaut, Bantoid

1 Introduction

This article examines consonant mutation and vowel ablaut in numerals showing noun class agreement in the languages of the Lower Fungom region of Cameroon, which is located within the Cameroonian Grassfields.¹ According to Merrill (2018: 1), “consonant mutation is a linguistic phenomenon whereby two or more sets of consonant phonemes alternate systematically within roots (or other morphemes) in a way that is not entirely predictable from the phonological environment”. Additionally, Kroeger (2005: 307–308), writes that, “[m]utation refers to a change in the quality of one or more phonemes in the base form. Vowel mutation is relatively common, and is often referred to by the more specific term ablaut.” The term ‘mutation’ will be used as a general label encompassing both conso-

¹ The first author had the primary responsibility for the data collection and analysis that underlies this paper, and he also created the first draft of the work. The second author contributed to the analysis, editing of the final text and addressing aspects of reviewer feedback.

nant mutation and ablaut in this paper, and *ablaut* will be used specifically for mutations involving vowels.

An initial example of the phenomena of interest here can be found in the Lower Fungom variety Buu. The elicitation form of the number ‘one’ is *mō*, and this is the root for ‘one’ that is found when the number appears with a noun class agreement prefix. However, in some classes, there is no agreement prefix, and the word for ‘one’ shows agreement with the noun via both numeral mutation and ablaut, as seen for the class 3 noun *kpūn* in the phrase *kpūn nōō* ‘one tree’, where *n* is found, rather than *m*, and *uo*, rather than *o*, in the numeral modifier.²

This paper is intended to be largely descriptive in orientation. The data of focus has been collected as part of ongoing research on the thirteen language varieties of Lower Fungom. Previous work has looked at consonant mutation and ablaut in just two of the region’s thirteen varieties. For Mundabli, Voll (2017: 71–72, 152) discusses consonant mutation and vowel ablaut in numerals. For Koshin, Ousmanou (2014: 148–149) provides data on initial consonant alternations in the numerals 100 and 200. In his general survey of consonant mutation in Grassfields languages, Kießling (2010: 210) discusses consonant mutation in nouns in Koshin, based on data provided in Hombert (1980: 89), but not in numerals. Therefore, while the material presented in this paper overlaps with earlier work on the Lower Fungom varieties, substantial new information is provided as well.

The rest of this paper is organized as follows. In section 2, the general linguistic situation of Lower Fungom is briefly presented. In section 3, some overall patterns are discussed regarding the presence or absence of numeral mutation in Lower Fungom varieties, and the historical sources of mutation are briefly considered. In section 4, the numeral systems of the four language varieties of Lower Fungom where mutation is found are presented. A brief conclusion is provided in section 5. This paper presupposes that the reader has basic familiarity with Bantoid noun class systems. For those without the relevant background, Kießling’s (2010) study of mutation patterns in other Grassfields languages provides relevant information in a study

² Depending on the details of the agreement constructions, there may also be tone changes which could be considered an additional kind of mutation. This is seen in the example just discussed where the tone on the citation form for ‘one’ differs from the tone in the class 3 form for ‘one’. In this paper, we consider only segmental mutations, and leave tonal alternations for future study.

whose goals overlap with the present paper. A more general overview of Niger-Congo noun class systems from a diachronic and comparative perspective can be found in Good (2012).

2 Lower Fungom: A brief linguistic overview

The Lower Fungom area of the North West Region of Cameroon comprises thirteen villages (see Good et al. 2011). Each village is associated with a distinct linguistic variety. Current reference classifications group these varieties into seven languages. Four of the varieties show the segmental mutation patterns of interest to this paper, namely Buu, Mufu, Mundabli, and Mashi. Mufu and Mundabli are closely related varieties. Buu shows evidence of a close historical connection to Mufu and Mundabli but is quite different from them and, despite the fact that these three varieties are treated as a single language in reference sources, current evidence suggests that Buu should be treated as one language and Mufu-Mundabli as another (see Good et al. under review). The Mashi variety of Naki is not linguistically close to the other three varieties in the local context (though all of Lower Fungom's languages are related at some level within Bantoid). Figure 1 provides a map of Lower Fungom and the immediately surrounding region. Table 1 provides a list of its villages with an indication of their names and reference language codes. The names of varieties where numeral consonant mutation is attested are italicized in the table.

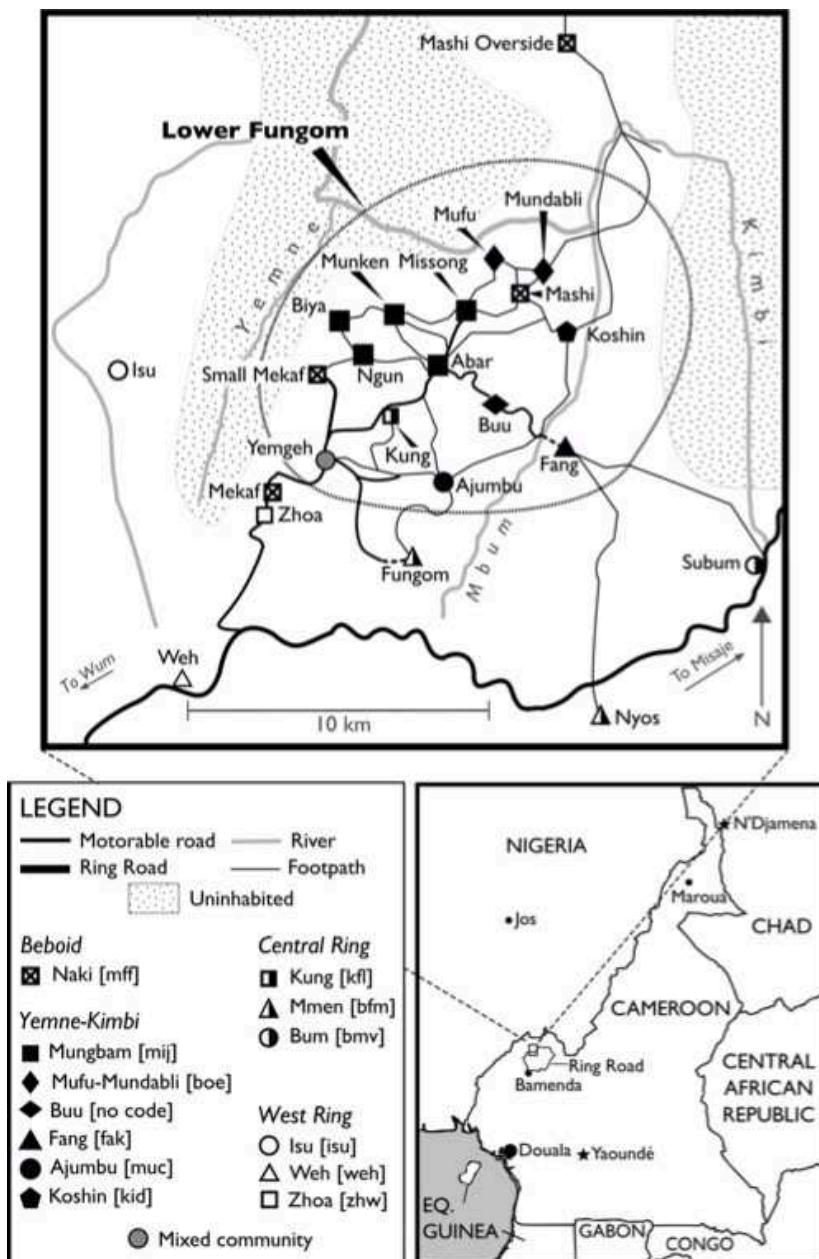


Figure 1: Villages and language varieties of Lower Fungom. Map created by Pierpaolo Di Carlo.

Table 1. Language varieties of Lower Fungom

Language	Variety (if applicable)	639-3 code	Glottocode
Mungbam	Abar	mij	abar1238
	Biya	mij	biya1235
	Missong	mij	miss1255
	Munken	mij	munk1244
	Ngun	mij	ngun1279
<i>Buu</i>		—	buuu1246
Mufu- Mundabli	<i>Mufu</i>	boe	mufu1234
	<i>Mundabli</i>	boe	mund1340
Ajumbu		muc	mbuu1238
Fang		fak	fang1248
Koshin		kid	kosh1246
Naki	<i>Mashi</i>	mff	nak1238
Kung		kfl	kung1292

3 General patterns in the distribution of mutation and its historical origins

A general descriptive point that emerges when all of the Lower Fungom languages are considered together is that mutation in numerals is clearly connected to the noun class system, and its historical source is from alternations triggered by the presence of noun class prefixes on agreeing numerals. In some cases, the prefixes triggering mutation are still present, but, in others, they have been lost (see Kießling 2010).

For purposes of comparison, schematic overviews of the noun class systems of Abar—a variety lacking mutation in numerals—are presented alongside those of Mundabli and Mashi—varieties where mutation is found. The overviews include a noun class number (CL) which broadly follows general Bantuist conventions, the form of the noun class coding as found on nouns (most often a prefix, i.e. PFX), and an indication of the general shape of the initial consonant of forms that agree with nouns (AGR), including whether these forms are generally associated with a higher or lower tone (with the precise

tonal realization depending on the specific forms involved). Shaded cells are used in cases when no corresponding noun class has been found in the relevant variety. Superscript *w* and *y* are used for cases where the singular/plural distinction on a small set of nouns is coded via initial consonant mutations involving a shift from labial-velar stops to coronal affricates (Voll 2017: 92). (While this is a minor pattern in Mundabli, it is included here due to its interest as another instance of mutation.) A capital C is used for a consonant whose form is depending on the final segment of the stem which a suffix that is part of the class-marking system attaches to. A capital N is used for a nasal that assimilates in place to the following consonant. As seen in the table, while Abar nouns generally show noun class prefixes, this is not the case for Mundabli and Mashi. However, contemporary patterns of mutation are clearly connected to the historical presence of these noun class markers, whether or not they are still attested. The forms in the table in largely follow (Good et al. 2011), with additional information drawn from Lovegren (2013: 138).

As outlined in Kießling (2010b: 203), the development of mutations as part of the encoding of noun class systems is linked to the presence of vowels in prefixes that influenced the articulation of consonants and vowels in the stem that they appeared with. Even when these vowels are lost, the alternations that they conditioned can remain, resulting in synchronic patterns of mutation (see also Merrill, 2018: 68). It is worth noting that semantics does not appear to play a role in patterns of numeral mutation. Nouns for human and non-humans in a given noun class behave the same way with respect to mutation alternations. In Table 2 below you would find the schematic overview of the noun classes of Abar, Mundabli and Mashi drawn from Good et al. (2011: 23, 34, 54) since ablaut correlates with the nature of the noun class prefix.

Table 2. Schematic overview of Abar, Mundabli and Mashi noun class systems

Abar			Mundabli			Mashi		
CL	PFX	AGR	CL	PFX	AGR	CL	PFX	AGR
1	ù-/ø-	w` -	1	Ø-	w` -	1	Ø-	w` -
2	bə-/a-	bw` -	2	bə-	b` -	2	bu-	b` -
3	ú-	w` -	3	w-	w` -	3	Ø-	w` -
4	í-	y` -	4	y-	y` -			
5	ì-	y` -	5	Ø-	w` -			
6	aN-/məN-	mq` -				6	ø/-ŋ	n` -
4a	í-	y` -						
7a	kə...(-lɔ)	ky` -	7a	Ø-	k` -			
12	kə-/a-	k` -	7	Ø-	k` -	7	a-	k` -
8	bi-/í-	by` -	8	Ø-	b` -	8	bi-	b` -
9	ì-	y` -	9	-`	y` -	9	-`	y` -
10	í -	y` -	10	-'	y` -	10	-'	y` -
19	shi-	sh` -	19	fí-	f` -	19	fi-	fy` -
18a	mN-	m` -	18	mù-	m` -	18	N-	m` -
6a	aN-/N-	mq` - /mw-	6a	N-	m` -	6a	N-	m` -
14	bu-/ú-	bw` -	14	Ø-	b` -	14	u-	w` -

4 Data collection methodology

This paper presents results of a larger study examining individual-based lexical and grammatical variation among languages of Lower Fungom (see Good et al. under review).³ Part of this work has involved extensive elicitation with speakers of Lower Fungom's thirteen linguistic varieties using a standardized wordlist and set of grammatical elicitation prompts, including those designed to look for agreement patterns in numerals, in particular the numerals from

³ The recordings of the data collection on which this study relies are deposited at Tschonghongei (2024).

‘one’ to ‘ten’.⁴ This allows us to verify previously reported patterns and to present newly discovered ones. As discussed in section 1, Voll (2017) previously described numeral mutation in Mundabli, which she found for numerals ‘one’, ‘two’, and ‘three’. Our data collection largely verifies her earlier findings, but with some differences, as discussed below.⁵

In the rest of this section, we present an overview of our findings across each of the four varieties where mutation is found in numerals, with section 4.1 focusing on Buu, section 4.2 on Mufu, section 4.3 on Mundabli, and section 4.4 on Mashi.

4.1 Buu

In Buu, numeral mutation is found in classes 1, 3, 4, 9, and 10, and in numerals ‘one’, ‘two’, and ‘three’. This can be seen in Table 3, which provides the forms of the numerals from one to ten across Buu’s noun classes. Forms which show mutation in comparison to the listed citation forms of the numerals are bolded. As can be seen in the table, numerals between ‘one’ and ‘eight’ show agreement with the noun they modify, while the forms for ‘nine’ and ‘ten’ are invariant. Because the first member of the class pairings in the table represents singular nouns, the agreement forms for ‘one’ only apply to that member of the pairing, while the agreement classes for the other numbers apply to the second member of the pairings, since these are plural classes. In the data used in this study, there was additional individual-based variation of clear interest. Specifically, some speakers also provided a mutated form of the stem as the citation form, namely *núō:* for ‘one’, *þé:* for ‘two’ and *tsā:* for ‘three’.

⁴ Systematically analyzing the cases of individual-based variation discovered during the course of the larger study is outside of the scope of this paper, though this is discussed to a limited extent for the Buu variety in section 4.2. In those cases where consultants did not produce the same forms as each other for the data of focus in this paper, representative consultants were chosen favoring those who lived longer within the village that a given variety is associated with and who were married to another individual from that same village.

⁵ One other case of mutation in a numeral system is noted in Ousmanou’s (2014) study of Koshin. Specifically, mutation is found between the singular and plural forms of the numeral for ‘hundred’. This is not considered in detail here since it is not connected to agreement but, rather, is an instance of a nominal singular/plural alternation. The relevant forms are *gbī* ‘hundred’ and *dzī* ‘hundreds’, and this numeral in Koshin grammatically behaves like a regular noun (Ousmanou 2014: 37).

Table 3. Buu numeral mutation patterns

	‘one’	‘two’	‘three’	‘four’	‘five’	‘six’	‘seven’	‘eight’	‘nine’	‘ten’
CITATION	<i>mᾶ</i>	<i>j̥ē:</i>	<i>tᾶ</i>	<i>j̥älâ</i>	<i>kpâmâ</i>	<i>tâlâ</i>	<i>nêtâ</i>	<i>nâmâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
1/2	<i>jnûō:</i>	<i>b̥əf̥ē:</i>	<i>bâtâ:</i>	<i>b̥əj̥âlâ</i>	<i>kpâmâ</i>	<i>bâtâlâ</i>	<i>bâñetâ:</i>	<i>bâñennâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
3/4	<i>jnûō:</i>	<i>j̥ē:</i>	<i>t̥â:</i>	<i>j̥älâ</i>	<i>kpâmâ</i>	<i>tâlâ</i>	<i>nêtâ</i>	<i>nâmâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
3/7a	<i>jnûō:</i>	<i>k̥ef̥ē:</i>	<i>kôtâ:</i>	<i>k̥əj̥âlâ</i>	<i>kpâmâ</i>	<i>kâtâlâ</i>	<i>kâñetâ:</i>	<i>kâñennâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
7/8	<i>kâmô:</i>	<i>b̥əf̥ē:</i>	<i>bâtâ:</i>	<i>b̥əj̥âlâ</i>	<i>kpâmâ</i>	<i>bâtâlâ</i>	<i>bâñetâ:</i>	<i>bâñennâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
9/10	<i>jnûō:</i>	<i>j̥ē:</i>	<i>t̥â:</i>	<i>j̥älâ</i>	<i>kpâmâ</i>	<i>tâlâ</i>	<i>nêtâ</i>	<i>nâmâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>
19/18a	<i>fâmô:</i>	<i>mâm̥j̥ē:</i>	<i>mântâ:</i>	<i>mâñâlâ</i>	<i>kpâmâ</i>	<i>mântâlâ</i>	<i>mâñetâ</i>	<i>mâñennâ</i>	<i>kpântâbâñi</i>	<i>dʒōj̥â</i>

As can be seen in Table 3, mutation for ‘one’ involves a mix of consonant mutation and ablaut, while for ‘two’ and ‘three’, only consonant mutation is involved. These patterns of mutation seem to represent the final diachronic stage for the development of such mutations in languages of the Grassfields area as proposed by Kießling (2010: 203), where an original segmental agreement prefix is lost, and mutation is the sole reflex of its former presence. The specific forms of the mutations are understandable in light of the reconstructions of the noun class prefixes for classes 1, 3, 4, and 9, where classes 1 and 3 are associated with a **u-* and classes 4 and 9 with an **i-* (see, e.g. Hyman 1980: 179). The **u-* has led to labialization (in the form of an *u*) in the relevant class 1 and 3 forms for ‘one’, and the **i-* has led to palatalization in the relevant class 4 and class 9 forms. The class 1 and 3 forms have been impacted by a secondary process of palatalization of their initial consonant. While the precise phonetic basis for this is not completely clear, labialization of the vowel accompanied by palatalization of the consonant has been found elsewhere in the region, namely in the Central Ring language Mmen (Kießling 2010: 195), though in the case of Mmen sibilants are targeted rather than a nasal.

4.2 Mufu

In Mufu, mutation in numerals is seen in classes 1, 4, 9, and 10, in the numerals for ‘one’ and ‘two’. The agreement patterns for the numerals from ‘one’ to ‘ten’ are presented in Table 4. Forms showing mutation in comparison to the citation forms are bolded. Agreement is found on all numerals in the data except for ‘ten’.

Mutation in Mufu involves labialization and vowel ablaut for the number ‘one’, where the form shifts from *mó?* to *mwò:*. Part of this shift also involves a change in the syllable structure from a closed to open syllable. It is not clear at the moment how best to analyze this aspect of the change since descriptive work on Mufu remains limited. The closely related variety of Mundabli has pharyngealized vowels, and cognates for these roots in Mufu often have coda consonants (Voll 2017: 42). It is possible that some phonetic coda consonants in Mufu could instead be analyzed phonemically as encoding distinct vowel qualities (in this case, a glottalized vowel) as a transitional stage between phonemic coda consonants and the full phonetic integration of glottalization into the preceding vowel. Under such an

analysis, the loss of the glottal stop in the forms *úmwò:* and *yímwó:* could be considered to be part of an ablaut process. For ‘two’, mutation involves palatalization of the consonant in the numeral stem.

In the Mufu case, the numerals showing mutations also retain agreement prefixes, and the process can be seen as less advanced than in Buu in the diachronic model of Kießling (2010: 203). At the same time, the process is not phonologically predictable since the class 3 form for ‘one’ does not show any alternation despite having a prefix of the same form as class 1. More surprisingly, the class 9 form appears with a root that appears to have been labialized historically even though the class 9 prefix does not contain a round vowel. This suggests its root has developed via some process other than regular sound change, such as analogy. Taken together, even if these alternations may be partly predictable in some forms, there is also evidence that they have phonologized and morphologized along the lines of what one would expect for segment mutations.

Another interesting historical question is raised by the comparison of the class 7a and 8 forms against the class 4 and 10 forms for ‘two’. These forms show the same synchronic phonological environment with a high front vowel appearing before the first consonant of the stem, but a mutation is only found in the class 4 and 10 forms. It is not clear whether these can be accounted for via sound change (e.g. if the *i* vowels in the prefixes have different historical sources) or some other explanations is required.

Table 4. Mufu numeral mutation patterns

	‘one’	‘two’	‘three’	‘four’	‘five’	‘six’	‘seven’	‘eight’	‘nine’	‘ten’
CITATION	<i>mǎ?</i>	<i>fyē</i>	<i>tá</i>	<i>ndē</i>	<i>kpān</i>	<i>tsítá</i> ~ <i>titá</i>	<i>nōrtā</i>	<i>nēnè</i>	<i>kpēnè</i>	<i>gñóyñ</i>
1/2	<i>òmwò:</i>	<i>báyé:</i>	<i>báta:</i>	<i>bàndé:</i>	<i>bàkpán</i>	<i>bàtsítá</i>	<i>bànrötā:</i>	<i>bànenè</i>	<i>bàkpé?nè</i>	<i>gñóyñ</i>
3/4	<i>òmwó</i>	<i>yíyé:</i>	<i>yítá:</i>	<i>yindé</i>	<i>yíkpán</i>	<i>yítítá</i>	<i>yínrotá:</i>	<i>ménè</i>	<i>ikpēnè</i>	<i>gñóyñ</i>
3/7a	<i>òmž?</i>	<i>kífyé</i>	<i>kítá:</i>	<i>kíndé</i>	<i>kíkpán</i>	<i>kítsítá:</i>	<i>kínrötá:</i>	<i>kínénè</i>	<i>kíkpé?nè</i>	<i>gñóyñ</i>
7/8	<i>kímž?</i>	<i>bífyé</i>	<i>bítá</i>	<i>bíndé</i>	<i>bíkpán</i>	<i>bítsítá:</i>	<i>bínrötá:</i>	<i>bínénè</i>	<i>bíkpé?nè</i>	<i>gñóyñ</i>
9/10	<i>yímwó:</i>	<i>yíyé:</i>	<i>yítá:</i>	<i>yindé</i>	<i>yíkpán</i>	<i>ítítá:</i>	<i>yínrotá:</i>	<i>yínénè</i>	<i>yíkpé?nè</i>	<i>gñóyñ</i>
19/18a	<i>fámž?</i>	<i>múfyé:</i>	<i>mántá</i>	<i>mündé</i>	<i>múnkpán</i>	<i>múntítá</i>	<i>múnnrötá</i>	<i>múnénè</i>	<i>múnkpé?nè</i>	<i>gñóyñ</i>

4.3 Mundabli

Mundabli is the one variety reported on here where numeral mutation has already been described in an earlier source, namely Voll (2017: 72–73). Our data is largely in agreement with that of Voll (2017), but with some noteworthy differences. We have no specific explanation for these differences beyond the fact that individual-level variation is not unusual in Lower Fungom (see Good et al. *under review*) and that the forms provided by her primary consultants may simply differ from those provided by ours. Voll (2017) describes mutation patterns for the numerals ‘one’, ‘two’, and ‘three’. Classes 4 and 10 are part of the mutation pattern, as also found in Buu and Mufu. The situation for the singular classes is somewhat different since, in our data, the attested alternation does not appear to be conditioned by class but, rather, is a difference between the citation form of ‘one’ and the forms when it acts as a modifier. Voll (2017: 152) finds something comparable except, in her data, the class 7 form of ‘one’ matches the vowel of the citation form, unlike in our data.⁶ The forms we collected are provided in Table 5, and agreement is found in all numerals in the data except for ‘ten’. The forms for ‘two’ and ‘three’ showing mutation in comparison to the citation form are bolded, as are all the non-citation forms for ‘one’.

The palatalization pattern seen in the forms for ‘two’ and ‘three’ largely follows what was seen for Buu. The situation for ‘one’ is somewhat unusual in all non-citation contexts since the numeral root has the form that would be expected for forms which were historically prefixed with a *u* vowel (or a vowel with a similar quality), but this form of the root is found even for class 9, which historically is associated with an *i*. It appears as though a process of analogical leveling has impacted the agreement forms for ‘one’ in Mundabli in our data, in a more extreme version of the analogical change proposed for Mufu in section 4.2. If this proposal is correct, it suggests that, for Voll’s (2017) speakers, the process of analogy had extended to all forms except the class 7 form.

⁶ Specifically, in her data, the citation form of ‘one’ is *m̥mō* and the form showing class 7 agreement is *k̥i-mō*.

Table 5. Mundabli numeral mutation patterns

CITATION	‘one’	‘two’	‘three’	‘four’	‘five’	‘six’	‘seven’	‘eight’	‘nine’	‘ten’
	<i>mā~māñi</i>	<i>fyē</i>	<i>tɔ:</i>	<i>ndé</i>	<i>kpɔ̄n</i>	<i>tʃtā</i>	<i>nɔ̄tɔ~nɔ̄tɔ:</i>	<i>nɛ̄t̄e~nən̄t̄</i>	<i>kpáñi~kpáñiñ̄</i>	<i>dzó;f̄s̄</i>
1/2	<i>ùmùò</i>	<i>bájyé</i>	<i>bájɔ̄</i>	<i>bándé</i>	<i>bákpón</i>	<i>báʃt̄á</i>	<i>báñɔ̄t̄</i>	<i>bónàñ̄</i>	<i>bákpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>
3/4	<i>úmùò</i>	<i>yíjyé</i>	<i>yítsō</i>	<i>yíndé</i>	<i>yíkpón</i>	<i>yíʃt̄á</i>	<i>yíñɔ̄t̄ó</i>	<i>yíñàñ̄</i>	<i>yíkpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>
3/7a	<i>úmúò</i>	<i>kíjyé</i>	<i>kítɔ̄</i>	<i>kíndé</i>	<i>kákpón</i>	<i>kíʃt̄á</i>	<i>kíñɔ̄t̄ó</i>	<i>káñàñ̄</i>	<i>kákpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>
7/8	<i>kámuò</i>	<i>bíjyé</i>	<i>bítɔ̄</i>	<i>bíndé</i>	<i>bíkpón</i>	<i>bíʃt̄á</i>	<i>bíñɔ̄t̄ó</i>	<i>bíñàñ̄</i>	<i>bíkpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>
9/10	<i>yímùò</i>	<i>yíjyé</i>	<i>yítsō</i>	<i>yíndé</i>	<i>yíkpón</i>	<i>yíʃt̄á</i>	<i>yíñɔ̄t̄ó</i>	<i>yíñàñ̄</i>	<i>yíkpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>
19/18a	<i>fómúò</i>	<i>múfyé</i>	<i>múñt̄</i>	<i>múndé</i>	<i>múñkpón</i>	<i>múñʃt̄á</i>	<i>múññɔ̄t̄ó</i>	<i>múñàñ̄</i>	<i>múñkpáñ̄ñ̄</i>	<i>dzó;f̄s̄</i>

The Mundabli data also shows a pattern noted for Mufu in section 4.2, where only classes 4 and 10 are associated with consonant mutations even though they create the same phonological environment before the stem vowel of the numeral as classes 7a and 8. (In the Mundabli case, this pattern extends to ‘three’, unlike Mufu, which lacks mutations for the forms for ‘three’ entirely.) As is also the case for Mufu, we are not able to provide a historical account for this pattern here.

4.4 Mashi

Unlike Buu, Mufu, and Mundabli, which are all only associated with Lower Fungom, Mashi is a variety of the Naki language, which is also spoken outside of Lower Fungom, and which also appears to be related to a number of other languages classified as Beboid. Other Beboid languages have been described as showing mutation in numeral systems. For example, in Kemezung mutation is found in the agreement for numerals ‘one’, ‘two’, ‘three’, and ‘four’ (Smoes 2010:16). Similar patterns are found in Naami (Tabah 2020: 14–15) and Noni (Hyman 1980: 28–29). Although the data is not presented in detail, Mungong (Boutwell 2014: 13) and Nchane (Boutwell 2020: 143) show some numeral mutation as well, though in a more limited form. By contrast, another Beboid language, Mbuk (Tschonghongei 2018: 360–361) does not show any sign of numeral mutation.

The Mashi variety of Naki patterns with the Beboid languages showing a relatively high degree of mutation in their numeral systems. Mutation is found in classes 4, 9, and 10, and for numerals ‘one’, ‘two’, ‘three’, ‘four’, and ‘five’. Mashi’s numeral forms are presented in Table 5.⁷ Those forms showing mutation in comparison with the citation forms are bolded. Agreement is found only in numerals ‘one’ to ‘six’, with those from ‘seven’ to ‘ten’ being invariant.⁸

⁷ The class 18a form for ‘six’ shows an unexpected long vowel. Since this is a change in vowel length, rather than quality, we do not treat it as an example of ablaut here.

⁸ There is some variation regarding the presence of final coda consonants in some of the data in Table 10, as seen, for example, in the class 10 form for ‘two’, which lacked a code in the collected data that was found in the other forms for two. In the forms for ‘four’, some lightly articulated codes were found for the class 4 and class 10 forms. It is not clear if this variation is systematic or not based on the data available to us.

The patterns of mutation involve vowel ablaut and consonant change, or both. Ablaut is found in the cl. 9 form for ‘one’ and the cl. 4 and cl. 10 forms for ‘four’. Consonant change is found in the cl. 10 forms for ‘two’, ‘three’, ‘four’, and ‘five’, as well as the cl. 4 form for ‘five’. The cl. 10 form for ‘four’ is notable exhibiting both kinds of change. The relevant classes are those associated with a historical **i* (see section 4.1), and the changes observed are in line with that, involving vowel fronting and raising and consonant palatalization. Like Buu, numeral mutation in Mashi appears to represent the final diachronic stage of the process proposed by Kießling (2010: 203) since no prefixes are present on the mutating forms.

Table 6. Mashì numeral mutation patterns

	‘one’	‘two’	‘three’	‘four’	‘five’	‘six’	‘seven’	‘eight’	‘nine’	‘ten’
CITATION	<i>mū</i>	<i>fwāy</i>	<i>tāt</i>	<i>nāt</i>	<i>tsř~ři</i>	<i>sí</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>
1/2	<i>mū</i>	<i>bířwāy</i>	<i>búřtát</i>	<i>búnāt</i>	<i>búřt</i>	<i>wúsí</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>
3/4	<i>mū</i>	<i>fwāy</i>	<i>tāt</i>	<i>nāh</i>	<i>ří</i>	<i>ří</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>
7/8	<i>mū</i>	<i>bířwāy</i>	<i>bířtát</i>	<i>bířnāt</i>	<i>bířt</i>	<i>ří</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>
9/10	<i>mì</i>	<i>fyá</i>	<i>třā</i>	<i>řyřáy</i>	<i>ří</i>	<i>ří</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>
19/18a	<i>fimū</i>	<i>múřfwrāy</i>	<i>múřtát</i>	<i>múřnāt</i>	<i>múřt</i>	<i>wúsí</i>	<i>fiumádzčāŋ</i>	<i>džāŋ</i>	<i>fiumádzčífú</i>	<i>dzóřfú</i>

4.5 Summary of findings

Across the four Lower Fungom varieties showing patterns of numeral mutation, there are a number of commonalities as well as divergences. In Table 7, we summarize the patterns found in the data including: (i) the numerals where mutation is attested, (ii) the classes where mutation is attested, and (iii) whether prefixes are found or not on the mutated forms.

Table 7. Overview of mutation patterns across the four varieties

Variety	Numerals	Classes	Prefixes
Buu	‘one’, ‘two’, ‘three’	1, 3, 4, 9, 10	absent
Mufu	‘one’, two’	1, 4, 9, 10	present
Mundabli	‘one’, two’, ‘three’	all sg., 4, 10	present
Mashi	‘one’, ‘two’, ‘three’, ‘four’, ‘five’	4, 9, 10	absent

5 Conclusion

In this paper, we have presented new data on patterns of segment mutation, including both consonant mutation and vowel ablaut, in the numeral systems of four varieties of the Lower Fungom region of Cameroon. We thus contribute to the existing literature on processes of consonant mutation in languages of the Grassfields area (Kießling 2010). While there are some ways in which the data that we presented parallels previously collected data, there are some interesting patterns of variation as well, which suggest that our comparative understanding of the development of mutation and numeral systems in the Grassfields area would benefit from further targeted study of the varieties of Lower Fungom. Of particular note, in our view, are the apparent cases of analogical spread of mutation patterns within the numeral systems of Mufu (sect. 4.2) and Mundabli (sect. 4.3) which indicate that morphological change, in addition to sound change, is a potential source of mutation in numerals in this part of the world. As a final remark, while we were not able to present data on modifiers other than numerals here, we have found mutations on some additional attributive modifiers in the languages of Lower Fungom. We hope to present this study systematically in future work so that it can be compared to the data seen here for numerals.

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