A grammar of Nchane: A Bantoid (Beboid) language of Cameroon

Boutwell, R.L.

Chapter 3

Phonological processes

A number of phonological alternations are observed, some of which occur due to contact between certain phonemes, and others which are likely fundamentally morphophonological in nature. The alternations due to adjacency of certain segments include nasal place assimilation, presented in §3.1, and high front vowel laxing, described in §3.2. Both of these alternations are illustrated by monomorphemic examples, with additional examples of occurrences at morpheme boundaries providing transparent evidence. Glide formation, which is covered in §3.3, is also likely a strictly phonological phenomenon. Section 3.4 describes the process of compensatory vowel lengthening, observed only in the Anaphoric 1 demonstrative. Vowel copying is a process clearly involving morpheme-morpheme interactions and is also limited to certain word classes. This process is described in §3.5. The chapter concludes with a presentation of spirantization in §3.6, which is observed in a small number of monomorphemic contexts as well as two cases conditioned by affixation.

3.1 Nasal place assimilation

As was stated in §2.1.5.1, the nasal of NC sequences usually matches the place features of the following consonant. This assimilation is seen in root internal NC sequences, as well as in NC sequences resulting from prefixation, with the process not applying in other types of affixation. Assimilation in root-internal NC sequences is illustrated in (3.1), by verbs as well as nouns.

(3.1)

[**m̄b**ɔ́]	*'melt'*
[**ŋ̄k**ù]	*'clap'*
[fī-**ŋk**ɔ̄]	*'cup' (c19)*
[dʒwī**ns**ɛ́]	*'man' (c1)*
[mwà**ŋg**á]	*'rabbit' (c1)*

The examples in (3.2) illustrate nasal assimilation across prefix-stem morpheme boundaries. Example (3.2)a shows assimilation of the first-person singular subject agreement prefix, (3.2)b of the nominalizer and (3.2)c of the nasal coda of the class 6a prefix.

(3.2)

a.

[**m̄-b**ɔ̄:]	*'I stab'*
[**ɲ̄-j**ɛ́ŋ]	*'I see'*
[**ŋ̄-g**ɛ̄:]	*'I go'*

b.

[**m̄-b**īlɛ̀]	*'question'*
[**m̄-f**ī:]	*'help'*
[kī-**n-t**ɛ̄ŋɛ̄]	*'argument'*

c.

[mā**m-b**īŋɛ̄]	*'bundle'*
[mā**n-d**ɛ̄]	*'bridge'*
[mā**ɲ-ʃ**ɪ́]	*'face'*
[mā**ŋ-k**ɔ́]	*'bridge'*

Selected examples to illustrate place assimilation of nasals followed by each of the non-nasal consonants are given in Table 3.1.

[m]	**[ɱ]**	**[n]**	**[ɲ]**	**[ŋ]**
[**m̄b**à]	[**ɱ̄f**ā]~[**n̄f**ā]	[**n̄t**ɔ̀ŋ]	[**ɲ̄tʃ**ō̞ŋ]	[mā**ŋ-k**ɔ́]
'soup' (c9)	*'eagle' (c1)*	*'cane rat' (c9)*	*'insult'*	*'ladder' (c6a)*
		[kī-**nd**ɔ̀ŋ]	[**ɲ̄dʒ**ō̞]	[kī-**ŋg**vù]
		'neck' (c7)	*'cloth'*	*'duck' (c7)*
		[fī-**ns**ɛ́sɛ̀]	[**ɲ̄ʃ**áŋ]	[**ŋ̀-w**īŋɛ̀]
		'louse' (c19)	*'soil'*	*'I open'*
		[**n̄l**ɔ̄]~[**ŋ̄l**ɔ̄]	[**ɲ̄-j**ɛ́ŋ]	
		'poison' (c1)	'I see'	

Table 3.1 Selected examples of Nchane word forms with NC sequences, illustrating nasal place assimilation.

The example given to illustrate the **ŋw** sequence is a verb with a **w** onset in order to clearly show which place features are assimilated by the preceding nasal. Otherwise, the **ŋw** sequence is ambiguous as to whether it represents a case of infixation, in which case the nasal is not expected to assimilate to the place of articulation of the **w**. See §§2.1.4.1 and 2.1.5 for details regarding the challenges of interpreting **Nw** sequences.

As indicated in the table, free variation is observed in NC sequences involving **[f]** and **[l]**. Nasals before **[f]** are realized as **[ɱ]** or **[n]**. Careful speech shows a preference for **[n]**. Nasals before **[l]** are realized as **[n]** or **[ŋ]**, with a preference for **[n]** in onset position and **[ŋ]** in coda position, although either realization can be observed in either environment. Similar variation is observed in Mungong in NC sequences at syllable boundaries where **[ŋ]** is sometimes observed in non-homorganic NC sequences (e.g., [bā**ŋʃ**ɛ̀] 'gather' and [kā**ŋs**ɛ̀] 'be alert').

Additionally, other CC types are also observed in the same syllabic context in Mungong, as illustrated in (3.3).

(3.3) (Mungong)

[kā**ŋn**ə̀]	*'squeeze'*
[gā**mt**ɨ̀]	*'protect'*
[kū**ks**ɛ̀]	*'alter'*
[tsà**ŋn**ī]	*'headpad'*

Otherwise, CC sequence restrictions and nasal place assimilation in Mungong is comparable to that of Nchane. See Boutwell (2011) for more details.

Besides the non-homorganic nasals in the alternative NC variants **[nf]** and **[ŋl]** given in Table 3.1, nasal place assimilation is otherwise strictly applied across the language. One regular exception is observed in cases of verb stems with nasal codas followed by the Causative suffix **-sɛ́**, as in (3.4). The nasal in these verbs is usually **[ŋ]**, but **[n]** is also attested.

(3.4)

[bīŋ**-s**ɛ́]	*'roll'*
[kɔ̄ŋ**-s**ɛ́]	*'awaken'*
[tʃ̄ɪŋ**-s**ɛ́]	*'send'*
[fīn**-s**ɛ́]	*'mix'*

This demonstrates that place assimilation does not apply to NC sequences resulting from suffixation. Furthermore, §2.1.4.1 provides evidence suggesting that place assimilation does not apply in cases of infixation. Thus, nasal place assimilation is limited to root internal NC sequences and those resulting from prefixation.

3.2 Front high vowel laxing

The front high vowel **/i/** consistently laxes to **[ɪ]** when preceding any NC sequence. This process occurs root-internally, as evidenced by the overall lack of **[iNC]** sequences in the language, with example (3.5) being representative.

(3.5) [fɪ̄nsɛ́] *'mix'*

Laxing is best illustrated in noun class prefixes with an underlying **/i/** and noun roots with nasal onsets, as in (3.6).

(3.6)	/kī-/+/ntâ/	→	[kɪ̄-ntâ]	*'chair' (c7)*
	/bī-/+/ɲtʃɔ̄:/	→	[bɪ̄-ɲtʃɔ̄:]	*'horns' (c8)*
	/fī-/+/ŋkɔ̄/	→	[fɪ̄-ŋkɔ̄]	*'cup' (c19)*

Laxing can sometimes be blocked when the vowel is preceded by a palatal consonant, with the laxed and nonlaxed varieties in free variation (e.g., **[tʃī-ŋgó]~[tʃɪ̄-ŋgó]** 'gun'(c13)). The nonlaxed alternative in this context is especially seen when the nasal is **ŋ**. Laxing may also occur when the nasal is an onset, particularly in fast speech, but usually it does not (e.g., **[kī-mógɛ̀]** 'maggot').

3.3 Glide formation

High vowels are realized as glides when preceding other vowels. This is seen in possessive pronouns and the anaphoric demonstrative ANA1, both of which have a vowel onset in the root. Example (3.7) illustrates glide formation observed in possessive pronouns. A high front vowel **/i/** in a prefix is realized as **[j]**, while a near-high back vowel **/o/** is realized as **[w]**. Note that the fricative vowel in the class 14 agreement prefix behaves in the same way as the non-fricative vowel in the class 18a agreement prefix.

(3.7)	/bī-/+/ɔ̄ŋ/	→	[b**j**ɔ̄ŋ]	*'2SG.POSS' (c8)*
	/fī-/+/è/	→	[f**j**ɪ̄]	*'3SG.POSS' (c19)*
	/mō-/+/è/	→	[m**w**ɪ̄]	*'3SG.POSS' (c18a)*
	/bū-/+/àŋ/	→	[b**w**âŋ]	*'1SG.POSS' (c14)*

Similarly, the high vowels of agreement prefixes on the anaphoric 1 demonstrative are realized as glides, as in (3.8). Again, the fricative vowel in the class 14 agreement prefix is realized as **[w]**, mirroring the behavior of the non-fricative vowel in the class 18a agreement prefix.

(3.8)	/tʃɪ̄-/+/ɛ̀/	→	[tʃ(**j**)ɛ̄:]	*'ANA1' (c4)*
	/kī-/+/ɛ̀/	→	[k(**j**)ɛ̄:]	*'ANA1' (c7)*
	/bī-/+/ɛ̀/	→	[b**j**ɛ̄:]	*'ANA1' (c8)*
	/mō/+/ɛ̀/	→	[m**w**ɛ̄:]	*'ANA1' (c18a)*
	/kū-/+/ɛ̀/	→	[k**w**ɛ̄:]	*'ANA1' (c3)*
	/bū/+/ɛ̀/	→	[b**w**ɛ̄:]	*'ANA1' (c14)*

As indicated by the parentheses, the palatal glide is sometimes either not present at all or is only slightly perceptible. This is particularly the case when the

preceding consonant is the palatal obstruent **/tʃ/** or the velar obstruent **/k/**. See §3.4 for an explanation of these alternative realizations, as well as of the long vowel in these forms.

3.4 Compensatory vowel lengthening

While long vowels are observed in Nchane, VV sequences involving different vowels are not allowed. This restriction is violated when the Anaphoric 1 demonstrative, which has a root consisting of the vowel **ɛ** takes a noun class agreement prefix. Therefore, one of the vowels is either deleted or is transformed into a glide (see §3.3). In either case, the result is the loss of a tone bearing unit and the development of an unassociated tone. Vowel lengthening ensues to compensate for the vowel loss and accommodate the unassociated tone.

The vowel prone to deletion (or glide formation) is the weaker of the prefix vowel and the root vowel. When the vowel of the noun class agreement prefix is relatively weak (i.e., **/i/**, **/o/** or **/u/**), the **ɛ** of the root is maintained, but lengthened, as illustrated in (3.9).

(3.9)

/jī-/+/ɛ̀/	→	[j**ɛ̂ː**]	*'ANA1' (c9)*
/wō-/+/ɛ̀/	→	[w**ɛ̂ː**]	*'ANA1' (c1)*
/bī-/+/ɛ̀/	→	[bj**ɛ̂ː**]	*'ANA1' (c8)*
/fī-/+/ɛ̀/	→	[fj**ɛ̂ː**]	*'ANA1' (c19)*
/tʃī-/+/ɛ̀/	→	[tʃ(j)**ɛ̂ː**]	*'ANA1' (c4)*
/kī-/+/ɛ̀/	→	[k(j)**ɛ̂ː**]	*'ANA1' (c7)*
/kū-/+/ɛ̀/	→	[kw**ɛ̂ː**]	*'ANA1' (c3)*
/bū-/+/ɛ̀/	→	[bw**ɛ̂ː**]	*'ANA1' (c14)*

The example set demonstrates four different realizations of this process, based on the type of consonant and prefix vowel. When the prefix consonant is a glide, the resulting word form has the shape GV:. When the prefix vowel is **/i/** and the consonant is a weak obstruent (e.g., **/b/** or **/f/**), then the prefix vowel undergoes glide formation and the root vowel is lengthened. A strong consonant followed by **/i/** results in the optional realization of a glide, which is often not heard during normal speech. Finally, when the prefix vowel is the fricative vowel, then the vowel undergoes glide formation in addition to the root vowel being lengthened.

When the prefix vowel is **/a/**, which is stronger than the root vowel **/ɛ/**, then the root vowel is deleted and the prefix vowel is lengthened to compensate.

(3.10)

/bā-/+/ɛ̀/	→	[b**â:**]	*'ANA1' (c2)*
/kā-/+/ɛ̀/	→	[k**â:**]	*'ANA1' (c6)*
/mā-/+/ɛ̀/	→	[m**â:**]	*'ANA1' (c6a)*
/jā-/+/ɛ̀/	→	[j**â:**]	*'ANA1' (c18)*

3.5 Vowel copying

The phenomenon of vowel copying is observed in a limited number of contexts, each involving the copying of a prefix vowel, and insertion of the copied vowel into the stem. Two contexts involve the copying of a prefix **/a/**, the first of which is the distal demonstrative **gɛ̄** illustrated in (3.11). The **/a/** of the prefixes for classes 2, 6, 6a and 18 is copied and the vowel of the demonstrative root is deleted.

(3.11)	/bā-/+/gɛ̄/	→	[bà-g**a̰**]	*'those' (c2)*
	/kā-/+/gɛ̄/	→	[kà-g**a̰**]	*'those' (c6)*
	/mā-/+/gɛ̄/	→	[mà-g**a̰**]	*'that' (c6a)*
	/jā-/+/gɛ̄/	→	[jà-g**a̰**]	*'that' (c18)*

Note that the agreement prefixes for the other classes do not trigger vowel copying, with the vowel of the demonstrative remaining unaltered (e.g., **[wù-gī]** 'that' (c1) and **[bī-gī]** 'those' (c8)).

The second case involves the numbers 'two', 'three' and 'four' when they are marked with class 6 agreement. The vowel **/ɛ/** in each of the numbers is replaced with **/a/**, which is a copy of the agreement prefix for class 6.[26]

(3.12)	/ā-/+/fɛ́:/	→	[ā-f**á:**]	*'two' (c6)*
	/ā-/+/tɛ̄dɛ̄/	→	[ā-t**ā**dī]	*'three' (c6)*
	/ā-/+/nɛ̄/	→	[ā-n**a̰**]	*'four' (c6)*

This phenomenon could be a phonological one, since words with the sequences **age** and **agɛ** are very rare. The word **[ā-gī]** 'sole of foot'(c17) is one example. An alternation showing the same kind of process is seen with the word for stone (gender 5/6). The singular form is **[Ø-tɛ̄dī]** and the plural form is **[ā-tā]**. However, another gender 5/6 word 'axe' does not show the alternation (**[Ø-tɛ̄mɛ̄]** and **[ā-tɛ̄mɛ̄]**).

An alternative analysis of this phenomenon is to treat it as vowel assimilation. So instead of copying the first vowel, inserting it into the root and then deleting the second vowel, the second vowel assimilates properties of the first vowel. However, as will be seen in the next case involving the number 'one', it is apparent that two vowel elements are realized in the final syllable of the root, supporting the copying-insertion analysis.

Vowel copying is also observed in the root of the number 'one' when taking an agreement prefix with a high vowel (including the near-high back vowel).[27] When

[26] The underlying forms of the numbers are based on the surface realizations of the numbers in citation form with no nominal head.

[27] As with the numbers 'two' through 'four' in the previous case, the underlying form of the number 'one' is based on its surface realization in citation form and with no nominal head.

the agreement prefix has the high front vowel **/i/**, this vowel is copied and the **/e/** of the number is deleted. When the prefix has the high back vowel **/u/** or the near-high back vowel **/o/**, the vowel is copied and the **/e/** of the number is deleted. Both of these cases are illustrated in (3.13). Note that the copied vowel is also inserted into the second syllable of the root. However, in this case, the **/a/** of the root is maintained, and the copied vowel then undergoes glide formation (see §3.3 for an account of glide formation).

(3.13)	/tʃĩ-/+/mēmà/	→	[tʃĩ-mīm**j**à]	*'one' (c5)*
	/kī-/+/mēmà/	→	[kī-mīm**j**à]	*'one' (c7)*
	/jī-/+/mēmà/	→	[jī-mīm**j**à]	*'one' (c9)*
	/fī-/+/mēmà/	→	[fī-mīm**j**à]	*'one' (c19)*
	/wō-/+/mēmà/	→	[wō-mō̰m**w**à]	*'one' (c1)*
	/wō-/+/mēmà/	→	[wō-mō̰m**w**à]	*'one' (c3)*
	/bū-/+/mēmà/	→	[bvū-mō̰m**w**à]	*'one' (c14)*

A similar process is observed when the class 10 agreement marker **/jī-/** is prefixed to roots of the numbers two, three, four and five. The high front vowel of the agreement prefix is copied and inserted to the right of the initial consonant of the number root, as illustrated in (3.14). The root vowels are maintained, and as in the case of vowel copying involving the number one presented above, the copied vowel undergoes glide formation. Note that this process is not triggered in the case of class 4 agreement, even though the class 4 agreement marker for numbers is the same as that for class 10.

(3.14)	/jī-/+/fɛ́:/	→	[jī-**fj**ɛ́:]	*'two' (c10)*
	/jī-/+/tɛ̄dɛ̄/	→	[jī-**ʃ**ɛ̄dī]	*'three' (c10)*
	/jī-/+/nɛ̀/	→	[jī-**nj**ɛ̀]	*'four' (c10)*
	/jī-/+/tɛ̀ŋ/	→	[jī-**ʃ**ə̀ŋ]	*'five' (c10)*

In the case of roots with a **/t/** onset, the copied high front vowel results in spirantization of the **/t/**, which is discussed in the next section.

3.6 Spirantization

The process of an obstruent becoming a fricative is referred to as spirantization. This is observed in Nchane in a small number of contexts, sometimes in association with the copying and insertion of a high front vowel (described in §3.5 above). Spirantization occurs to a small degree with the consonants **k** and **g** in monomorphemic contexts, particularly when intervening between identical non-high vowels. For example, **/sákā/** 'news' is sometimes pronounced as **[sáxā]**, although the frication is usually not very strong.

As was stated in §2.1.2, **d** before **i** is probably usually spirantized. Thus, for example, **/dī/** 'name' is realized as **[dʒī]**. Also, the palatal glide **y** is often spirantized

when not preceded by another consonant, with free variation of the two different realizations. This is especially the case when word-initial. For example, **[jō]~[jō]** 'hair', **[jɛ̄ŋ]~[jɛ̄ŋ]** 'see' and **[jə́]~[jə́]** 'suck'.

Morphophonemic occurrences of spirantization are also attested. The root-initial consonants **d** and **s** of class 3 nouns are realized as fricatives, presumably conditioned by the class 3 infix **-w-**. Example (3.15) gives derivations to demonstrate the process.

(3.15)	/-w-/+/dɛ̄/	→	dwɛ̄	→	[**dʒ**wɛ̄]	*'mouth'*
	/-w-/+/ɲsɛ̰̄/	→	ɲswɛ̰̄	→	[ɲ**ʃ**wɛ̰̄]	*'palm needle'*

While clear examples of class 3 nouns with a **tw** onset are unattested, the fact that class 3 spirantization is not realized with non-alveolar initial consonants implies that the feature +alveolar conditions the process (at least as it is realized with class 3 nouns). The mid front vowel could likewise be a necessary element, since **ɛ** follows the **Cw** sequence in both of the above words.

The previous section also showed that spirantization follows the insertion of a high front vowel to the right of the root-initial **t** of the numbers three and five, when marked with class 10 agreement. This is illustrated by the derivations in example (3.16).

(3.16)	/jī-/+/tɛ̄dɛ̄/	→	jī-tjɛ̄dī	→	[jī-**ʃ**ɛ̄dī]	*'three' (c10)*
	/jī-/+/tɛ̀ŋ/	→	jī-tjɛ̀ŋ	→	[jī-**ʃ**ə̀ŋ]	*'five' (c10)*