

The phonology and tonology of Chamba Daka (Sámá Mūm)

INTRODUCTION

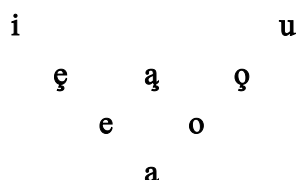
0.0 Chamba Daka, or Sámá Mūm as the speakers call it, is the language classified by Greenberg (1966) as “Daka” in subgroup 3 of the Adamawa branch of “Adamawa-Eastern”, now Adamawa-Ubangi in the Niger-Congo family. The reclassification of this language in the Benue-Congo branch of Niger-Congo has been proposed (Bennett 1983) on the basis of lexicostatistics. This, however, is a theoretically erroneous proposal. Indeed, mass comparison is conducted by inspection and its results cannot be challenged on grounds other than those of the method itself. Lexicostatistics is an entirely different method of classification which does not impinge on mass comparison. It shows that Chamba Daka is anomalous in having more roots which seem characteristic of Benue-Congo than the other Adamawa languages. This is a fact which requires explanation, in all likelihood through language contact phenomena. I have discussed the subject in considerable detail in Boyd (1997).

This paper concerns the Nnakennyaare dialect (**ñ nàk é nyāārè** ‘how have you been doing?’), spoken in the most important town in Chambaland, Ganye, Adamawa State, Nigeria. It is a kind of lingua franca, known and used by those who speak other outlying dialects for communication. The data presented here have been gathered in collaboration with Isa Sa’ad (see Boyd & Saad 2010).

This paper contains three sections in addition to this introduction: I. Canonic form and the vowel system, II. Consonant phonology and III. Tonology.

0.1 The organisation and functioning of the CN vowel system is closely linked to canonic form. The two will therefore be discussed simultaneously.

The CN vowel system is comprised of eight vowels, which may be arranged with respect to height as follows in the classical seven-vowel triangle with an eighth central vowel:



or with respect to front-/backness in a near-square system:

i u

ɛ ɐ ɔ

e a o

Long / short contrasts exist for all vowels except the front and back higher mid vowels (ɛ, ɔ) but are infrequent and strictly limited by context. CN has no phonemic nasal vowels, although vowels following nasal consonants are nasalised.

The cedilla represents simply a vowel which is one degree higher than the corresponding vowel without this diacritic. The vowels ɛ, ɔ, and ɐ¹ rarely constitute a distinctive phonological class (but cf. below in the nasal environment); in particular, they are not tense vowels in a tense/lax contrast, as there are none of the co-occurrence restrictions characteristic of such contrasts involving the existence of mutually exclusive sets of vowels. There are co-occurrence restrictions in CN but, as will be seen below, the vowel harmony they produce is of a different type.

CN is an exemplary case of the inadequacy of a phonology stated only in terms of canonic structure and contrasts in minimal pairs, without reference to grammatical categorisation. It is not enough to know that any long/short vowel contrasts which a search of the lexicon might throw up, (e.g., *sìin* ‘be full’, *sīn* ‘only’), or which might come about through affixation (e.g., *pén* ‘thing’, *pēēn* ‘go back (verbal noun)’), are *infrequent*. Only a presentation of these contrasts in terms of grammatical categories makes it possible to *explain* this distribution and, in fact, to give an understanding of the nature of the CN vowel system as a whole². We shall thus attempt to conduct this discussion with reference to three basic categories: *nominal*, *verb*, and *grammatical item*³.

¹ We have avoided the multiplication of special symbols (ɛ = ɛ, ɐ = ɐ, ɔ = ɔ) by the use of the cedilla. It will be noted, however, that the standard Nigerian practice of using a subscript for the more open of a pair of vowels has been reversed here. This decision is based on frequency in text, and allows the more frequent vowels to be written without subscript.

The exception to the Nigerian convention could have been obviated by writing ɛ as ɛ̣, but of course this would have been contrary to a widely recognised usage in the Bantu language family, and potentially confusing to linguists, if not to ordinary readers.

² See Creissels 1994:40, who says there is “a large number” of languages in which monosyllabic terms in the major lexical categories “all have a long vowel”, monosyllables with short vowels being found only outside these categories. The following discussion will show that CN is typologically related to such languages, although the situation is much more complicated than Creissels’s brief statement would suggest.

³ *Ideophones*, which, as in most African languages, form a special category in which phonological constraints applying to the main lexical categories are easily overridden, will require a separate discussion elsewhere.

0.2 Our first step will be to examine and contrast the inventories of admissible canonic structures for the uninflected base forms in each of the two major categories: nominal⁴ and verb. This discussion will include both *morphologically simple* lexemes and *derivates* obtained by addition of one or more suffixes. Reference will be made in passing to the structures obtained by affixation of the few inflectional paradigms⁵.

In the discussion of nominals, we shall refer solely to lexemes which are neither reduplicated nor clearly compounded and which apparently belong to a “native stock”, i.e., are not evident loanwords. There are no phenomena of reduplication or compounding involving verbs, and borrowed verbs are completely assimilated to CN patterns. Our discussion is therefore applicable to the entire stock.

⁴ “Nominals” will include the items which could be included in a subclass of “adjectives”, but regarding the latter category, see Boyd . The assignment of lexical items to the major categories is straightforward on the basis of both morphological and syntactic properties.

⁵ We shall not at this point deal with the consequences of the suffixation of enclitic pronominals to verbs. Vd. section 3, Tonology.

I. CANONIC FORM AND THE VOWEL SYSTEM

1. We begin with “monosyllabic” forms.

1.1 *V, VC, CV*: Neither nominals nor verbs may have any of these forms.

1.2 *CVV*: Both nominals and verbs allow this form. *VV* is always a long vowel (not a sequence of different vowels). Indeed, in this description, CN is analysed so that no sequence of different vowels appears in any lexical form⁶. This restriction may need to be relaxed in other dialects.

1.3 *CVC / CVVC*: Both nominals and verbs admit these forms, which are in fact the most frequent CN root forms. They are, however, in a complementary distribution conditioned by the final consonant and, to a certain extent, by vowel height: if C_2 is **m** and the vowel is neither **i** nor **u**, or if C_2 is **n**, the vowel must be *long*⁷. Otherwise, it is *short*⁸.

The vowels **ɛ** and **ɔ** nevertheless have a peculiarly restricted distribution: they are canonically allowed in CV(V)C lexemes, *only* when the final C is **m** or **n** wherefore they are *always* long (in fact, **ɛɛ** is attested only in CVV**n**). As the inspection of the remaining canonical forms will show, these vowels must *almost always* be phonetically long and do not allow a phonological long / short contrast⁹.

1.4 A remark is now required on the neutralisation of vowel contrasts after initial nasal stops (**m**, **n**) and semivowels (**ny**, **nw**) in the forms cited thus far. There are in fact no three-way front- or back-vowel contrasts after nasal semivowel, and they are poorly attested and

⁶ Note that vowel sequences which might appear at the juncture between final and initial vowels of successive morphemes are almost invariably avoided, either by assimilation or by insertion of an epenthetic **-r-**, as the case may be.

⁷ Instrumental studies of CN phonetics have not been conducted. Questions that any study might deal with are 1) determining whether long vowels are phonetically longer in CVV than in CVVC morphemes (as they sometimes seem, impressionistically, to be) and 2) determining whether or not the length of the vowels of CVV verbs in the morphologically complex infinitive form (marked by an **-ɛn** suffix, whose vowel assimilates to the vowel of the verb root; see below) are phonetically longer than the vowels of monomorphemic CVVN terms in any speech form.

⁸ The distribution of final consonants in the canonic structures of Fulfulde and Hausa, loanwords from which inundate everyday CN, is such that these restrictions are under little pressure for change.

⁹ There are attestations of **bɔɔbɪ** ‘blind(ness)’ as **bɔp**, particularly in **sāā-bɔp** ‘tawny eagle’, but this seems to be a consequence of compounding which results in the imposition of a more favoured canonic form (see below). Also cf. **sāā-nyɔk** ‘bat’.

doubtless under threat following nasal stop, though dialectal variation in this regard is to be expected.

Thus, in NVV where N is any nasal consonant, a three-way (i/ɛ/e) front-vowel contrast could only be obtained by comparison of the lexical items **míí** ‘child’ and **mèè** ‘swallow’ with the grammatical possessive pronominal **mèè** ‘(logophoric) speaker’s’. There is thus no contrast within any grammatical category, although speakers insist on the reality of the phonetic distinction in this case. Note however that **mèè** belongs to a paradigm also containing **wèè** ‘your’, **kèè** ‘his/her’, **bèè** ‘their’, which constitutes a strong pole for analogous attraction.

A three-way (u/ɔ/o) back-vowel contrast is, however, tenuously attested by a single set of lexical items: **nùù** ‘plait’/**nòò** ‘poison’, **nōō** ‘female (principle)’, **nóó** ‘watering place’/**nòò** ‘be fat’¹⁰.

The central vowel **ɜ** is also unattested in NVV, and appears in NV(V)C only when N is a nasal stop and C is an oral stop. **NɜN-** can nevertheless appear in longer forms, e.g., **mɜnmɜn** ‘kind of snake’, a reduplicated lexeme from an earlier **mɜtmɜt**, and **mɜnjũm** ‘kind of antelope’, perhaps compounded with **mɜt** ‘chief’s place’.

Restrictions in nasal contexts of the type described are, of course, a common areal feature.

We now turn to “disyllabic” forms with final vowel.

1.5 CV(V)CV: Both nominals and verbs allow these structures, although they are fairly rare for *nonderived* verbs, some of which are borrowings, mainly from Fulfulde and less frequently from Hausa¹¹. Other instances may be original derivatives whose base verbs are no longer in the language, but others still are of undetermined origin. There is in any case no evidence of back formation, i.e., creation of base verbs to which such verbs could stand as synchronic derivatives. This suggests that these forms are now firmly installed in the language as underived.

These forms thus constitute a context for short/long vowel contrasts according to the rules set forth below in 1.8. Such contrasts are nevertheless rare, and nominal pairs are often imperfect: the best are only tonally imperfect as **bárā** ‘space between’, **bààrá** ‘two’. Furthermore, length contrasts are impossible when **V₁** bears a contour tone¹²; verb tone patterns do not, however, allow initial contours.

1.6 CV(V)CCV

CVCCV: This is a common form for both nominals and verbs, although in many instances of the former and all of the latter, it is indicative of a derived form. **C₃** is then one of a small set of

¹⁰ The vowel of **nwúú** ‘be sharp’ may be sporadically perceived as slightly more open than that of **nwúù** ‘woman’, but it has proved impossible to establish any unequivocal **u/ɔ** contrast after the labiovelar nasal semivowel. The perceived variation is perhaps attributable to the level/modulated tone contrast in these items.

¹¹ Fulfulde and Hausa have vowel-initial lexemes. CN takes them over as such.

¹² Phonetically speaking, contour tones seem to give rise to gemination of a single medial consonant.

consonants, each of which is the mark of a specific semantic feature, although there are some formally “derived” verbs whose base-verb source is either no longer in the language or no longer identifiable as such.

CVVCCV is found only in nominals with an initial contour tone, where vowel length is noncontrastive. There is therefore no *CVCCV* / *CVVCCV* contrast, i.e. vowel length is not contrastive in V_1 position before a following consonant sequence¹³. As a result of this restriction, the long vowel of *CVVN* verbs must be shortened in derivatives formed by -*Ci* suffixation. The neutralisation of distinctive vowel length in this context provides the only opportunity to contrast eight short CN vowels. This is indeed the only case in which short **ɛ** and **ɔ** could appear in contrast with **e**, **o**: cf. **kōnkì**, frequentative of **kóón** ‘lick’ / **kōnkì**, frequentative of **kòòn** ‘get lost’¹⁴.

1.7 *CV(V)CVV* and *CVCCVV*: These forms are impossible for both nominals and verbs. They are used here simply as an orthographic device to represent a contour tone on the final vowel. This can occur only in nominals. Furthermore, any level-tone final vowel (even **ɛ** or **ɔ**) in compounds or reduplicated nominals which was long in the original root is shortened to avoid vowel-length contrasts in V_2 position.

1.8 There are important restrictions on vowel combinations in the “disyllabic” forms listed in 1.5 and 1.6.

1.8.1 In native *CV(V)CV* *nominals*, where both vowels are identical, only **Ci(i)Ci** and **Ca(a)Ca** are frequent. All other vowels are rare, sometimes represented by only one or two instances. Nevertheless,

i) if the structure is *CVCV*, the vowel may in principle be any of the eight phonemic ones, though **eCe** is not attested.

ii) In *CVVCV*, only a few instances of the low vowel **a** and a single instance of the high front vowel **i** are attested with $C_1 \neq C_2$. With $C_1 = C_2$, i.e., with segmental reduplication, **a**, **ɔ**, and **u** are attested. For all other vowels, there is no long / short contrast in this structure. In other words, there is a clear long / short vowel contrast only for **a** and **i**. The length contrast for **ɔ** and **u** is severely restricted to a reduplicative context and is nonexistent for **ɛ**, **ɔ**¹⁵, **e**, and **o**.

iii) In *CV(V)CV* when the vowels are *not* identical, V_2 is **a** or **i** in the immense majority of cases.

¹³ Phonetically speaking, a vowel under a contour tone and followed by a medial consonant sequence is slightly lengthened with respect to the same vowel under a level tone in the same context.

¹⁴ No **e/ɛ** contrast is in fact attested.

¹⁵ There is a peculiar apparent contrast **dōdō** ‘fall, failure’ < **dóó** ‘fall’ (reduplication in *CVCV*), **lòlò** ‘thumb’ < **lqq** ‘press down with the thumb’ (reduplication in *CVVCV*). It might be wise to consider the latter a compound rather than a simple derivate, particularly in the light of the perceived lengthening of the second component.

The list of nominals which are exceptions to this rule is as follows:

	$V_2 = \text{ɛ}$	$V_2 = \text{e}$	$V_2 = \text{ɔ}$
$V_1 = \text{a}$	kāāwɛ ‘cheering’ (Bata loanword)		bāābɔɔ ‘plant sp.’
	kpālɛɛ ‘rat sp.’		
	sálɛ ‘bearded barbet’		
	(sáng)/ kálɛ ‘slender-billed weaver’		
$V_1 = \text{ɛ}$			gbárɔ ‘owl’
$V_1 = \text{o}$		bōóké ‘plant sp.’	
		bóóké ‘white guinea-corn paste’	
		(kààkà)/ bōólé ‘bird sp.’ ¹⁶	
$V_1 = \text{i}$			(gà-)/ tírɔ ‘north’

Table 1

With this arrangement, when V_1 is **a**, **ɛ**, or **o**, four vowels contrast in V_2 position, but only three for all other vowels:

V_1	V_2
i	i, a, ɔ
ɛ	i, a, ɛ
e	i, a, e
a	i, a, ɛ, ɔ
ɛ	i, a, ɛ, ɔ
o	i, a, e, o
ɔ	i, a, ɔ
u	i, a, u

Table 2

It is remarkable, however, that when V_2 is **a** or **i**, only one long / short contrast has been recorded for a nonidentical V_1 in nominals with this structure. This is **lúúrì** ‘knee’, cf. **nùrí** ‘plant sp.’ Furthermore, there is no proof of **ɛ** / **e** and **ɔ** / **o** contrasts under any initial contour tone in a disyllabic nominal. We write **ɛ** and **ɔ** as V_1 in such cases, of which there is only a very small number.

1.8.2 Native CV(V)CV verbs may be base verbs, i.e., nonderived, or derived from a base verb. In all such verbs, the final vowel is **i**.

¹⁶ There is no evident reason why all vowels in this table should be long after **b** as C_1 . V_1 in **kāāwɛ** is also long in Bata. In the Mapeo dialect, some terms of **CɛCɛ** form in CN appear as **CɔCɛ**. These do not necessarily contrast with the terms cited here.

i) CVCi verbs: these are mostly base verbs but some are variants of CVt base verbs (**bát** ~ **bārì** ‘attach’) or, when ending in the causative suffix **-sì**, shortened derivatives of CVt base verbs (**dāsì** ‘cause to err’ < **dàt** ‘err’) or of CVrì verbs (**kāsì** ‘prevent’ < **kārì** ‘cut off, cut short’). V₁ may be any vowel of the set of short vowels **i, e, a, ɛ, o, u**, **a** being by far the most frequent among the base verbs.

ii) CVVCi verbs: these are mostly derivatives of CVV base verbs but some are themselves base verbs. When the latter have suffixes **-kì** or **-sì**, they could easily be respectively former pluractional or the causative derivatives of a now lost CVV verb. V₁ of base verbs may be any of the set of long vowels **ii, ɛɛ, aa, ɛɛ, oo, uu**. Again **aa** is by far the most frequent one. In these verbs, there is thus no contrast here between **ee** and **ɛɛ** or **oo** and **oo**. This contrast can only be obtained by reference to derived verbs from Cee or Coo base verbs, thus **mēēkì** ‘swallow many’ < **mēē** ‘swallow’ / **jēēkì** ‘hate many’ < **jēē** ‘hate’ and **wōōkì** ‘want many’ < **wōō** ‘want’ / **wōōkì** ‘hide many’ / **wōō** ‘hide’¹⁷.

1.8.3 In nominals with the structure *CVCCV*, V₂ is even more severely limited to **a** or **i**. V₁, on the other hand may be any of the set of short vowels **i, e, a, ɛ, o, u**. Only three exceptions exist, all with seminasal intervocalic consonant sequences: **gēēŋlē** ‘pebble’, **lāántāā** ‘pig’s hair given to a chief’, **nām̄gē** ‘cane rat’. Any or all may be earlier compounds.

Base verbs with this structure choose V₁ from the same set of short vowels and end necessarily in **-i**. Derived verbs can, in principle, contrast the full set of eight short vowels, though there is no attested instance of **ɛ**, compare **kōnkì** ‘lick many’ < **kóón** ‘lick’ and **kōnkì** ‘get lost several times’ < **kōñ** ‘get lost’.

1.9 The picture, then, is one of a set of highly favored vowel combinations with a small number of exceptions which would be available for expressive nuances, yet seem not to be exploited in this way. This phonological organisation of the native core of the lexicon appears remarkably stable in the face of the internal and external factors threatening it.

Internally, there are suffixes which, unlike the ones cited above, used in verb derivation, contradict the restrictions on vowel combinations and challenge the dominance of final **-a** and **-i**. The most important of these¹⁸ is the successive/factitive verb form which suffixes **-(r)ò**, whatever the root vowel¹⁹.

¹⁷ The only base verbs with V₁ = **ɛɛ** are **lēēsi** ‘moisten’ and **wēēsi** ‘flower (as guinea-corn)’. It happens that there are no recorded causatives of base verbs of the form Cee, hence no direct **ee** / **ɛɛ** contrasts. There is however a verb **nwōōsi** ‘age’ < **nwōō** ‘be old’ to contrast with **sōōsi** ‘itch’. Two other base verbs with V₁ = **oo** are **nōōrì** ‘train (to behave)’ and **tōōrì** ‘put (one after another)’. But **-rì** is a sporadic derivative suffix used only with a few CVC verbs.

¹⁸ See also a few nouns such as **kpāāsē** ‘hen’ (**kpāā** ‘chicken’ + **-sē** ‘feminine’).

¹⁹ A pairlike **u** / **o** contrast can thus be obtained by contrasting a factitive verb form with one of the extremely rare nominals with V₁ = V₂ = **u**: **dúkò** ‘should finish’/ **sūkúu** ‘frightening (thing)’. Otherwise, this contrast can only be obtained from two morphologically complex terms, e.g., assuming (as is done here) that complement pronouns are

Externally, loanwords, most from Fulfulde and Hausa, will often contradict the organizing principles of vowel structure. Thus, Fulfulde has a clear *o* / *u* contrast for final vowels which is generally maintained in loanwords, cf. **jámò** ‘health’ (Ffde *jamo* ‘healthy person’), **lāāmù** ‘chief’ (Ffde *laamu* ‘power, throne’). This is even more true of Hausa where final high vowels are much more frequent, cf. **kpáánò**²⁰ ‘roofing sheet’ (Hausa *kwáanò*), **làmbú** ‘irrigated farm’ (Hausa *làmbúu*). As we have seen in 1.9.1, final **-u** is possible in CN only when the preceding vowel is also **u**. These loanwords therefore introduce a general two-height contrast for back vowels, quite different from the pre-existing situation where contrast was only possible harmonically (by sequence of identical vowels). One does however observe a certain tendency to lower final high back vowels phonetically, and this phenomenon may be said to be harmonizing if the preceding vowel is low. Some Fulfulde loanwords have undergone an assimilatory process whereby the final **u** / **o** contrast is neutralized. This is particularly visible after **r**, cf. **jāwrò** ‘ward chief’ (Fulfulde *jawro*), **wāwrò** ‘well’ (Ffde *wawru*). There is also a tendency to transform *ee*, *oo* in Fulfulde or Hausa roots to **ɛɛ**, **oo**, especially in harmonic situations, cf. **gōōrò** ‘kola nut’ (Ffde *gooro*, Hausa *góořò*).

1.10 Our next step must be to examine disyllabic forms with final consonant.

1.10.1 *CV(V)CVC* : This is a common nominal form, obtained in many instances by a process of derivation. The quality of V_2 is generally determined by the final consonant, itself chosen from a very limited set. Preferred sequences are:

i) **u** before **m**, **p**²¹. Exceptions are very rare: **kànyĩm** ‘dung beetle; uremia’ is generated by the general prohibition of **nyu**, but cf. **dùtĩm** ‘seven’ and the compound **nōō-gílĩm** ‘plant sp.’ (**nōō** ‘productive’, hence ‘leafy’). **Gèèrám** ‘eyebrow’ is also attested and a certain tendency towards harmonization (**u** > **a**) can be observed after $V_1 = a$.

In these lexemes, V_1 can be any short vowel and, in principle, **ɛɛ** or **oo**, though only the deviant **gèèrám** ‘eyebrow’ actually illustrates this possibility. The appearance of other long vowels depends on derivation as in **yáásúm** ‘ascent’ < **yāāsì** ‘bring up’ < **yáá** ‘climb’, itself practically the only relevant example²².

ii) **e** before **n**. Exceptions are nonexistent in nominals. They appear only in items such as harmonic ideophones (**dántàrán-dántàrán** expressing hypotrophy), **dùtĩm** ‘six’ and the adverb **sààsĩn** ‘right away, particularly’.

suffixes, **dúkò** ‘should finish’/**dūukù** ‘forge for him’.

²⁰ The height of the final vowel in both Fulfulde and Hausa loanwords varies from **o** to **o** with no discernable contrast. A certain expressive component may, however, call up a lower realization, cf. **keefeero** ‘infidel’ (Ffde *keefeero*). This subject could be developed further by close scrutiny of terms which conflict strongly with the CN system.

²¹ Final **-up** is far rarer than final **-um**.

²² Note **léèrũm** ‘moss, mildew’, probably from a no longer extant **lèrĩ** ‘be damp, moldy’.

The large majority of lexemes with this extremely frequent structure are derivatives. Length contrasts are therefore well represented in V_1 position, cf. **dārēēn** ‘upper’ (< **dāt** ‘up’) / **dààréēn** ‘bare’ (**dàà** ‘fall off’) and **nōōrēn** ‘fat’ (actually a form here called the “extended infinitive” < **nòò** ‘be fat’) / **nórēn** ‘witch’ (apparently underived).

iii) $V_1 = V_2$ before **ŋ**. There is a rather frequent set of exceptions of the form **CiCaŋ**, several of which designate cultural objects (**pìlàn** ‘kind of basket’, **gísàn** ‘kind of fishnet’). All other exceptions are among ideophones²³.

This category contains no derivatives and V is chosen from the set of short vowels **i, e, a, ɔ, u** only.

The only one of these structures which can be used for verbs is ii: **-èn** is indeed the resultative suffix applied to **CVV**, **CV(V)C** and **CV(V)Ci** verbs, hence almost all verbs of this form are derivatives. Those which are not have become detached from a lost base verb. Length contrasts in V_1 position are again well represented.

1.10.2 CVCCVC: The rules governing nominals of this form are not appreciably different from those described for **CV(V)CVC** except that only short vowels from the set **i, e, a, ɔ, u** are allowed as V_1 . Again, numerous lexemes with final **-um** or **-en** are nominal derivatives of verbs, while none with final **ŋ** are.

i) **-um, -up**²⁴: Exceptions universally have final **-əm**. V_1 may be harmonic (**pànsáəm** ‘plant sp.’) or not (**sàksáəm** ‘maize plant’ sp.²⁵).

ii) **-en**: Exceptions may involve lengthening of V_2 as in **CVVN**, cf. **sàrsààn** ‘Abyssinian roller’ and **vìrvìin** ‘flying beetle sp.’²⁶, both of which are in fact reduplicated nouns, felt to represent a sound associated with the animal. In the case of **tùtsîn** ‘comb wasp’ V_2 may be induced by the preceding consonant sequence.

This is the only one of these three structures allowed for verbs. Such verbs are invariably derived either from **CVCCV** bases by adding the resultative suffix **-èn**, or from **CV(V)C** or **CVCi** bases by addition of derivative suffixes of the form **-Cèn** (replacing the final vowel in **CVCi**).

iii) **-ŋ** with harmonic vowels: these lexemes are highly ideophonic and the vowel is often **ɔ**. Even the rare exception **kárbàng** ‘pin-tailed whydah’ has **ɔ** as V_1 .

1.10.3 CVVCCVC and CV(V)C(C)VVC forms (i.e., long vowels in “closed syllables” of disyllabic words) are nonexistent (although these forms may appear orthographically in the presence of contour tones).

²³ Note the trisyllable **bōkōlōŋ** ‘kind of trap’, realized [bōkūlōŋ] with phonetic shortening of V_2 .

²⁴ There is only one attested example: **mèŋlúp** ‘ebony tree sp.’

²⁵ Of 17 examples with neither compounding nor reduplication, 13 are plant or animal names and 4 are derived nominals.

²⁶ Names of plants and animals are again prevalent in terms of this structure.

1.11 A brief discussion of forms longer than the ones cited thus far will suffice to conclude this inventory.

1.11.1 Most longer *nominal* forms are “trisyllabic”. Some of these may be historical derivatives (obtained by processes which are no longer productive), compounds, or loans; but if so, these facts cannot be determined by simple inspection²⁷. Restrictions identical to those which apply to the shorter forms already cited govern final vowels (canonically **a** or **i**) and final consonants (canonically a nasal).

i) CVCVCV (**kpèkèsí** ‘blacksmith’s scrape’, **pépélā** ‘swift, martin’):

Vowel length has been noted in V_1 and V_2 positions (**tàākūlà** ‘tree sp.’, **sùgbāālí** ‘shin’ and even **kòòsìrì** ‘?’²⁸), although there are no contrasting pairs. Both sporadic length and $V_1 \neq V_2$ are features suggestive of historical compounding as a source.

There are also rare cases of CVCVCV with three identical vowels (e.g., **sòròrò** in **sú/ú** **sòròrò** ‘dusk, time from 5:30 to 6 p.m.’, with **sūū** ‘sun, day’). These are expressive and would certainly allow only a six-way short-vowel contrast, most possibilities being unattested.

ii) CVCVCVC (**bìsálāṅ** ‘tasteless, insipid’). Nominals of this kind are extremely rare with the exception of derivatives from verbs marked by final **-en**. There are no notable exceptions to the structures enumerated in 1.10.1.

1.11.2 All other trisyllabic forms have a single medial consonant sequence. There is no attestation of a long vowel in any position of these lexemes. In the case of nouns, we observe:

i) CVCCVCV (**gálkúmà** ‘kind of thorn plant’, **lāṅkpāāsí** ‘*Bombax* sp.’). This is the most frequently attested of the trisyllabic forms, and includes noncanonic instances of final **ɛ**, e.g., **sáṅ/kálɛ** ‘slender-billed weaver’ and **gbárkásɛ** ‘kind of spear’ (Mumuye loan?). Lexemes with homorganic nasal-stop sequences (e.g., **bàntūrà** ‘rope plant’, **dùṅkpālì** ‘hippopotamus’ and ‘weaver’ above) are frequent. Furthermore, extended plurals of irregular adjectives (formed by suffixing **-ena**, cf. **vírki**, pl. **vírkēnā**) have this structure.

ii) CVCVCCV is rarer (**kólōṅsí** ‘swelling of groin’, **bárúmsà** ‘sissy’). Nasal-stop sequences are predominant. A single instance of non-canonic final **-ɔ**, **sàlàmbó** ‘headscarf’, is doubtless a loanword. The noncanonic consonant sequences in **vírùmvíí** ~ **bírùmbíí** ‘ground hornbill’ suggest historical compounding.

iii) CVCCVCVC not derived from verbs is attested but seems always to have an expressive or ideophonic character (**tāṅkpālāṅ** ‘kind of flute’).

iv) CVCVCCVC is not attested.

1.11.3 With regard to verbs, the progressive/factitive form of CVC(C)**ì** verbs is CVC(C)**írò**, while CVC(C)**èn** becomes CVC(C)**énò**, yielding CVC(C)VCV structures. Likewise, the verbal noun of CVC(C)**èn** verbs will have the form CVC(C)**élnēn**, hence CVC(C)VCVC.

²⁷ Some loans might be discovered if larger vocabularies of Chamba Leko and Mumuye were available for technical domains such as botany and hunting.

²⁸ In a proverbial expression **kòòsìrì kūūn** ‘s.th. lethal’ (**kūūn** ‘matriclan’).

1.11.4 “Quadrisyllabic” nominals are equally rare and suggest either compounding from unknown elements or expressivity, cf. **nyàksìkùní** ‘chameleon’ and **tàngàlānsì** ‘hornbill’. The rule of a single consonant sequence is maintained. Quadrisyllabic verbs do not exist.

1.12 In the nominal and verb categories, the restrictions imposed on the sixteen possible contrasting elements in a system of eight vowels with a binary length feature may thus be summarised as follows:

1) With regard to canonic form in general: canonic forms of monomorphemic lexemes are short in the great majority, with one or two vowels and, in nouns, no more than one two-consonant sequence. Monomorphemic verbs in particular cannot have a canonic form longer than CVCV; the only “exceptions” to this rule are those CVCCV verbs which have derivate form but no base verb in the language.

2) With regard to length contrasts:

a) two vowels, **ɛ** and **ɔ** are *intrinsically long* and do not allow a length contrast. In some contexts (when followed by a homosyllabic nonnasal consonant or a consonant sequence, in final position in structures other than CVV and as V_1 in CVCV with $V_1 = V_2$), they nevertheless have an obligatory *short realisation*. As a result, there is allomorphic variation when morphemes containing them are subjected to inflectional or derivational processes which create a context in which vowel length is prohibited.

b) The other six vowels have *no intrinsic length feature* and therefore display length contrasts where canonic form allows them (for the most part, as V_1 in open syllables of polysyllabic lexemes)²⁹.

c) In monosyllabic lexemes, eight vowel heights may contrast but not as both long and short.

d) Length contrasts are obtainable in a specific canonic position in polysyllabic lexemes for only six of the eight vowels (i. e., excluding **ɛ** and **ɔ**), although in fact only **a/aa** is frequent, and often involves pairs, one or both of whose members are polymorphemic, e.g., **dākì** ‘clean’/ **dāākì**, frequentative of **dāá** ‘turn’.

e) In monomorphemic lexemes, all eight vowel qualities may contrast as short vowels, but only *harmonically* (i.e., in polysyllabic lexemes with identical vowels). In polymorphemic lexemes, however, the eight vowel qualities may contrast without harmonisation.

Differently stated,

²⁹ Preference for long mid vowels is perhaps more characteristic of Chadic languages (a similar feature exists in Hausa, but in a three-height system), but there is thus far no evidence of the presence of this feature in CN being a result of contact phenomena. Indeed, Boyd (2002) discusses questions of vowel length in Bata, the Chadic language with which CN has had the closest historical contact, and finds that the pertinent feature is following consonant rather than vowel height. Furthermore, there is very little historical evidence of lexical borrowing from Chadic outside modern Hausa (see Boyd 1994).

a') The full set of long vowels contrasts in nominals and verbs only before \emptyset or final nasal in monosyllabic lexemes and before CV in polysyllabic lexemes (i.e., not before final oral C in monosyllabic lexemes or before CC in polysyllabic ones). In consequence, length contrasts are essentially restricted to V_1 position (excluding reduplication and minor exceptions as cited above).

b') Individual contrasts for the full set of short vowels can be obtained only in V_1 position before CC. Strictly speaking, there are no minimal pairs before CV because V_2 cannot be held invariant, i.e., any contrasts involving ɛ and ɔ in CVCV are harmonic.

c') The full set of long/short contrasts for the eight qualities is never obtainable in a single context.

d') Despite the latter limitation, it is clear that, in phonological terms, CN incontrovertibly has a wide-reaching long/short vowel contrast in this component of its lexicon. This contrast nevertheless has a major demarcative or suprasegmental role insofar as it is intimately associated with, and almost invariably conveys information about, both word and morpheme structure.

3) With regard to final vowels:

a) Final vowels which are of a different quality from the preceding vowel in monomorphemic polysyllabic lexemes must be short i or a , but mid-height vowels, generally noted ɛ and ɔ , appear sporadically in native terms and often in loanwords; ɔ is also found final in polymorphemic polysyllabic lexemes. Exceptions to these conditions (including trisyllabic lexemes with identical vowels) may produce a foreign or ideophonic impression or simply represent “coloratura” in discourse³⁰.

b) The quality of a vowel other than V_1 , followed by a *final* consonant, is canonically determined by the nature of this consonant, although exceptions of an expressive nature exist.

c) Vowels and consonant-vowel sequences in final position thus also have a demarcative role.

2. The *grammatical morphemes* of CN belong to closed inventories, some consisting of a single morpheme. Some of these inventories are such that the morphemes they contain cannot be distinguished phonologically from the components of the open inventories of nominals and verbs. Morphemes which function syntactically as autonomous nominal constituents of an utterance may also resemble the nominal inventory morphologically insofar as they have an “extended form” marked by final $-\text{f}^{31}$ (see below, Nominal morphology). This is the case with:

Class A)

³⁰ It must be stressed that exceptions are always possible. Indeed, in CN as in other African languages (see Boyd 1997), constraints on vowel combinations of the type described here impose no *articulatory* constraints, i.e., the speaker has no difficulty pronouncing words with combinations deviating from the predominant ones. Indeed, ideophones provide instances of many of the structures banned in the nominal and verb categories.

³¹ This form is cited here in parentheses whenever it is attested. Further elicitation is required to determine which unattested extended forms actually exist.

1) the independent person markers or pronouns:

	singular	plural
first person	nòk(í)	wóó(rí)
second person	wīī(rī) ³²	vóōn (vóōní ~ vó/óní) ~ vōōn (vōōní)
third person animate; logophoric nonspeaker	góōn (góōní ~ gó/óní)	bóōn (bóōní ~ bó/óní)
third person inanimate		géēn (géēní ~ gé/éní)
logophoric speaker	mínēn	mínēn būū

Table 3

2) the *interrogative lexemes*: **máà(rí)** ‘who?’, **nyáā (nyá!áí)** ‘what?; which?; why?’; **nyāā(rí)** ‘how?’; **yìréēn** ‘when?’, **máān (má!áí)** ‘which?’.

Other inventories may display certain features which distinguish them phonologically from the open inventories but yet have an extended form. This class includes both inventories which function syntactically as autonomous nominals and others which function as autonomous circumstantial constituents:

Class B)

3) the *noun substitute* **pén(í)** ‘thing’;

4) the *demonstratives* **déēn(í)**, **(r)àán(í)** ³³, and **dáān (dál!áí)** ³⁴, the choice of which is made in terms of discourse information structure.

5) the *quantifier* **dōn (dōón(í))** ‘other’;

6) most *governors*, here called “heads”, which express spatial or temporal location either independently or by governing nominals (e.g., **tīī(rī)** ‘downwards (to), at; east(wards)’, **bīīn(í)** ‘in front (of), later’);

7) the *deictic adverbs*, for example **gùt (gùrí)** ‘there, at a distance’, **bàà** ‘over there, at some invisible place’, **móōn** ‘formerly, in times past’, **kàán(í)** and **gīīn (gí!íí)** or **gīīn** ‘thus’.

and among morphemes with circumstantial function:

Members of class B with final **-n** will diverge phonologically from the nominal and verb inventories by a tendency to shorten their vowels. This is particularly true of front vowels, cf. the heads **nyēm** ‘at (the) home (of)’ and **bēn** ‘on (the ground), at (the origin)’ and the deictic **nyēm**

³² Exceptionally, mid-tone CVV grammatical morphemes may have a mid-, rather than a high-tone extension.

³³ Of the three, this one alone can be an autonomous component of an utterance. As in all vowel-initial morphemes, which can only be grammatical, initial **r-** appears when the preceding term ends in a vowel. This morpheme is used to close relative clauses in the shortened form **(r)àn**.

³⁴ Perhaps < **déēn + àán** . In fact, with the exception of heads, all terms ending in **-n** in class A either demonstrably or presumably have an etymology involving final **-àán**.

‘yesterday, on the preceding day’³⁵. In the same way among the demonstratives, **gí!ní** is usually **gí!ní** and **dééní** is realized **dé!ní**. The temporal deictic **nyíín** ‘now, at the indicated time’ is furthermore invariably realised not only with short vowel but at times with a single prepalatal obstruction, i.e., close to [ɲ́].

Some grammatical morphemes which are autonomous neither as nominals nor as circumstantials do not have an extended form, even though they can appear in final position. This is the case with:

Class C)

7) the *comitative governor* **wàà** ‘with’;

8) the *alternative verb marker* **dèn** ‘rather, instead’;

9) the *restrictive predicate marker* **sín** ‘only, just’³⁶.

Others cannot appear in final position, yet have CVV structure and are thus phonologically indistinguishable from the open inventories. These include:

Class D)

10) the topicalising particles **máá** ‘even (if)’ and **bóó** ‘as for’ borrowed from Fulfulde, which can only appear before pause.

11) The *comparative governor* **kàà** ‘as’ which cannot be an independent utterance component; it must, on the contrary, govern another element. In particular, in order to take the deictic meaning ‘thus’, it must govern the demonstrative **àán** as **kàà ràán**. Clearly, **kàán** ‘thus’, already cited, has the same etymology.

Still others which appear in final position infringe the *prohibition on CV forms* which characterizes the open inventories. This happens in a variety of ways. Some have a long vowel before pause, but a short vowel elsewhere. These include:

Class E)

12) the *plural marker* for nominals, **bū(ū)**;

13) the *perdurative marker* **tē(ē)**.

14) The set of *possessive/benefactive markers*³⁷ may be added to this set on the basis of the first person singular form, although the almost all members of this paradigm have intrinsically long vowels (**ēē** or **ōō**) which remain such in utterance-final position:

³⁵ But note **dōn** ‘other’ where a back vowel has undergone reduction, both in length and in tone.

³⁶ Other lexemes of noncanonic nominal/verbal form may be included in this category, namely, the deictics **tàksín** ‘tomorrow, on the next day’ and **sààsín** ‘long ago; immediately thereafter’, which may be supposed to have a similar etymology with **sín** ‘just’ as second component. The former might derive historically from the same root as **táká** ‘night’, while **sàà** is still used as a variant of the latter.

³⁷ In possessive use, these indices modify nouns but they are part of the valency of verbs as benefactives (see Boyd 2010b). In benefactive use they have an alternate form suffixing **-ñ**. With this suffix or with **-ñ** in the case of the first person singular (> **mèn**), the paradigm may also be used, either alone or following the corresponding member of the subject paradigm, as subject of a nominal predication.

	singular	plural
first person	mè(è)	wòò
second person	wẹẹ	bẹẹ (= vẹẹ)
third person;	kẹẹ ³⁸	bẹẹ (= vẹẹ)
logophoric nonspeaker		
logophoric speaker	mẹẹ	bẹẹ (= vẹẹ)

Table 4

A peculiar and ambivalent case is:

Class F)

15) the *verifiable evidential marker* **bé/é** which appears with short vowel as **bé** followed by downstep in nonfinal position but as **béen** in final position. This marker also has an extended form yielding **bééní** ~ **bé/éní** as occurs in class A, rather than showing the reduction which characterizes the morphemes in class B (see 29 below).

Some grammatical morphemes never have long vowels, even in utterance-final position. These include

Class G)

16) the set of *oblique third-person markers*:

	singular	plural
third person animate	gú	vú
third person inanimate	gí	

Table 5

17) the *injunctive verb marker* **ká** (~ **gá**)

18) the *confirmative negative marker* **sá** ‘not so?’

19) the marker **bè**, postposed to nominals with a “relational” sense (‘having to do with’).

We may include here the CV morphemes which can *never* occur in utterance- or proposition-final position:

20) the marker **bè**, preposed to verbal nouns with a “prospective” aspectual sense (‘do as a general rule’);

21) the *auxiliary verbs* **bà** ‘consecutive’ (< **bàk** ‘follow’) and **mà** ~ **à** ‘future’ (< **màà** ‘go’).

³⁸ If the possessor is inanimate, a suffix **-í** is added to the third person singular: **kéen** ‘its’, as in the examples **sān keen** ‘its remedy, its solution (to the problem)’ and **pá/sí keen** ‘new ones (leaves)’.

Finally, there is a set of items which are always or often utterance- or proposition-final. Their canonic form is CV and they are marked by a final glottal stop when followed by pause. These are:

- 22) the *negative particles* **só**³⁹ and **bé**;
- 23) the *subordinating particle* **gà**;
- 24) the *perfective particle* **gò**;
- 25) the *ordering predicate marker* **sè** ‘first, beforehand’;
- 26) the *restrictive predicate marker* **jé** ‘simply, only, gratuitously’⁴⁰;
- 27) the *quantifier* **pè** ‘also’.

Still another set of grammatical morphemes does not respect the *prohibition on V(C) forms*. These are preceded by epenthetic **r-** when the preceding term ends with a vowel (some regular exceptions are cited below, although there are also some apparently unconditioned exceptions as well)⁴¹. These include:

Class H)

- 27) the *positional markers* **(r)ĩ** and **(r)à ~ (r)è**;

- 28) the *comitative/instrumental marker* **(r)ĩ**;

29) the *unverifiable evidential marker* **(r)é/é** has a short vowel followed by downstep in medial position but becomes **éēn**⁴² finally. Its extended form continues to show a short vowel, **éñĩ ~ é/ñĩ** (see 15 above).

Finally, CN has truly affixal markers which also have either V, CV or VC form, though some pronominals and other affixes are syllabic nasals. These include:

Class H)

- 30) the *subject person indices*⁴³:

³⁹ The *negative interrogative* markers **sáà**, **sée** (perhaps diachronically analysable as contractions of the negative marker **só** + **è** ‘interrogative’) behave as the members of class C above, and are without glottal stop.

⁴⁰ This term has become quite frequent in nonfinal position as an emphatic introductory particle for ideophones. In this use, it alternates with the form **jí**.

⁴¹ Any final unvoiced stop in a term preceding these morphemes will become voiced (see the correspondences in the remarks on the consonant system, below).

⁴² As with the morphemes in class B, the vowel remains short, cf. **é/ñĩ** with the assertive marker **-ĩ** suffixed

⁴³ The subject indices are in fact *animate indices*, i.e., any conjugated verb with an animate subject must have a subject index whether or not it has another independent (nominal or pronominal) subject. The only exceptions to this rule are the simple imperative form (see below), which requires no subject and, in direct speech, the third person singular, which is not represented by an index. In the examples appearing below, the personal subject indices are represented orthographically separate from the following verbs, although they can perfectly well be considered prefixes. An orthographic contrast is thereby avoided between the sequences **ny**, **nw**, where the nasal bears a tone and the semivowel is the initial consonant of another morpheme, and the toneless nasal semivowels, **ỹ**, **w̃**, represented as **ny** and **nw**, respectively, with no tone.

	singular	plural
first person	m̃ ⁴⁴	á
second person imperative	à	ì
second person	ñ ~ ā	í (~ í) ⁴⁵
third person animate, direct speech	ø	
logophoric speaker	ín	
logophoric nonspeaker	kù	

Table 6

31) the *factive marker* **kù**, which precedes the verb and its subject index.

CN has one set of enclitics:

Class I)

32) the *object person indices*⁴⁶:

	singular	plural
first person	m̃ ⁴⁷	á
second person	à	vú
third person animate;	kù	bú
logophoric nonspeaker		
logophoric speaker	ín	

Table 7

It will be noted that, with the exception of the logophoric, all singular object indices have low tone, while all plural object indices have high tone. The object indices impose mid tone on preceding CVV or CV(V)C verb roots, thus neutralizing any lexical tone contrast, and cause shortening of the vowel in a CVVC verb by creating a CVCC- context. They are therefore considered enclitic.

⁴⁴ All nasal subject markers, first, second and logophoric singular, behave as archiphonemic nasals assimilating to the initial verb root consonant. In this table, we reconstruct the labial nasal subject forms from the object forms (see just below). This cannot be done for the second person singular which is therefore truly archiphonemic.

⁴⁵ This variant, also an archiphonemic nasal, is frequent in noninitial position. Exceptionally, no epenthetic **-r-** is generated between the plural marker **bū** of a preceding nominal subject and the third person plural index, resulting in phonetic [būú] or [būún]. In the same way **bū** + the demonstrative **án** gives **bàán**.

⁴⁶ These indices, like the subject indices, are *animate*. Inanimate objects are not marked.

⁴⁷ Like the logophoric singular index below, this index assimilates any preceding labial C and > **-ùm** (logophoric **-úm**) following a C with a nonlabial point of articulation.

All other grammatical morphemes are suffixes. These include:

Class J)

33) the semantically indistinguishable *interrogative markers*, (r)á and (r)è, and

34) the *assertive marker*, (r)ì, all of which, like the final vowel of the extended form, must be utterance-final.

Verb conjugation and derivation are based on suffixation and tone sandhi. This subject will not be addressed here.

3. The above is a typology of the canonic forms and, to some extent, a syntactic classification of grammatical morphemes. It is not, however, an exhaustive list of these morphemes, which may be found in Boyd and Sa'ad (2010a) with examples of use.

It should nevertheless be clear from these indications that relative “weight” of canonic forms is used in CN in a way similar to stress in some toneless languages: the “heavier” forms such as CVCCV and CVVN are reserved for the major lexical categories and items assimilated thereto and hence signal independent terms; while the “lightest” forms, CV, N, V, are restricted to grammatical modifiers or function words and signal dependency with respect to some other term. Consequently, the grammaticalisation of any term often implies reducing the weight of its canonic form, e.g., CVC > CV.

The possibility of “minimal pairs”, referred to in 0.1, is thus dependent on the fact that, within different grammatical classes, the sets of canonic forms, vowel contrasts, and applicable phonological rules differ. It would therefore seem that, even from a classical structuralist approach, the validity of pairs chosen without regard to grammatical category for proving the phonological nature of vowel length is questionable.

II. CONSONANT PHONOLOGY

1.1 The morpheme-initial consonant system of CN is as in Table 1:

unvoiced fortis ⁴⁸	p	f	t	s	k	kp
voiced fortis	b	v	d	j	g	gb
lenis oral	v ⁴⁹		l	y		w
lenis nasal	m		n	ɲ		ɰ

Table 8

In this system, **ɲ** and **ɰ** are nasal continuants. They contrast phonemically with **y** and **w**, respectively, only when the (monomorphemic) term in which they appear contains no other nasal consonant. Otherwise **ɲ**, **ɰ** appear in initial position whenever the next consonant is nasal⁵⁰.

It will be noted that the unvoiced apical fricative has a voiced counterpart whose most frequent realisation is affricated⁵¹. Other consonants (such as implosives) may appear in initial position in loanwords, but as these are assimilated, so the foreign initial consonants are reduced to their corresponding element in the native system (thus, the implosives *ɓ*, *ɗ*, for example, become voiced plosives, **b**, **d**, while Hausa *sh*, *s*, *c*, *ts* all merge into CN **s**).

1.2 CN resembles many of the “North Central Niger-Congo” languages (Bennett and Sterk 1977) in having sharply reduced inventories of intervocalic and final consonants. The intervocalic system is in Table 9:

⁴⁸ The fortis nature of both voiced and unvoiced plosives is realised as aspiration, except in the case of the labiovelars, which are (impressionistically) slightly implosive.

⁴⁹ The labial flap which is widespread in Central Africa.

⁵⁰ There is a single attested exception to this rule: the proper name of the chiefly **Yáám** patriclan. This term is not, however, “foreign-sounding”, since *polymorphemic* terms do not give rise to the same neutralisation, i.e., the initial **w** in **wúú** ‘die’ and the initial **y** in **yáá** ‘climb’ remain oral, even in the infinitives (**wúún**, **yáán**), which suffix **-(ē)n**.

⁵¹ Creissels (1989:57) cites languages with three consonant series: voiced obstruants (including **j**), unvoiced obstruants, and unvoiced fricatives (including **s**). CN is clearly not a language of this type; the possibility of Fulfulde influence may be considered. Note that CN **j** has a [z] and [dz] allophones.

fortis	b	r	s	k	(gb)
lenis	(w)	l	(y)		
nasal	m		(ỹ)	ŋ	

Table 9

Intervocalic **l** may be a recent innovation attributable to borrowing (in which case a geminate in the source language may be conserved), to the reduction of apical + **l** sequences (see below), or to both.

Note that the labial and apical fortis consonants, like the (marginal) labiovelar, have voiced representatives, while the palatal and velar terms are unvoiced. The velar is often backed and fricative (phonetic [χ]).

None of the semivowels is well attested. For the native lexicon, the **y/ỹ** contrast can at best rest on **kòyō** ‘toad’, **kàỹá** (in **kéém kàỹá** ‘kind of monkey’), although this contrast is reinforced by compounding and particularly by borrowings from Fulfulde.

An oral/nasal labial semivowel contrast might be had from reduplication, cf. **wààwà** ‘small intestine’, **wàáwáá** ‘bird sp.’

Intervocalic **w**, **y**, unlike the semivowels in initial position, rarely follow or precede “homorganic” vowels (i.e., back or front vowels, respectively). Where this occurs, the structural presence of an intervocalic consonant is postulated to exclude vowel sequences from the canonic forms, cf. the circumcision names used in the town of Pola, **Kòwá** and **Píyá** which, given the absence of contrasts, could just as well be written **Kùá** (or **Kòá**) and **Píá**, if structural constraints were ignored.

1.3 The word-final system is even smaller:

fortis	p	t	(s)	k
lenis	w	(r)		y
nasal	m	n		ŋ

Table 10

The semivowels in the lenis series can be found in nominals. Ideophones alone show the full lenis set, including **r** which is sometimes trilled, as well as **s**. Treating the semivowels as final consonants again makes it possible to avoid vowel sequences requiring a canonic structure CV_1V_2 which would contrast with CVV and CVC . Moreover, as we have just seen, these consonants already occur in intervocalic position and therefore appear in all **C** positions with the exception of

consonant sequences⁵². Final semivowels nevertheless do not appear after back vowels with a single exception, the exclamatory **sòóy** ‘serves you right!’⁵³

1.4 CN allows intervocalic sequences of two consonants. There is thus a *syllable*-final system which differs from the word-final system in adding **l**, but includes the semivowels **w** and **y** only when imported via loanwords. Furthermore, in syllable-final position, **t** is usually realised as **r** unless followed by **s** (see below, regarding consonant sequences)⁵⁴.

In the case of verbs, consonant sequences are canonically the result of adding a -CV suffix to a CV(V)C base. In the case of nominals, they may arise from composition or reduplication, but if they do not, they are synchronically parts of the nominal root, although diachronically the second consonant in the sequence may at times represent a vestige of a suffix in an earlier noun classification system⁵⁵.

1.5 In view of these facts, it is clearly difficult in principle to distinguish purely phonological restrictions on consonant sequences (or on the inventory of *post-consonantal* syllable-initial consonants) from gaps attributable to the nonexistence of synchronic or diachronic morphological forms. The problem is further complicated by the fact that the restrictions which seem to apply in the nominal and verb components are relaxed in both the ideophonic component and the mass of lexical items borrowed from Hausa and Fulfulde, thereby creating doubt about their scope and/or degree of obligatoriness.

Let us therefore attempt to define a basic system of restrictions applying to nominal and verb lexemes, whether bases or derivatives, and discuss the extent to which of these rules seem under threat.

1.6 **RULE 1:** Gemminate sequences are practically unattested. There is a single instance of **mm**, formed by suffixing the resultative **-mèn** to a root ending in a bilabial nasal (**sààm** ‘find, get’ > rs. **sāmmèn** ‘be found’)⁵⁶. This form is clearly residual. The suffix paradigm is adapted to avoid

⁵² The decision to allow final semivocalic consonants is made on structural grounds. Vocalic behavior is nevertheless attested. Thus, **yàáy** ‘yodel’ has been observed in the form [yàìrì] with assertive suffix rather than the homophonic **yàáyì**. Medial **-r** results from a preceding vowel, thus either **yáyì** (which would require the medial semivowel to appear before a homorganic vowel) or **yáì**.

⁵³ Cf. the ideophone **sóy** < Fulfulde *cóy* expressing the redness of ripe fruit.

⁵⁴ Note, however, **sàrsààn** ‘Abyssinian roller’, an ideophonic nominal representing the bird’s cry, which, if accepted on a footing with non-ideophonic terms, could be opposed to **větsàān** (< **větsì** + **à** + **-ēn**) ‘to divorce you’.

⁵⁵ A functioning system of singular/plural suffix alternation currently subsists only in five adjectival terms (see below, Nominal morphology).

⁵⁶ This rule applies at the point of contact between roots and suffixes, but excludes sequences involving a verb root followed by an enclitic object pronoun, which may give rise to final **mm** (root-final labial plus pronominal **-m** ‘logophoric singular’ or **-m** ‘first person singular’), and intervocalic **-kk-** (root-final **k** + pronominal **-kù** ‘third

such gemination and most CV**m** verbs have a resultative in **-èn**. There is, however, phonetic gemination of a single intervocalic consonant following a vowel bearing a contour tone; and final trilled **r** (written **rr**) is found in ideophones.

Geminate consonants are, of course, frequent in Fulfulde: geminated nasals, laterals, and voiced and unvoiced stops are all recognized and reproduced in attested borrowings, many of which seem fairly well integrated into CN. Terms with **-ll-** are particularly frequent and there is a single term **wàllí** ‘plant sp.’ (cf. **wāli** ‘mix’ for contrast) for which a Fulfulde source cannot be found. These geminates are, however, generally internal to a polysyllabic root, while the restriction in CN applies essentially to prevent the formation of double consonants at the juncture between roots and suffixes. Consequently, the restriction as such is not actually threatened. The same conclusion can be drawn with respect to the occasional use of geminates in the ideophonic component of CN.

1.7 RULE 2: **-s-** may not precede any consonant⁵⁷.

RULE 3: **-n-** may not follow any consonant⁵⁸.

RULE 4:

a) Any of the set of nonmarginal consonants in Table 2 may be followed by **k** or **s**:

b) **-l-** may be followed *only* by these two consonants.

-pk-	-mk-	-rk-	-lk-	-nk-	*-sk- (Rule 2)	*-kk- (Rule 1)	-ŋk-
-ps-	-ms-	-ts-	-ls-	-ns-	*-ss- (Rule 1)	-ks-	-ŋs-
*-lp-	*-lm-	*-lr-	-ll- (Rule 1)	*-ln- (Rule 3)	-ls-	-lk-	*-lŋ-

Table 11

Indeed, **-kì** and **-sì** are highly productive verb derivational suffixes (respectively pluractional and causative), but the same **-Ck-** and **-Cs-** sequences can also be found in nominals.

As indicated, the realisation of **-t-** is [t] before **-s-**, but [r] before **-k-**. The resulting sequences, **-ts-** and **-rk-**, tend, however, to reduce to **-s-** and **-k-**, respectively. In most cases, the sequences are indicative of careful speech, although **-ts-** may now also lend itself to use in doublets in contrast with **-s-**. This situation could conceivably lead to the creation of a new palatal affricate, **c**, in CN.

There is a tendency for an epenthetic high vowel (front or back, copying the point of articulation of the next following vowel) to appear between **-rk-** and **-lk-** sequences.

person singular) or **-bb-** (root final **p** + pronominal **bú** ‘second, third person plural).

⁵⁷ One of the few difficulties with English pronunciation observed among the Chamba is the tendency to convert *sk* to *ks* (*ask* > *ax*)

⁵⁸ There is an imperative suffix **-n** which may be applied to CVC verbs. In such case, the final C is assimilated to nasality and the suffix is assimilated to the point of articulation of C leaving a single nasal consonant.

The **n/ŋ** contrast tends to disappear phonetically before **-k-**, with **n** assimilating its point of articulation to the following velar, although it remains apical in careful pronunciation.

1.8 RULE 5:

- a) The apicals in table 2 may not be preceded by apicals. Stops are voiced in this context⁵⁹.
- b) The apical **-r-** may not be preceded by nasals.

-bl-	-ml-	*-rl-	*-ll- (Rule 1)	*-nl-	*-sl- (Rule 2)	-gl-	-ŋl-
-br-	*-mr-	*-rr- (Rule 1)	*-lr- (Rule 4)	*-nr-	*-sr- (Rule 2)	-gr-	*-ŋr-

Table 12

There are two unproductive verb derivational suffixes **-rɪ** and **-lɪ** (causative and applicative, respectively). In addition, there are well-attested **-Cr** and **-Cl-** sequences in nominals. The tight restrictions on forming sequences with other consonants may have had a causal effect in limiting the productivity of these verb suffixes (and perhaps even in the near elimination of noun classification).

1.9 Rules 1 to 5 are applicable across all the major grammatical categories, to the exclusion of reduplicated terms, in which practically any word-final consonant can be found before any initial consonant. They may also not apply to compounds; the more consciousness of compounding is lost, however, the more such terms will be adapted to these rules.

Rule 5 shows that CN avoids apical sequences. This restriction is countered by Fulfulde loanwords ending in **-tV**, **-dV**, and **-nV** which may be preceded by other apicals. As a result, some rules are broken: 1 (gemination of **t**, **d**, **n** and **l** is common), 2 (at least **-st-** and **-sn-** are attested in my data), 3 (**rn-** is attested in addition to **-sn-**), and 4 (**-lt-**), but curiously the most restrictive rule, the fifth, is not broken by any loanword I have observed. Indeed, **t**, **d** and **n** maintain a phonetic identity distinct from **l** and **r** in this context, so that there is, strictly speaking, no violation of the rule 5.

1.10 There are two additional rules involving nasal consonants. The first concerns nominals and verbs; the second, verbs alone.

RULE 6: There are homorganic nasal-stop sequences in nominals for all fortis articulations in Table 2. The stop component is voiced in **mb**, but is generally devoiced in **nt**, **ŋk**, **ŋkp**, and is always devoiced in **ns**. With the exception of the latter, such sequences are likely to be innovations. Some may have resulted from borrowing, others may have been created as earlier compounds became monomorphemic. Despite the clear tendency of nasal-oral consonant

⁵⁹ As a general rule, voiced allophones of final stops precede voiced consonants.

sequences to become homorganic in various contexts, it has been decided to retain a diphonemic analysis, as there are various nasal-oral sequences in derivatives and compounds which are not homorganic⁶⁰.

RULE 7: Owing exclusively to the resulative suffix **-mèn**, **-m-** may appear regularly after velars **-k-** and **-ŋ-** and irregularly after the apicals **-r-** and **-n-**. The **-km-** group tends, however, to merge phonetically with **-ŋm-**.

1.11 The preceding rules fail to cover consonant sequences in only two probably native nominals in the entire nominal and verb lexicons: **kàrbàŋ** ‘pin-tailed whydah’ and **kàŋmà** ‘impotent’. Remarkably, they are also sufficient for all but a handful of loanwords, viz.

a) those with consonant sequences having a semivowel, **w** or **y**, in first or second position;

b) those having **r** in first position and an apical or a labial in second position, cf. **múrtàlá** ‘20-Naira banknote’, **ardo** ‘leader’ (Ffde *ardò*), **wùrdè** ‘scent’ (Ffde *urdi*); **kàrfi** ‘o’clock’ (Hausa *kàrfèe*), **yìrbì** ‘cover with a calabash’ (Ffde *hirba*).

c) those with a labial followed by **-t-**, cf. **kúptà** ‘gown’ (Hausa *kúftàa*), **sùptì** ‘choose’ (Ffde *subta*), **sēm̀tì** ‘be shy’ (Ffde *semta*).

Given that native ideophones already push back the limits of the rules described above, the weight of infringements seems insufficient to cause any major instability in the system as a whole.

⁶⁰ Furthermore, if we allow ourselves to mix native and imported lexicon, we can obtain voiced/unvoiced contrasts for all NC sequences except labiovelar C: cf. **jàmbá** ‘fraud’ (Hausa *zàmbá*), **jómpà** ‘jumper, pullover’ (Hausa *zámfàa*); **bāndī̀kò** ‘family, clan member’ (Ffde *bandiiko*), **bēntḕerè** ‘loincloth’ (Ffde *benteere*); **sā̀njì** ‘change’ (Hausa *cánjì*), **jā̀nsì** ‘breed many’, irregular pluractional of **jà̀àn** ‘breed’; **jā̀nggì** ‘learn, read’ (Ffde *jannga*), **jā̀ngkì** ‘throw many’ (fr. *jā̀ng*). Note also a single instance of native **-nj-** in the lexeme **mā̀njū̀m** ‘antelope sp.’ (cf. 1.4), available for contrast with **-ns**. This seems to be a former compound whose first term was **mā̀t** ‘chief’s place’.

III. TONOLOGY

1.1 CN is a three-register language: it lexically contrasts high (H), mid (M), and low (L) tones which stand, each to the next, in a single melodic step relationship. These are noted á (H-tone a), ā (M-tone a), and à (L-tone a). The tone-bearing units of CN are the vowels, initial syllabic nasals (always dependent subject pronouns), and nasal verb suffixes⁶¹. The registers can be combined to form contours: HM (áā), HL (áà)⁶², ML (āà), LH (àá), LM (āā), LHL (àáà)⁶³. The presence of a contour tone lengthens its tone-bearing unit and neutralizes the long / short vowel contrast. Length is thus irrelevant to a vowel's ability to bear a given contour tone.

CN also has a phenomenon of tonal *downstep* (marked here by the symbol ! preceding the first affected syllable), which is to some extent unusual. A detailed description of this phenomenon appears below, following the presentation of the *tone classes*, but some initial remarks are required here.

The HM contour is peculiar. There are rare cases where this contour is followed by a H tone. In general, however, the following tone can at best be identical to the second component of the contour and, if not, be either one or two steps below it. This is equivalent to saying that there is no distinction in this case between HM and H!H, and this is indeed the case since each requires moving a single melodic step down. Whether that step moves to a M or a downstepped H tone depends not on the melodic interval but solely on the behavior of the following tone, whose identity is known since it belongs to the following morpheme.

It can also happen that the HM contour is not realized as such, but rather as H alone. In such case, the following tone must be at least one step lower and may be two or three steps lower.

The LH contour is also peculiar. Indeed, the following tone can never be at the same level as its second component. Rather it must be at least one step lower and may be two or three steps lower. This is equivalent to saying that the LH tone is in fact LHM and this is how it is realized in isolation or in utterance-final position. Since there is no LH / LHM contrast, however, we will assume this contour is the simplest of the two, namely, LH.

This brings an additional problem: the H component in LH is assumed to be structurally H, not just a realization of HM. There is little that then stands in the way of taking HM, not as a contour tone with two components but rather as a special kind of H tone.

⁶¹ When these suffixes follow consonants, assimilation occurs to reduce the resulting sequence to a single nasal consonant. To simplify notation, we therefore note the tone associated with the suffix on the preceding vowel.

⁶² This contour entails the phonetic gemination of the C in a following CV sequence.

⁶³ The triple contour is rare and seems to be tending towards merger with HL by shortening and ultimate disappearance of the initial L component. The same reductive tendency affects the LH-L and L-HL patterns on disyllabic nominals. Where these patterns are conserved, they are furthermore often found in free variation on the same lexeme.

Some years ago, Béarh and Link developed a description of the Kru language Wobe in which they made use of a feature \pm Contour on the same footing as features like \pm High and \pm Low. This brought a virulent response from “autosegmentalists” (Singler) shedding doubt on the accuracy and completeness of their analysis. In recent years, I have done research on the Kru isolate Seme, spoken in Burkina Faso, and I have not been able to escape the conclusion that, whether or not their mode of analysis was adequate, their intuition in positing contour tones as single units was accurate. CN is far more mainstream Niger-Congo than the Kru languages in regard to its tone system. Still, the difficulty in treating the HM tone stands out sharply and requires an approach from a wider perspective

1.2 The tonological description of CN, like the description of its vowel system, must to some extent be relativized to grammatical categorisation. There is, in particular, a fundamental distinction between nominals and verbs. Let us therefore begin with nominals and nominallike terms, and examine the sets of tone patterns which may be associated with each possible canonic form. Whenever possible, monomorphemic examples will be provided so as to avoid any interference with the tone patterns of affixes⁶⁴.

	<i>CVV</i>	<i>CVC</i>	<i>CVVN</i>
H	póó ‘grass’	mót ‘day’	bóón ‘granary’
M	sāā ‘bird’	dōp ‘bean’	gāām ‘horn’
L	wùù ‘room’	bèp ‘fat’	bààn ‘hoe’

Table 13A. Monosyllabic level-tone patterns

	<i>CV(V)CV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
H-H	dú má ‘vulture’ bóó sí ‘mosquito’	kpá tsá ‘pit’ kú mlí ‘cotton’	bú súm ‘bush sp.’ fá rén ‘bishop bird’	yáksúm ‘play’ búksén ‘unloved’
M-M	nwōnā ‘dog’	jūglā ‘nest’	gbālāng ‘kind of trap’	***
L-L	kò nà ‘smallpox’ wìlì ‘rat sp.’	pùksà ‘foam’	bàrùp ‘twin’ nàmèn ‘crocodile’	pèglùm ‘Beni-seed sp.’

Table 13B. Disyllabic level-tone patterns

⁶⁴ Terms which can be derived by regular processes from an attested verb, particularly those involving an **-en** suffix, will be treated in a separate part of the section on verb morphology.

Table 13B requires several comments.

In polysyllabic vowel-final canonic structures, final **-a** and **-i** are massively more frequent. When examples of both exist, they are given in Table 13B. The attestations are, however, strongly skewed. For example, among the 29 attested nominals with CVCV structure and H tone pattern, there are 29 with final **-á**, but only 14 with final **-í**. Even worse, with this structure and L tone, there are 24 with final **-à** and only 2 with final **-ì** (including **wìlì** ‘rat sp.’ in Table 13B). Lastly, with M tone, there are 5 with final **-ā** but none with final **ī**. On the other hand, in CVCCV form, 12 lexemes with H tone have final **-í** while only one has final **-á**, so that **kpátsá** ‘pit’ in Table 13B is exceptional. For L tone, the situation is again reversed: 6 have final **-à** but none has final **-ì**; and for M only one has final **-ā** (**jūglā** ‘nest’ cited in Table 13B) and there is still none with final **-ī**.

It is hard to think statistics like these cannot be interpreted with a bearing on historical features such as a lost noun classification system. I took such an approach (1980) in dealing with Zande phonology, and it could be developed at length for CN⁶⁵. The subject will nevertheless not be pursued here.

In CVCVC form as in all disyllabic lexemes, M pattern is scarce: **gbālāng** ‘kind of trap’ is practically unique. This may in part be because the M tone pattern, which is used for the verbal noun of all CVC verbs (formed by suffixing **-ēn** to the verb root with M tone), has been preempted for this use. A few verbal nouns such as **vīrēn** ‘voice’ (< **vīt** ‘call’) have nevertheless taken on specific meanings which enable them to behave as nonverbal nominals.

The immense majority of consonant-final disyllabic lexemes (reduplications excluded in the case of CVCCVC) end in one of the three nasal consonants, **-m**, **-n** or **-ŋ**. The stops **-p** and **-k** are rare, **-t** and **-y** almost unknown. The lexemes ending in **-m** are often derived from verbs, and those in **-n** from nominals and verbs. Those ending in **-ŋ** are not derived. Among H-tone CVC(C)VC lexemes, almost all are derived. The exceptions like **tānglāng** ‘kind of bell’ have an ideophonic feature.

The relationship between the tone pattern of derivatives in **-m** and **-n** to the tone of their base is not always patent. H-tone CVC(C)VC derivatives are nevertheless clearer than most and can usually be related to H-tone CV(V)C base verbs or nominals or to L-tone CV(V)C verbs which have ML cognates in the Mapeo dialect. The question of the tonal processes involved in derivation will be taken up at another time.

1.3 We now turn to those tone patterns which involve a single change of register.

1.3.1 Monomorphemic monosyllables can only have three such patterns.

⁶⁵ Konstantin Pozdniakov (p.c.) has recently attempted to work out a general application of this approach.

	<i>CVV</i>	<i>CVC</i>	<i>CVN</i> ⁶⁶
HM	tíi ‘head’	béēp ‘iron’	láām ‘sleep’
HL	yáà ‘leaf’	pîp ‘sour tomato’	núùn ‘nose’
LH	kpàá ‘chicken’	wàák ‘kind of grass’	kàḗn ‘crab’

Table 14A. Monosyllabic patterns with a single change of register

LM tone on CVV can be obtained by irregular inclusion of the tonal component of the locative marker *ī* in certain L-tone CVV heads, e.g., *nàà* + *ī* > *nàā* ‘in (+ nominal)’. There are, however, no monomorphemic items of this form.

A single case of ML has been reported: *gāàn* ‘shrub sp.’ This tone pattern exists in the Mapeo dialect but has been replaced by L in CN. This example may therefore be imported from a nonstandard dialect.

1.3.2 Disyllabic lexemes show these same patterns, but when the first tone is high, the pattern may be distributed in different ways over the two syllables: H-M and H-HM, H-L and H-HL.

Unlike monosyllables, disyllables have M-tone initial patterns, M-H and M-L. In addition, there is a L-M pattern.

⁶⁶ Length distinctions are no longer pertinent under contour tones.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
H-M	nínā ‘bone’ kúsí ‘stick’	vírkā ‘darkness’ ⁶⁷ nwótsí ‘old age’	kúsūm ‘mountain’ gákēn ‘dangerous’	bárkūm ‘kind of guinea-corn beer’
H- HM ⁶⁸	dáláā ‘heap’	lúgrāā ‘weak’	báréēn ‘broken’	kpágrúūm ‘tree sp.’ dúngléēn ‘erroneous’
H-L	mákà ‘clay’ sóri ‘rat sp.’	kúmsà ‘hairstresser’s needle’	léḗrūm ‘mildew’ kpásèn ‘ladle’	kárbàng ‘pin-tailed whydah’ sápsèn ‘different’
H-HL	***	***	***	gágrúūm ‘grass sp.’ nyírkéēn ‘soot’
M-H	būrá ‘ <i>Vitex</i> sp.’ bísí ‘dish’	dāglá ‘round’ gípsí ‘hair’	bākūm ‘tree sp.’ jāngén ‘lizard sp.’	mēnsén ‘dew’
M-L	pārà ‘axe’	gūnglā ‘polishing stone’	***	***
L-M	bīsā ‘kind of tree’	tāmsā ‘spider’s cocoon’	sākūm ‘bush sp.’	mānjūm ‘antelope sp.’
L-H	būnjá ‘tree sp.’ dūrí ‘rain’	kōmsá ‘flour sifter’ gbànsí ‘vapour’	bānūm ‘tree sp.’ kāmén ‘priest’	bēnglūm ‘plant sp.’ sànglén ‘rude’

Table 14B. Disyllabic patterns with a single change of register

Again, frequency of association of the different patterns with canonic structure and phonological makeup vary widely. For example, **mānjūm** ‘kind of antelope’, perhaps originally a compound (cf. 1.4), is unique (cf. nevertheless **tāksīn** ‘tomorrow’). Likewise, the only attestations of the H-HL pattern are those cited in Table 14B.

The ML pattern for native CVCV and CVCCV nominals is very scarce and used only for $V_2 \neq i$, i.e., for terms which cannot be verbs. **Gūnglā** ‘polishing stone’, derived from **gūnglì** ‘polish’ by an unproductive process, is practically a unique example, though CVCV **tōḡkì** ‘poison sp.’, the pluractional of **tōḡ** ‘touch, apply with the finger’, seems also to have acquired a possible nominal function. It may be assumed that these forms with final -ì have been preempted for use with disyllabic verbs.

⁶⁷ There is a tendency toward free variation between H-M and H-HM in this canonic form.

⁶⁸ In the Mapeo dialect only monosyllabic nominals can display a HM contour. The origin of the generalised contrast in CN (which may or may not be inherited) is an unresolved question of considerable interest.

1.4 We now examine patterns involving two changes of register.

1.4.1 There is only one such pattern, LHL, borne by monosyllabic lexemes and the only attested instances of this pattern are in Table 15A.

	<i>CVV</i>	<i>CVC</i>	<i>CVN</i>
LHL	màáà ‘?’	***	fàáàn ‘tortoise’ jèèèm ‘women’s cult’

Table 15A. Monosyllabic pattern with two changes of register

Màáà appears in a bird name, **sāā màáà** ‘Kittliz’s sandplover’.

This contour simplifies by dropping its initial L component. It may have been more frequent in the past, but its identity now seems threatened.

1.4.2 There are many patterns of this kind for disyllabic lexemes. Distribution over the two syllables varies for patterns beginning with either H or L:

HL-H and H-LH,

L-HL, LH-L and LH-HL,

L-HM, LH-M and LH-HM.

Only L-ML and M-HM have a single distribution.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
HL-H	péèlá ‘wide open’ kpààní ⁶⁹ ‘plant sp.’	bùùgrí ‘kind of grass’	nyààgán ‘warrior’	sùgrén ‘season’
H-LH	***	***	sálàát ‘thorn plant sp.’	***
L-HL	dímáà ‘back’	sùksáà ‘jingles’	bùrèèn ‘fallow field’	tùtsûn ‘comb wasp’
LH-L	díísà ‘owl’ nyííkì ‘electric catfish’	gbòómsà ‘sickle’	nyíínèn ‘shade’	sòógrùm ‘plant sp.’ nyíínlèn ‘charcoal’
LH-HL	***	kpùúgráà ‘?’	***	***
L-HM	dòkáā ‘agama lizard’ jààrí ‘thorn tree sp.’	gèngsáā ‘tree sp.’	sòkúūm ‘junior’	gbèngléēn ‘bent’ sàmpáāy ‘plant sp.’
LH-M	nwàáli ‘plant sp.’	kàámsā ‘sack rattle’ tàámsí ‘sheep’	***	***
LH-HM	***	làántáā ‘kind of hair’	làátáām ⁷⁰ ‘kind of legendary plant’	***
L-ML	***	***	kìlèèn ‘loan’	fàgrèèn ‘aardvark’
M-HM	gēēráā ‘sand’ nānī ‘?’	bōbrāā ‘mud’ nīnglī ‘welt’	bākèèn ‘without soup’	tōmséēn ‘hardworking’

Table 15B. Disyllabic patterns with two changes of register

⁶⁹ This pattern, like LH-L, seems to allow simplification to H-L by loss of the initial component.

⁷⁰ This term can also be realized làám-táām or with the nasal assimilated to làántáām, suggesting compounding though neither component can be identified.

It will be noticed that the L-ML pattern is in complementary distribution with the L-M pattern according to canonic structure: consonant-final for the former and vowel-final for the latter.

The M-HM pattern corresponds to the verbal noun of verbs with the canonic forms CV(V)CV or CVCCV + suffix *-ēn*⁷¹. There is nevertheless a good number of such terms without a base verb. In Table 15B, **bākēēn** ‘without soup’ (describing **túm** ‘mush’) is an example. Even **tōmsēēn** ‘hardworking’ is from an apparently unused causative **tōmsi*, itself from **tóóm** ‘send, do (work)’.

The examples of H-LH, LH-HL and LH-HM patterns are unique in the class of nominals, but these patterns may reappear in reduplicated nouns and ideophones.

The definition ‘?’ again means that terms involved are used descriptively in plant or animal names and have no known independent meaning. Thus, **kpùúgráà**, for example, appears only in the bird name **dándán !kpùúgráà** ‘grey wood pigeon’ where **dándá/án** is already the generic term for ‘pigeon’.

1.5 Only dissyllables can have patterns involving three changes of register. There are only two such patterns, and only one distribution for each. Examples are extremely rare, though others are found among reduplicated nouns.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
HL-HL	***	gbòòmsáà ‘chin’ dáàgláà ‘round’	***	***
HL-HM	tàámáā ‘nightjar’	sààgráā ‘(hen) having laid no eggs’	***	***

Table 16. Disyllabic pattern with three register changes

1.6 Let us now reconsider these data in terms of the suggestion that HM is not properly speaking a contour tone but rather a special kind of tone that is realized with a contour when in final position. Rather than using the expression “register changes”, we should prefer “tone changes” since we are speaking only of moving from one tonal identity to another.

1.6.1 Table 13A will then be as Table 13A*:

⁷¹ It is also used for attributive nominals derived from other M-tone morphemes, cf. **bīnēēn** ‘forward, later’ < the head **bīn** ‘front, before’.

	<i>CVV</i>	<i>CVC</i>	<i>CVVN</i>
H	póó ‘grass’	mót ‘day’	bóón ‘granary’
H!	tí!í! ‘head’	bé!p ‘iron’	lál!ám ‘sleep’
M	sāā ‘bird’	dōp ‘bean’	gāām ‘horn’
L	wùù ‘room’	bèp ‘fat’	bààn ‘hoe’

Table 13A*

This table includes the canonic segmental forms *CVV* and *CVVN*. The HM patterns for these forms are converted to two identical tones, H!H!, just as for the other patterns represented. Intuitively, this represents the condition that, if a lexeme with this pattern appears in final position, the initial H! will cause the second to position itself one step lower while, if the lexeme is not in final position, the two tones will be identical, but will cause the next following tone to be lower by one step with respect to what it would have been after H. For the *CVC* forms, however, only one vowel is represented and the HM pattern is therefore converted to CV!C. We will see below how this representation represents the real situation.

In the same way, Table 13B will be converted to Table 13B*.

	<i>CV(V)CV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
H-H	dúmá ‘vulture’ bóósí ‘mosquito’	kpátsá ‘pit’ kúmlí ‘cotton’	búsúm ‘bush sp.’ fáren ‘bishop bird’	yáksúm ‘play’ búksén ‘unloved’
H!-H!	ní!ná! ‘bone’ kú!sí! ‘stick’	ví!rká! ‘darkness’ ⁷² nwó!tsí! ‘old age’	kú!sú!m ‘mountain’ gál!ké!n ‘dangerous’	bá!rkú!m ‘kind of guinea-corn beer’
M-M	nwōnā ‘dog’	jūglā ‘nest’	gbālāng ‘kind of trap’	***
L-L	kònà ‘smallpox’ wìlì ‘rat sp.’	pùksà ‘foam’	bàrùp ‘twin’ nàmèn ‘crocodile’	pèglùm ‘Beni-seed sp.’

Table 13B*

⁷² There is a tendency toward free variation between H-M and H-HM in this canonic form.

Again, in H!-H!, downstep will occur after the first syllable if the lexeme is final, and after the second if it is non-final. In the latter case, both tones will be heard at the same level.

1.6.2 Table 14A is now simplified.

	<i>CVV</i>	<i>CVC</i>	<i>CVN⁷³</i>
HL	yáà ‘leaf’	pîp ‘sour tomato’	núùn ‘nose’
LH!	kpàá! ‘chicken’	wàá!k ‘kind of grass’	kàá!n ‘crab’

Table 14A*

As mentioned in 1.0, LH is followed by downstep. Its final component may therefore be written like the other downstep-inducing tones.

Table 14B will need three major changes:

1) H-M moves to Table 13B*.

2) H-HM becomes H-H!. Indeed, the first tone in the latter pattern is properly H and has no effect on the following one. The final M, however, is again the downstep-inducing H!. There is no length contrast in this second-syllable position; they vowel may therefore be consistently represented as short.

3) M-HM moves here from Table 15B. Its second component is again represented as H!.

It must be noted that L-H remains unchanged since its second component is not associated with downstep. However,

4) L-HM too must be moved here from Table 15B and represented as L-H!.

5) L-HM allows distribution as LH-HM attributed to two exceptional lexemes, perhaps in fact to a single one, given their similarity and their expressive content. The LH component is in fact LH! as in monosyllables. It is followed by another downstep-inducing tone and therefore allows only one tone change in the form LH!-H!.

⁷³ Length distinctions are no longer pertinent under contour tones.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
H-H!	dá!lá! ‘heap’	lú!grá! ‘weak’	bá!ré!n ‘broken’	kpá!grú!m ‘tree sp.’ dú!nglé!n ‘erroneous’
H-L	má!kà ‘clay’ só!rì ‘rat sp.’	kú!m!sà ‘hairstresser’s needle’	lé!é!rù!m ‘mildew’ kpá!sè!n ‘ladle’	ká!r!bàng ‘pin-tailed whydah’ sá!psè!n ‘different’
H-HL	***	***	***	gá!grú!m ‘grass sp.’ nyí!rké!n ‘soot’
M-H	bū!rá ‘ <i>Vitex</i> sp.’ bí!sí ‘dish’	dā!glá ‘round’ gī!psí ‘hair’	bā!kú!m ‘tree sp.’ jā!ngén ‘lizard sp.’	mē!nsén ‘dew’
M-H!	gē!ē!rá! ‘sand’ nā!ní!í! ‘?’	bō!brá! ‘mud’ ní!nglí!í! ‘welt’	bā!ké!n ‘without soup’	tō!msé!n ‘hardworking’
M-L	pā!rà ‘axe’	gū!ng!là ‘polishing stone’	***	***
L-M	bì!sā ‘kind of tree’	tā!m!sā ‘spider’s cocoon’	sà!kū!m ‘bush sp.’	mā!njū!m ‘antelope sp.’
L-H	bū!n!já ‘tree sp.’ dū!rí ‘rain’	kō!m!sā ‘flour sifter’ gbā!nsí ‘vapour’	bā!n!ú!m ‘tree sp.’ kāmén ‘priest’	bē!ng!lū!m ‘plant sp.’ sā!ng!lén ‘rude’
L-H!	dò!ká! ‘agama lizard’ jà!à!rí! ‘thorn tree sp.’	gē!ng!sā! ‘tree sp.’	sò!kú!m ‘junior’	gbē!ng!lé!n ‘bent’ sā!mpá!y ‘plant sp.’
LH!-H!	***	là!á!ntá! ‘kind of hair’	là!á!tá!m ‘kind of legendary plant’	***

Table 14B*

1.6.3 Table 15A is thus the only one to undergo no change. Table 15B* loses L-HM (> LH!), M-HM (> M-H!) and LH-HM (> LH!-H!) to table 14B* but takes in HL-HM (> HL-H!) from Table 16. Former LH-M has an initial LH! component, but in this case, the final tone cannot induce downstep on any following tone and is different from the preceding H!, so that there are two tone changes⁷⁴. The H! tone in LH! contours is written H(!) when a following tone in the same lexeme prevents it from having any further influence.

⁷⁴ This pattern has in fact two realizations, one as LH!-H which cannot be followed by any higher tone and another as LH!-M which can be followed by a tone which is one step higher.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
HL-H	péḗlá ‘wide open’ kpáàní ⁷⁵ ‘plant sp.’	búùgrí ‘kind of grass’	nyáàgán ‘warrior’	sîgrén ‘season’
HL-H!	táàmá! ‘nightjar’	sáàgrá! ‘(hen) having laid no eggs’	***	***
H-LH!	***	***	sálàát ‘thorn plant sp.’	***
L-HL	dímáà ‘back’	sùksáà ‘jingles’	bùrèèn ‘fallow field’	tùtsîm ‘comb wasp’
LH(!)-L	dîísà ‘owl’ nyîíkì ‘electric catfish’	gbòòmsà ‘sickle’	nyîínèn ‘shade’	sòógrùm ‘plant sp.’ nyîínlèn ‘charcoal’
LH(!)-HL	***	kpùúgráà ‘?’	***	***
LH(!)-H	nwáá!lí ‘plant sp.’	kàá!msá ‘sack rattle’ tàá!msí ‘sheep’	***	***
L-ML	***	***	kîlèèn ‘loan’	fàgrèèn ‘aardvark’

Table 15B*

1.6.4 Table 16* loses HL-HM to Table 15B* where it now appears as HL-H!.

	<i>CVCV</i>	<i>CVCCV</i>	<i>CVCVC</i>	<i>CVCCVC</i>
HL-HL	***	gbòòmsáà ‘chin’ dáàgláà ‘round’	***	***

Table 16*

⁷⁵ This pattern, like LH-L, seems to allow simplification to H-L by loss of the initial component.

We may remark that, in this way, we obtain a more balanced distribution of canonic tone forms with the greater number now falling into Table 14B* which contains the most frequent lexical forms.

I do not doubt that I will be accused of wasting the reader's time with propositions that do not respect the tried and proven mode of analysis. I would nevertheless beg the reader's leniency and request that due consideration be given to the fact that what we see when we use the representations of that mode of analysis does not well fit the realities we find ourselves dealing with. I am seeking only to find a representation that will be an expression of the rules we are led to formulate and be easily interpretable within the framework of those rules.

1.7 There are a few “trisyllabic” and “quadrisyllabic” canonic forms for nominals, primarily CV(V)CVCV and CVCCVCV, but they are so few in number and the tone patterns so varied, that they will not be presented in detail here. Many of the examples suggest the result of a compounding process.

1.8 Nominals may have reduplicated structure. Examples are relatively numerous for CVC and CVCV canonic forms, rather rare for CVCVC, and nonexistent for CVCCV(C). With regard to CVV, there is some difficulty involved in determining whether one is dealing with the reduplication of CVV or with a CV(V)CV term where $C_1 = C_2$ and $V_1 = V_2$. This difficulty derives from the fact that 1) there is not always a CVV source and 2) vowel length cannot be predicted.

1) **Kááká** ‘meat’ is not likely to derive from **káá** ‘pay (a fine)’ but there could have been some other CVV source, now lost.

2) The CVV source of **dōdō** ‘fall’ is the verb **dō** ‘fall’; the CVV source of **lōlō** ‘thumb’ is the verb **lō** ‘press with the thumb’. One retains vowel length and the other does not. Short vowels as in **sásá** ‘shame’ are therefore no proof that this term is CVCV rather than a reduplication of an indeterminate CVV.

Most cases of reduplication of CVC have no known simple source, yet are apparent from the resulting intervocalic consonant sequence composed of C_2 followed by C_1 . Reduplication of longer forms is self-evident.

1.8.1 The attested tone patterns are exemplified in Table 17.

<i>CVV CVV</i>	<i>CVC CVC</i>	<i>CVCV CVCV</i>	<i>CVCVC CVCVC</i>
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simple tone patterns repeated

H	kááká ‘meat’	mánmán ‘boomslang’	(sāā) lékílékí ‘hammerkop’	***
(M)	***	kpākkpāk (léérùm) ‘butterfly’	***	tōōrētōōrēn ‘kind of festival’
L	wààwà ‘small (intestine)’	dīngdīng ‘heavy’	vìrìvìrì ‘first light’	***
H-M / H!	***	séngsēng ‘cicada’	***	***

complex tone patterns repeated

HL	***	gàànggààng ‘mantis’	***	***
(MH)	***	***	kāátkārí ‘kind of plant’	***
ML	***	***	sāmāsāmà ‘pouch rat’	gílánggílàng ‘midpoint’
(LH)	(sāā) tàátàá ‘red- cheeked cordon bleu’	***	***	lòkòtlòkòt ‘batting (eyelids)’

inverted patterns

LH-HL	dīídî ‘?’	gùúmguùm ‘crowned crane’	pèsápèsà ‘plant sp.’	***
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patterns in contrast, single tone change

H-HM / H-H!	káákáá 'hedgehog', sáásáá 'shame'	dándáàn (< dààn 'swell')	***	***
(M-H)	***	yēyét 'millipede'	***	***
M-HM / M-H!	***	jānjāān 'domestic (animal)' (< jààn 'breed, nourish')	***	***
L-H	***	dàngdáng 'plant sp.' (< dàng 'be bitter')	***	gàlànggáláng 'hooked'
L-HM / L-H!	***	bàkbáāk 'sticky' (< bàk 'stick, follow')	***	***
(LH-HM / LH!-H!)	jèéjéé 'plant sp.'	***	***	***
L-M	gùùgù 'snail'	gònggōng 'snake sp.'	? jàmàjāmà 'kind of plant'	***

patterns in contrast, two tone changes

(HL-H)	***	jáákják 'hiccough'	***	***
0(HL-HM / HL-H!)	***	kīngkīng 'tree sp.'	***	***
(L-HL)	kòkòò 'woodworm'	***	***	***

Table 17. Tone patterns of reduplicated nouns

1.8.2 Table 17 may be divided into two sets: 1) repeated tone patterns and 2) contrastive tone patterns.

The first set includes the level tones H, M, L and H!, i.e., just those patterns appearing in Table 13A*. H, M and L reduplications appear with a variety of canonic forms though reduplicated M is very rare. H!, however, appears only with a CVC base.

This set also includes HL and the extremely rare LH from Table 14A. The first of these but not the second is found on nominals which are not reduplicated (Table 16). They are restricted to monosyllabic bases.

Let us also include tone inversion, LH-HL, in this set, since the second part of the pattern is in a sense constrained by the first. This pattern appears on disyllabic nonreduplicated nouns and is used freely with reduplicated nouns of all canonic forms.

Finally, this set includes M-H and M-L from table 14B which can only appear with polysyllables. M-H is represented by a single example, originally **kārīkārī**, where the final -í may be treated as an extension and dropped, giving rise to a MH contour on the first or on both syllables which does not appear on simple CVC nominals.

The H tone on the second syllable of ML-ML lexemes is obtained by a rule applying elsewhere in CN tonology which will be discussed below.

The second set in Table 17 is made up of reduplications which copy the segmental structure and not the tone pattern. These involve either one or two tone changes. If we refer to Table 14B* for cases of a single tone change, we will find that all patterns present there are used for reduplicated nouns with the exception of H-L, H-HL and M-L. It would seem that H-L has been preempted by reduplicated ideophones but HHL and M-L are used only for nonreduplicated nouns. LH!-H! is extremely rare and may be only a variant of tone inversion, LH-HL (see below for HL-H!).

Cases of two tone changes are exceptional among reduplicated nouns. All have distinguishing irregularities:

- 1) HL-H has a HL-M variant.
- 2) HL-H! is HL-HL for some speakers
- 3) L-HL is found only with CV reduplication.

The only cases of three tone changes in reduplicated nouns occur when both tone pattern and segmental structure are copied.

Table 17 shows that canonic reduplication operates on CVC. The more frequent patterns are deployed on CVCV and on CV(V), while CVCVC remains rare.

1.9 There is strictly speaking no tonal inflection of nominals; they are, however, affected by a phenomenon of downstep, the rules for which will be discussed below. Verbs, on the other hand, have a very limited inventory of possible tone patterns, but are subject to the tonal inflection described below in the section on “Verb inflection”. The only tone patterns for the lexical form of verbs (see below) are these:

	<i>CVV, CV(V)C</i>	<i>CV(V)CV, CVCCV</i>
H	téé ‘take’ pút ‘be tired’ gáám ‘talk’	***
L ⁷⁶	kùù ‘pound’ bàk ‘follow’ sììn ‘be full’	***
ML ⁷⁷	***	mēri ‘carry’ bānèn ‘be together’ tāāli ‘sew’ bāāmèn ‘explode’ jigrì ‘shake’ bāṅlèn ‘tiptoe’

Table 18. Verb tone patterns

1.10 We now present a brief discussion of downstep in CN.

The first point to made is that downstep can only occur with respect to a high tone. Downstep is never observed after a M or a L tone.

Secondly, downstep, wherever it occurs, is “general”, i.e., its effect is to lower the set of registers by one step with respect to what it would have been without downstepping. Hence, a downstepped H tone sounds M, M tone sounds L, and L tone is infralow.

Thirdly, downstep is “triggered” in three different ways.

1.10.1 i) A LH contour triggers downstepping. Such downstep may occur within a morpheme (as in **tàámsí** ‘sheep’) or apply first to the initial tone of any morpheme following a final LH contour tone on the preceding morpheme, whether the morphemes are within the same phrase or in successive phrases.

ii) Downstep may be a syntactic marker, as when it appears after any final H tone on a verb or its enclitics; thus, an intonational fault is introduced between verbs and whatever follows, whether it be a direct object, a modifying particle, or some other element⁷⁸.

The triggering H tone on the verb may be either original (as in the case of any verb belonging to the H tone class or any plural enclitic pronoun), or derived (as in the case of the H

⁷⁶ A M (realized ML) class attested in Mapeo Chamba has merged in CN with L.

⁷⁷ Mapeo Chamba retains a M-L/L-L contrast.

⁷⁸ The mechanism will act even in verb sequences, e.g., **kú díngrí lkú yákí (ljé pát)** ‘let him reply to all of them’.

tone assigned to the final syllable of a disyllabic verb a) before a H-tone enclitic pronoun (if the verb is transitive), b) before the verbonominal suffix, c) in a negative proposition, and d) in a relative proposition.

This type of downstep may be iterative over H tones within a construction, as when a H-tone enclitic follows a final H tone on the verb. Downstep then occurs twice, first between the verb and its enclitic, then between the enclitic and the following constituent.

Syntactic downstepping of an identical nature occurs after the injunctive marker **ká** ~ **gá**.

The downstepping described by i) and ii) does not contrast with its absence. It does therefore not need to be represented orthographically. All these cases of downstep might be subsumed under three “grades” representing types of association of H and L tones: in grade 1, it results from LH contours; in grade 2, it results from derived H tones which have been switched from L to H by a grammatical rule; and in grade 3, it results from the lexical H tone of morphemes in a H-tone class standing in contrast with a L-tone class, a M-tone class being excluded. Both verbs and some enclitic object pronouns are grade 3.

1.10.2 iii) Downstep may be associated with the HM tone pattern.

a) If not in utterance-final position, any lexical HM pattern on a CVV or CVVN morpheme will appear as H!H.

b) If not in utterance-final position, any lexical HM pattern on a CVC morpheme becomes H and triggers downstepping of the following constituent. In utterance-initial position, it becomes suprahigh if we assume that, as usual, L is the base or unmarked tone in the register system.

c) In disyllabic terms, the pattern may be spread over successive syllables, and H-M likewise becomes H-!H in nonfinal position.

d) If not in utterance-final position, any lexical HM pattern on the final syllable of a polysyllabic morpheme becomes H and triggers downstepping of the following constituent.

e) In composition, the HM contour of CVV and CVVN terms may be shortened to H followed by downstepping as after CVC.

From these specifications, it becomes clear that the appearance of modulation is possible only on long vowels and in final position. Such modulation contrasts with simple H and therefore requires an orthographic representation.

1.10.3 Certain grammatical items with HM tone display a residual HM behavior with no downstep in certain contexts. These include the third person pronouns **góōn** ‘singular’, **bóōn** ~ **vóōn** ‘plural’, **géēn** ‘inanimate’, the evidential **béēn**, and the verbonominal suffix **-éēn** of CVC(C)ì verbs. These morphemes show HM tones before a following H or M and shift to H!H only before following L. The logophoric subject **mínēn** also behaves in this way.

A similar exception involves the verbonominal suffix of CVC(C)èn verbs. The resulting

form is CVC(C)é!nēn before H and M but CVC(C)é!nén before L.

These residual forms are not universally produced. Regular HM > H!H behavior is also attested.

1.10.4 If we treat the HM contour not as a composite entity but as unitary, a special kind of H tone, we observe little to differentiate the two solutions with regard to downstep following LH modulation. It is simply the case that the rising tone in CN is realized LH! but contrasts with no other rising tone.

The situation is rather more complex with regard to cases of what we have called “syntactic downstep”. Let us look first at the case of the evidential morpheme which appears in final position as éēn. Medially before consonant, one finds é followed by downstep, and before vowel, én followed by downstep. With the exception of the loss of -n medially before consonant, this morpheme behaves no differently from morphemes in any other class. Its lexical form could remain éēn. This would be é!n in terms of a unitary HM and would be realized HM in final position but as H followed by downstep medially before consonant. Before vowel, we would find é!.

The injunctive morpheme ká may appear in final position where its vowel remains short and its tone unmodulated. Medially, it is followed by downstep. It could be represented as ká! in all positions only on the condition that long vowels bearing H! in final position be marked H!H! as we have done in table 13A.

This has consequences for the representation of the evidential morpheme. Contour tones require vowel lengthening. We might therefore prefer to restrict the representation é!n to medial position and use é!é!n for final position.

In CN verbs are not allowed utterance-finally. If a verb is elicited, one will find the CVV(N) and CVC verbs are reported with simple H or L tones which one will recognize immediately, even without a melodic expression, whether whistling or other, as soon as one becomes familiar with one’s interlocutor. Once the verbs are placed in an utterance, however, one will find H tone verbs will be followed by downstep. These facts will be captured by a lexical representation as C’V’V or C’V’C and by a representation in context as C’V’V!(N) or as C’V’!C.

This representation suggests the existence of a three-way contrast: C’V’V, C’V’V!, C’V’V!, but of course this is not the case. If we are dealing with nouns, we have only the contrast C’V’V, C’V’V!, and if we are dealing with verbs, we have no contrast at all, not even CV!, CVV! since the long vowel is nothing but the obligatory realization of a monosyllabic verb with no final consonant. Indeed, the long vowel is here behaving like a short vowel rather than respecting the rule that, given a long V, H! will modulate.

This discussion may lead us to conclude that verbs may have H lexical tone but must take H! tone when they predicate, i.e., H! is a kind of actualizer, to take Martinet’s (1954) term somewhat out of context. H! is thus inflectional here.

The behavior described for verbs where no contrast exists is of course unlike the behavior of nominals which contrast H and H!. This contrast takes precisely the form of the absence or presence of a modulation on long vowels. On short vowels, the contrast may only be visible in the respective number of steps down between the tone in question and the following one.

It is in a context of this kind that one can observe the initial signs of the transformation of H! into a suprahigh tone (see 1.9.2b). This process provides the motivation for treating what was surely a contour tone at the outset and continues to have modulated realizations as a single entity. If HM was originally composite, how does it later become the simple suprahigh? It does so by becoming unitary in an intermediate stage.

1.11 The preceding summary description should suffice to show that CN downstep is both a complex and a rather unusual phenomenon. Also unusual is the fact that it appears in this "*lingua franca*", while there is no trace of it in the Mapeo dialect. One might have expected such phenomena to arise locally rather than in the most widespread form of the language, spoken almost as a second language by many.

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