A grammar of Nchane: A Bantoid (Beboid) language of Cameroon
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Chapter 4

Tone

Nchane is a tonal language with a tonal system comprising three level tones and several contour tones. This distinguishes it from the two-tone systems commonly associated with Narrow Bantu languages, although many Bantoid languages of the area also report more than two level tones (cf. Mundabli (Voll 2017), Mungbam (Lovegren 2013), Noni (Hyman 1981), and Limbum (Fransen 1995)). Tone functions in marking lexical items as well as in making some grammatical distinctions. Nouns display the largest variety of tones. Therefore, the analysis here gives more attention to nominal tone as compared to other word classes. Some differences in behavior between nominal and verbal tone are observed and will be pointed out below.

The tone inventory, including a lengthy proofing exercise, is given in §4.1 followed by a description of the functions of tone in §4.2. Section 4.3 presents how the various tones are distributed and their general phonetic characteristics are discussed in §4.4. The nouns of gender 9/10 are differentiated by tone only and display tonal behavior that is not clearly understood. Therefore, the tone of these nouns is given special attention in §4.5. Finally, §4.6 is devoted to describing tone processes which have been identified.

An overview of the different representative elements of tone used in this chapter are given in Table 4.1.

Tone letters	Diacritic	Interpretation
H	ɛ́	high
M	ɛ̄	mid
L	ɛ̀	low
SH	ɛ̋	super high
SL	ɛ̏	super low
HM	ɛ̂	high-mid fall
HL	ɛ̂	high-low fall
ML	ɛ̃	mid-low fall
MH	ɛ̌	low-high rise

Table 4.1 Summary of tone orthography.

4.1   Tone inventory

Vowels serve as tone-bearing units, with the roots of word forms characterized by single or multiple tones forming tone melodies. The behavior of the various tone melodies as observed in tone frames indicates that Nchane has three contrastive level tones: High (H), Mid (M) and Low (L). Three falling contour tones are attested, while MH is the only rising contour tone observed.

Richards (1991) attests to three level tones (H, M, L) and five contour tones (HM, HL, ML, LM and LH) on monosyllabic words for Nchane. The current analysis differs in that the LM melody does not appear in this data. The LM examples offered by Richards are all class 9 nouns which are interpreted as M in this work. Additionally, I treat Richard's LH melody as MH, although it often behaves as LH with the M being slightly lowered and triggering downdrift in the appropriate contexts. It should be noted that class 9 nouns present some challenges to identifying underlying tones. This is discussed further in §4.5.

The seven phonemic tone melodies are summarized in Table 4.2, where they are illustrated by nouns with no segmental prefix.[28] A reduced tone inventory is observed in verbs, which is briefly discussed at the end of this section.

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[28] While these nouns have no segmental prefix, a floating L is hypothesized as associated with the class 1 prefix position. However, any possible effect of this floating L is imperceptible in isolation utterances.

Tone melody	Example	Gloss
H	Ø-lú	*'marriage' (c5)*
M	Ø-ñsū	*'pepper' (c1)*
L	Ø-ŋkù	*'box' (c1)*
HM	Ø-mṵ́	*'razor' (c5)*
HL	m̄f-û	*'stirring stick' (c3)*
ML	Ø-mṵ̄	*'person' (c1)*
MH	Ø-ŋgūlú	*'vulture' (c1)*

Table 4.2 Phonemic Nchane tone melodies illustrated on noun roots in isolation form.

Super high (SH) and super low (SL) tones are also observed in the data. However, their occurrence is usually attributable to specific tonal or grammatical contexts and are not considered to be phonemic (see §§4.6.4 and 4.6.5 for an account of SL and SH respectively). As stated in §2.1.5.1, the nasals of NC sequences do not have their own lexical tone, but derive their tone from the preceding tonal context or take an apparent default M tone. When a floating L tone is available, the L tone is usually realized on the nasal rather than the default M tone. However, these nasals are often resyllabified when preceded by an open syllable morpheme. When this is the case, as it is for many of the examples in this chapter, this explains why they are not marked with surface tone.

For the purpose of illustrating the phonemic nature of the seven tone melodies given in Table 4.2, disyllabic class 1 nouns in different tone frames are presented below. Class 1 nouns are chosen for the demonstration because all seven melodies may be accounted for. Finding suitable frames for studying the various tones is challenging, since no single noun class displays tonal patterns in which surface tone is easily mapped to the underlying tone. Furthermore, at times, multiple frames need to be examined in order for distinct tonal patterns to be observed. Therefore, the following exercise should be viewed as a process in which the individual "proofs" at times depend on previous "proofs", with the sets of data eventually accumulating to elaborate the full system. Where appropriate, the reader is directed to other sections for the finer details of associated processes.

The demonstration begins by showing the tonal behavior of class 1 nouns with different underlying tones in H tone frames. The H frames consist of a conjoined noun phrase with the class 10 noun ʃí 'chickens' and the conjunction/preposition bɛ́ 'with'. The data sets are presented with a header and three lines. The header provides the underlying tone of the noun under investigation. The first line gives the frames, with 'x and chickens' on the left and 'chickens and x' on the right. The tone diacritics on the examples represent surface tone. The second line gives the underlying tone. The third line gives the glosses. The various melodies are presented in the same order as in Table 4.2, with the exception of the HM melody, for which the tonal behavior is odd. Consequently, it will be treated after the other melodies.

Examples (4.1)-(4.3) show that there are no tonal changes associated with the level tone melodies in a H tone frame, except for downstepping of the H in example (4.1). (See §4.6.2 for a description of this process.) Otherwise, the H's are realized as H's, the M's are realized as M's and the L's are realized as L's. The downstepped H in (4.1) results in a loss of contrast between H and M, but contrast is evident when the word in focus is in the initial position of the frame, establishing phonemic H and M melodies. These frames also provide evidence that is supportive of phonemic M and L melodies, although the pitch difference between the M and L nouns in the frames could be generalized for both nouns as simply lower relative to the H noun in the same frames. More definitive evidence for phonemic M and L melodies is found in a L tone frame, which is given later in this section.

(4.1)   H
        Ø-kfúlá   bɛ́   ʃǐ   ʃǐ   bɛ́   **Ø-⁺kfúlá**
        ^{L}- H   H ^{H}H ^{H}H   H ^{L}- HH
        c1-hyena   with   c10.chicken   c10.chicken with c1-hyena

(4.2)   M
        Ø-m̄bēgɛ̄   bɛ́   ʃǐ   ʃǐ   bɛ́   **Ø-mbēgɛ̄**
        ^{L}- M   H ^{H}H ^{H}H   H ^{L}- MM
        c1-hill   with   c10.chicken   c10.chicken with c1-hill

(4.3)   L
        Ø-ǹsàlà   bɛ́   ʃǐ   ʃǐ   bɛ́   **Ø-nsàlà**
        ^{L}- L   H ^{H}H ^{H}H   H ^{L}- L
        c1-needle   with   c10.chicken   c10.chicken with c1-needle

The HL melody illustrated in (4.4) also presents no difficulties for analysis, with no changes of the melody itself, but downdrift is observed when a HLH sequence occurs, as in the "lion and chickens" phrase. (See §4.6.1 for an account of this phenomenon.)

(4.4)   HL
        Ø-bvúlè   ⁺bɛ́   ʃǐ   ʃǐ   bɛ́   **Ø-bvúlè**
        ^{L}- HL   H ^{H}H ^{H}H   H ^{L}- HL
        c1-lion   with   c10.chicken   c10.chicken with c1-lion

ML roots in utterance-final position are realized with a falling tone. Thus, for example, **nā̀** 'cow' and **m̄būnà** 'sweet potato' are both realizations of the ML melody. The fall of the contour is usually unrealized when in non utterance-final position or when preceded by a H tone. When there is no fall, as seen in (4.5), the contrast between L and ML is neutralized (cf. example (4.3)). However, evidence for a ML melody is provided in a L frame, which will be given later in this section. Note

that the class 1 ML noun in the example is realized with a phonetic L tone. This phenomenon is explained in §4.6.3.

(4.5) <u>ML</u>

Ø-ŋ̀gvùlè	bɛ́	ʃĭ		ʃĭ	bɛ́	**Ø-ŋgvùlè**
ᴸ- ML	H	ᴴH		ᴴH	H	ᴸ- ML
c1-worm	with	c10.chicken		c10.chicken	with	c1-worm

As seen in (4.6), MH is realized as MH, with the H being pronounced at a lower pitch due to downdrift when the MH sequence is preceded by an additional H (see §4.6.1). While the M lowering observed above in the ML root appears to be blocked by the following H, downdrift nevertheless occurs and it is likely that the M of both H frames is slightly lowered as described in §4.4.

(4.6) <u>MH</u>

Ø-m̄bvūʃá	bɛ́	ʃĭ		ʃĭ	bɛ́	**Ø-mbvū⁺ʃá**
ᴸ- MH	H	ᴴH		ᴴH	H	ᴸ- MH
c1-cat	with	c10.chicken		c10.chicken	with	c1-cat

The H frames clearly establish H, HL and MH melodies. As stated earlier, there appears to be a M melody, which is realized at a higher pitch level than the L melody. However, contrast between these melodies is better established in a L frame, which is presented below.

The L frame used in the analysis places the nouns in the first position of the associative noun phrase 'x of goat'. This presentation is limited to c1 nouns; therefore, the associative marker is a constant and has a L tone. The word for 'goat' is **bi** (ᴸM) and belongs to class 9. It has a floating L in the prefix position and a M on the root. The tone on 'goat' is realized as either M or L depending on the tonal context.

Examples (4.7), (4.8) and (4.9) illustrate H, M and L nouns respectively. Two distinct patterns may be observed. First, the associative markers of the H and M nouns are realized at the same pitch level as 'goat', and the H and M nouns are realized with a tone higher than that of the associative marker. Second, the L noun and its associative marker are both realized at the same pitch level, which is lower than that of 'goat'. The behavior of the tone on 'goat' is explained in §§4.6.3 and 4.6.4. The important observation for the purposes of this proofing exercise is that a contrast is established for the L and non-L melodies.

(4.7)   H
         Ø-kfúlá   wù   bì
         ᴸ- H   L   ᴸM
         c1-hyena   c1AM   c9.goat

(4.8)   M
         Ø-m̀bēgɛ̄   wù   bì
         ᴸ- M   L   ᴸM
         c1-hill   c1AM   c9.goat

(4.9)   L
         Ø-ǹsàlà   wù   bī
         ᴸ- L   L   ᴸM
         c1-needle   c1AM   c9.goat

Examples (4.10), (4.11) and (4.12) each illustrate melodies on the noun involving a L as part of a contour tone melody. In each case, the associative marker is realized at a pitch level which is lower than the following noun 'goat'. (Again, there is no contrast between the L and ML melodies in this frame. But contrast is observed in examples (4.13) and (4.14) below, where the order of the L frame is reversed.)

(4.10)   HL
         Ø-bvúlè   wù   bī
         ᴸ- HL   L   ᴸM
         c1-lion   c1AM   c9.goat

(4.11)   ML
         Ø-ŋ̀gvùlè   wù   bī
         ᴸ- ML   L   ᴸM
         c1-worm   c1AM   c9.goat

The rising MH tone in (4.12) shows that there are no changes of the tone on the noun associated with the tone frame. (As observed in example (4.6) above, the M lowering rule is blocked because of the H following the floating L-M sequence.)

(4.12)   MH
         Ø-m̄bvūʃá   wù   bī
         ᴸ- MH   L   ᴸM
         c1-cat   c1AM   c9.goat

Up to this point, the H and L frames have not established a contrast between the L and ML melodies, with identical surface realizations of both. A second L frame, consisting of an associative noun phrase with the noun in question in the N₂ position, demonstrates the phonemic status of the two melodies. Example (4.13) shows a L noun, which is realized with a falling L on the final syllable. The final "a" is placed in parentheses to indicate nonphonemic vowel length (only slightly longer than a vowel of normal length), which allows for the realization of the falling L on a single syllable. The ML noun in example (4.14) shows a L.SL pattern and indicates an earlier commencement of the falling L. Thus, the difference between these two melodies is the point at which the fall from L to SL begins.

(4.13)   <u>L</u>
Ø-kfù   wù   **Ø-nsàlà(à)**
ᴸ- ML   L   ᴸ- L
c1-rope   c1AM   c1-needle

(4.14)   <u>ML</u>
Ø-kfù   wù   **Ø-ŋgvùlè̀**
ᴸ- ML   L   ᴸ- ML
c1-rope   c1AM   c1-worm

Again, the purpose of this section is not to describe the various tonological processes of the language, but rather to establish phonemic contrasts. The reader is directed to §4.6.4 for an explanation of the processes motivating the falling L and L.SL patterns in these examples.

As mentioned above, the HM melody presents some peculiarities which have not yet been accounted for. There are only two class 1 nouns in the data representing this melody, one monosyllabic (**ŋ̀kū** 'scabbard') and one disyllabic (**ɲ̀tʃɔ:ŋɛ́** 'praying mantis'). In utterance-final position, the nouns are realized with a HM fall realized on the final syllable. The same pattern is observed in the H frame presented in example (4.15). When the word is not utterance-final, then the tone on the final syllable is realized as a downstepped H rather than as a falling tone.

(4.15)   <u>HM</u>
Ø-ɲ̀tʃɔ:ᐟŋɛ́   bɛ́   ʃĭ   │   ʃĭ   bɛ́   Ø-ɲtʃɔ́:ŋɛ̂
ᴸ- HM   H   ᴴH   │   ᴴH   H   ᴸ- HM
c1-praying.   with   c10.chicken │ c10.chicken   with   c1-praying.
mantis   │   mantis

Note that certain other noun classes have numerous members with a HM melody, but the tones are realized as level tones on disyllabic forms (e.g., **tʃī-lélē** 'dragonflies'(c13)). Nevertheless, in each case, downstepping is observed in the H

frame "X and chickens". For example, the class 5 noun **gɛ́nɛ̄** 'egg' is realized as **gɛ́⁺nɛ́ bɛ́ ʃí** ('egg and chickens').

There is no apparent downstep in the HM melody when placed in a L frame, as demonstrated in (4.16). Both syllables of the noun root are realized with a H tone, presenting the same pattern as that of the H melody presented in example (4.7). One possible analysis is that there is a floating L tone (e.g., ^{L}-H^{L}H), with an accompanying rule dictating when downstep is triggered.

(4.16)   <u>HM</u>
         Ø-ǹtʃɔ́ŋɛ́   wù   bì
         ^{L}- HM   L ^{L}M
         c1-praying.mantis   c1AM   c9.goat

Although the HM melody is not completely understood, it is clear that it represents a separate phonemic melody type.

Verbs display only four phonemic tone melodies, which are summarized in Table 4.3, illustrated by bare verbs.

Tone	Example	Gloss
H	bíŋ	*'dance'*
M	bē	*'cry'*
L	bì	*'follow'*
ML	tʃīnɛ̀	*'abandon'*

Table 4.3 Attested Nchane tones in verbs (non-Progressive form).

The tones of M and L verbs are realized as falling when utterance final. All verbs from the M group in the corpus are monosyllabic. The difference between M and ML verbs is neutralized in utterance final position. Therefore, it is possible that these two melodies represent the same underlying melody when realized on verbs.

4.2   Functions of tone

As mentioned in the introduction, Nchane tone functions in marking lexical items and in making grammatical distinctions. Distinctions by tone only are not overly common, such that the practical orthography utilizes minimal tone marking (rather than exhaustive marking) for the purpose of disambiguating lexical items for which clausal context is insufficient (see Boutwell & Boutwell 2008). Lexical tone may differentiate items of the same word class, as in (4.17), or of different word classes, as in 0.

(4.17) ŋgɔ̄   *'termite' (c9)*   ŋgɔ̀   *'grinding stone' (c1)*
        kfū̃   *'rope' (c1)*   kfṹ   *'family' (c5)*

(4.18) kɔ́mɛ̀   *'harp' (c5)*   kɔ́mɛ́   *'scratch) (v.)*
        dʒī̄   *'hoe' (c9)*   dʒí   *'eat' (v.)*

While lexical tone represents an essential element of a lexical item, grammatical tone serves to indicate some kind of grammatical meaning. For example, grammatical tone distinguishes gender 9/10 nouns, expressing number. This distinction is thought to be accomplished through the presence of floating tones, L for class 9 and H for class 10. These grammatical tones are realized as a relative tonal difference, with class 9 nouns having a lower tone and c10 nouns having a higher tone. See §4.5 for a description of the tone of this gender.

(4.19) ɲàŋ   *'animal' (c9)*   ɲā̃ŋ   *'animals' (c10)*
        bjɛ̀ŋ   *'fish' (c9)*   bjɛ́ŋ   *'fish' (c10)*

Grammatical tone is also observed in the TAM system. Example (4.20) consists of a clausal minimal pair which illustrates a grammatical H tone indicating Hortative mood. In the first clause, which is in Indicative mood and immediate past tense, the subject pronoun is realized with a M tone. In the second clause, the subject pronoun is realized with a H tone, expressing a desire or softened command.

(4.20) wɔ̄   fɔ̄:sɛ̄   bī-gē   *'You borrowed money.' (just now)*
        2SG   borrow   c8-teeth

        wɔ́   fɔ̄:sɛ̄   bī-gē   *'You should borrow money.'*
        2SG.HORT   borrow   c8-teeth

4.3   Tone distribution patterning

The distribution of the various tone melodies as realized on nouns is given in Table 4.4.[29] The prevalence of each tone melody is given, as well as their occurrence on monosyllabic versus disyllabic noun roots.

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[29] This inventory excludes nouns of gender 9/10, since these nouns have underlying tone that is often difficult to discern because of the assumed interaction between the hypothesized floating tone prefixes and noun root tone, in addition to probable nasal depression.

Tone	Tokens	% of Total	% monosyl	% disyl
H	72	14%	10%	5%
M	90	18%	13%	4%
L	52	10%	10%	0%
HM	54	11%	7%	4%
HL	78	15%	5%	11%
ML	90	18%	11%	7%
MH	26	5%	0%	5%
unassigned	43	9%	5%	4%
Total	**505**	**100%**	**61%**	**39%**

Table 4.4 Distribution patterns of nominal tone (gender 9/10 nouns excluded).

The shaded boxes in the table indicate distribution peculiarities. First, L nouns are limited to those with monosyllabic roots. This melody is further restricted to certain noun classes: 1, 2, 7, 8, 9, 10, 19, 18a. Furthermore, nouns having NC sequences at the prefix-stem boundary are the majority of the L noun group (44 of 52 nouns or 85%). This apparent relationship between L tone and NC sequences has been observed particularly in the Eastern Grassfields languages (see Akumbu & Hyman 2017; and Hyman 1980). See §4.4 for details regarding the phonetic realization of tone as related to these NC sequences.

Second, MH nouns are limited to those with disyllabic roots. As it is the only rising melody observed in the data, it suggests that a single tone bearing unit cannot support rising melodies. And so, when disyllabic nouns with a rising melody are reduced to a single syllable, the rising melody is presumably changed into a melody that is acceptable to a single tone bearing unit.

The unassigned forms represent eight different noun classes, approximately half being gender 7/8 nouns. Some of these forms appear to present an interaction between prefix and root tones, with the prefix tone different than expected. Therefore, in those cases, the unassigned nouns might reflect a subclass marked by a different class prefix from the prevailing one. About one quarter of unassigned forms belong to class 6, with some of these involving a suppletive stem (discussed in §5.2.1). Perhaps the difficulty with assignment in this case has to do with an unstable tone environment reflecting this suppletion. Ultimately, the tonal behavior of these unassigned forms does not clearly follow the observed patterns associated with any of the seven identified tone groups and are therefore, left unassigned.

The distribution of tone on verbs constitutes close to a three-way split when the M and ML groups are combined: H=31%, M and ML=42%, L=28%. The slight predominance of the combined M and ML groups is consistent with what is seen in noun tone distribution patterns summarized in Table 4.4.

4.4 Phonetic realization of tone

The actual pitch realization of tone varies greatly depending on a number of factors, including intonational effects and speaker age and gender. However, the differences in pitch between the various tones are generally consistent. As a point of reference, Table 4.5 gives the approximate pitch measurements of the tones as realized by a male speaker aged 30-40 years.

Tone	Pitch (Hz)
H	155
M	140
L	125
HM	155.130
HL	155.115
ML	125.105
MH	140.155

Table 4.5 Approximate pitch realizations of tone for a male speaker aged 30-40 years.

Downstepped high tones (⁺H) usually measure about 10-15 Hz lower in pitch compared to the normal H, similar if not identical to the pitch realization of a normal M. Super low tones (SL) are usually lower than a normal L by about 10 Hz. Super high tones (SH) are usually higher than a normal H by about 10 Hz, although the difference can be as high as 30 Hz in some instances.

Declination, or the gradual reduction in pitch over the course of an utterance (see Snider & van der Hulst 2012: 8), is modest in its realization and most apparent in long utterances. For example, in the sentence

Lɛ̄ kwɛ̄sé wɛ̂: dú nɔ̄, mɛ̄ mɔ̄ gɛ̂: mɛ̄ n̄-jɔ̀ ǹchē yī bā yúyí bīkfūnè yú mɛ̄ ŋgɛ̂: à màŋ-kàlà mā-ā lé.

'As that woman said so, I went and brought medicine that kills rats and put it in
that cassava puff.'   What-goes-around.9.14

the beginning and ending H tones represent a decline of about 45 Hz, with the initial H tone at 181 Hz and the final H tone at 136 Hz.

As mentioned above, nouns with NC sequences at the prefix-stem boundary appear to have some association with a L tone. In fact, a M-toned class prefix of such a noun is often slightly lowered, as illustrated in (4.21), which compares classes 2 and 7. In isolation, no lowering is evident in the H forms in (4.21)a.[30] In the M forms in (4.21)b, the class 2 prefix is lowered slightly (indicated by the superscript 0), while

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[30] Lowering in the H forms might actually occur, but be imperceptible due to the relatively small difference between a standard M and a lowered M relative to the H.

no lowering is observed of the class 7 prefix. Lowering is observed in both L nouns, as demonstrated in (4.21)c.

(4.21)   a.   bā-ndáŋ   kī-já
              M-   H   M- H
              c2-thread   c7-ram

         b.   bāᵒ-ɱfā   kī-bḗŋ
              M-   M   M- M
              c2a-eagle   c7-calabash

         c.   bāᵒ-ɲdʒà   kīᵒ-mbàŋ
              M-   L   M- L
              c2-balafon   c7-walking.stick

        While the lowering of the prefixes of the M nouns is only slight for class 2 and not apparent at all for class 7, the tone associated with them nevertheless behaves as a L in tonological processes such as downdrift (described in §4.6.1). This is true even for the H nouns, where no lowering of the prefix M is perceived for either class. It should also be noted that the same tonal behavior (seemingly associated with the prefix nasal here) is observed in the few class 2 nouns which do not have a nasal onset, just as is seen with the class 7 example in (4.21)b. Indeed, the same kind of lowering phenomenon is observed in class 9 nouns, where the number of roots with a nasal onset is only about 25%. Thus, a case can be made for the diachronic existence of so-called "nasal classes", some of which synchronically have no nasal (see Akumbu & Hyman 2017; Good & Lovegren 2017; and Hyman 1980).

        A final observation to be made regarding the phonetics of tone involves vowel length. There is a tendency for contour tones to be associated with long vowels or so-called "half" long vowels. This length is likely a byproduct of syllable reduction, as suggested in §2.2.5.

4.5   Tone of gender 9/10 nouns

The singular/plural distinction of gender 9/10 nouns is indicated by tone alone. Generally, class 9 nouns have a relatively low tone, while class 10 nouns have a relatively high tone. The class markings consist of floating tone prefixes in both classes, a floating L for class 9 and a floating H for class 10. However, a workable analysis for these tone markers has been elusive. (The class 9 prefix could be a floating M that behaves like a L, as was described in the previous section.) Table 4.6 provides examples of gender 9/10 nouns with different tonal patterns and an initial hypothesis regarding their underlying tones. Note that the tone of class 9 ML nouns usually surfaces as a LSL fall in isolation.

Underlying tone	Surface tone		Gloss
	Class 9	**Class 10**	
H	dʒɔ́ŋ	dʒɔ́ŋ	*'star'*
M	bī	bī	*'goat'*
L	dʒì	dʒī̀	*'hoe'*
ML	dʒvù̏	dʒvū	*'cobra'*
MH	bvṳ̄	bvṳ́	*'dog'*

Table 4.6 Different tonal groups for gender 9/10 nouns (in isolation) with proposed underlying tone group assignment.

In some cases, for example nouns in the H and M groups, the tonal difference between singular and plural forms is difficult for the non-native speaker to perceive, and is possibly neutralized in certain contexts. However, the different underlying tones may be observed in tone frames which place the nouns in contrasting tonal environments. For example, the realizations of the class 9 and class 10 forms of the H noun **dʒɔ́ŋ** 'star' in the H frame 'chickens of X' are **[shí bɛ́ dʒɔ̄ŋ]** and **[shí bɛ́ dʒɔ́ŋ]** respectively, with the H of the class 9 noun presumably downstepped. Likewise, the underlying differences between singular and plural forms of the M noun **bī** 'goat' are seen in the same frame: **[shí bɛ́ bì]** and **[shí bɛ́ bī]**. Native speakers are clearly aware of the L-H grammatical distinction, even when the tones of a singular-plural pairing are realized at the same level. This sometimes results in the speaker pronouncing the plural noun with an extraordinarily high tone in order to make disambiguation certain.

As mentioned above, an analysis of the underlying tones and their behaviors has not been successfully obtained. It is possible that a contributing factor is nasal depression, which is briefly discussed in §4.4. Only about 25% of gender 9/10 nouns have an NC onset. However, nasal prefixes are observed for this gender in a number of nearby languages and are posited for the reconstructed Proto-Eastern Grassfields, representing languages located south and east from Nchane (Hyman 1980: 182).

4.6 Tonal processes

Several tonological processes are observed in Nchane, resulting in different tonal realizations. Some of these processes are challenging to identify and understand due to the apparent interaction between tone and root-initial nasals as described in §4.4. An additional complication is the occasional variability of tone in utterances experienced in the elicitation process. In some cases, the same phrase can be uttered by the same speaker with two different tonal patterns one after the other. Nevertheless, this section endeavors to describe some of the details of tonal behavior.

The various tone processes described in this section are summarized in Table 4.7. The first three processes, which are grouped together in the table by a dashed line, are those which apply broadly and without phrase position conditions, although rule 3 may not occur after rule 4. To avoid confusion over the terms *downdrift* and

downstep, they are defined here as the lowering of the tonal register due to the presence of a surface L (for *downdrift*), or a floating L (for *downstep*) (see Snider & van der Hulst 2012 for a full treatment of these processes).

The next five processes are those which occur at a phrase boundary. Generally, they may be considered as involving ordered rules (particularly processes 4-7). The "stray erasure" process is proposed out of necessity. It is not illustrated by examples as the other processes are, but is apparent as an intervening process in deriving the proper environment for L lowering. The final process, H raising, primarily involves the realization of grammatical tone.

Process	Rule	Description
1. Downdrift	HLH→HL$^{\downarrow}$H	second H of HLH sequence lowers tonal register
2. Downstep	H$^{\text{L}}$H→H$^{\downarrow}$H	second H of HH sequence with certain intervening floating L's lowers tonal register
3. M lowering	$^{\text{L}}$M→L$^{\text{M}}$	M preceded by floating L is realized as L and floating M
4. Floating M re-association	LLL$^{\text{M}}$]→LL$^{\text{L}}$M	phrase-final floating M takes place of preceding L when preceded by three or more L's
5. Stray erasure	$^{\text{M}}$→0	floating M is deleted
6. L lowering	LLL]→LLSL LHL]→LHSL	phrase-final L lowered to SL when preceded by two or more other L's or a LH sequence
7. Partial M lowering	HMM]→HMM$^{\text{o}}$	phrase-final M is slightly lowered when preceded by sequence of H(M)M
8. M raising	LM(M)M]H→LM(M)H]H	phrase-final M preceded by L M (M) and followed by H is realized as H
9. H raising	H=H→SH	lexical H cliticized by grammatical H realized as SH

Table 4.7 Summary of Nchane tone processes.

In addition to the tone letters and diacritics given in Table 4.1, this section makes use of the following symbols: $^{\text{H}}$ (floating H tone), $^{\text{L}}$ (floating L tone), ɛ̄$^{\text{o}}$ (partially lowered M tone), $^{\downarrow}$ (lowered register due to downdrift or downstep),] (right phrase boundary).

4.6.1   Downdrift

Downdrift (also known as automatic downstep) occurs in HLH and certain HMH sequences, with the second H being lowered and ensuing tones likewise lowered, as is illustrated in (4.22). Its presence in Nchane is particularly notable since the process

is distinctly observed as absent in the neighboring languages Noni and Mundabli (Hyman 1981: 6; and Voll 2017: 15 respectively).

(4.22)　Ø-lábè　⁺bɛ́　ʃɪ̌
　　　　　H L　　H　　ᴴ. H
　　　　　c5-web　with　c10.chicken

'web and chickens'

Example (4.23) shows that downdrift occurs multiple times within a single phrase when multiple HLH sequences are present.

(4.23)　Ø-ŋgáŋ　　wù　　Ø-⁺tʃɔ́ŋ　wù　　Ø-⁺lú
　　　　　H　　　　L　　　H　　　L　　　H
　　　　　c1-scorpion　c1ᴀᴍ　c1-thief　c1ᴀᴍ　c5-marriage

'scorpion of thief of marriage'

This final example illustrates downdrift involving constituents other than noun phrases, with the register lowering on the postverbal adverb **bá:ŋ**.

(4.24)　fɪ̄　　ɣá　　wù　　⁺bá:ŋ
　　　　　M　　H　　L　　H
　　　　　c19　surpass　3 sɢ　much
　　　　　*'...he was very surprised...' (*lit. *it surpassed him much)*
　　　　　　　　　　　　　　　　　　　　　　Jealous Husband.15

As mentioned above, certain HMH sequences can result in downdrift. In these cases, the apparent surface M behaves like a L. The M's characterized by this behavior are those associated with the nasal classes as stated in §4.4. This behavior is demonstrated in example (4.25) with a class 2 H noun. Note that, while this noun root does not have a nasal onset, it patterns with other class 2 nouns which do (as stated in §4.4), indicating that class 2 should be designated as a nasal class in spite of having members lacking the segmental nasal. The downdrift in this example is comparable to that seen in the class 1 form of the same noun, which has the underlying form ᴸ-**kfúlá**. The analysis of the class 2 prefix as M rather than L is supported by evidence from the L frames, as well as numerous occurrences in the text data.

(4.25)　ʃɪ̌　　　　　bɛ́　　bā-⁺kfúlá
　　　　　ᴴH　　　　H　　M- H
　　　　　c10.chicken　with　c2-hyena

Example (4.26) illustrates that this same phenomenon occurs with class 7 nouns as well. The M of the c7 prefix causes the H root of 'fool' to downstep. This is

followed by a second HMH sequence resulting in the H of 'marriage' to be downstepped.

(4.26)   ʃĭ   bɛ́   kī-⁺júŋ   kī   Ø-⁺lú
          ᴴ.H   H   M- H   M   H
          c10.chicken   with   c7-fool   c7ᴀᴍ   c5-marriage

'chickens and fool of marriage'

        The lowering observed in these HMH sequences might be better described as a non-automatic process. The phenomenon is not well understood and calls for more study. Regarding tone transcription in this description, the examples presented in chapters following this one are unmarked for downdrift, since the downdrift of HLH sequences is highly regular and therefore predictable. The particular context of a nasal class noun with a lowering M prefix and a H root following another H is not all that common and does not appear in any of the text examples in this description. Therefore, tone diacritics (with no accompanying downdrift/downstep arrow) are to be understood as indicating surface tone for the most part, other than the downdrifted H of HLH sequences.

4.6.2   Downstep

Tonal register may be lowered in HH sequences where a floating L is postulated to intervene. This phenomenon is observed in Nchane, as illustrated in example (4.27). It should be noted that class 1 is probably a nasal class, with a large majority of class 1 nouns having a nasal onset. As mentioned in §4.4, the nasals of nouns belonging to a nasal class appear to have a lowering effect on a M prefix, which then is observed to behave like a L. Thus, it is somewhat ambiguous as to what is triggering the downstep: a floating L or a tonal effect associated with the nasal of the nasal class noun.

(4.27)   shí   bɛ́   ⁺tʃɔ́ŋ
          ᴴH   H   ᴸ- H
          c10.chicken   with   c1-thief

        Downstep (also known as non-automatic downstep) also appears to be observed in some HM nouns, as in (4.28), although it is not clear how the M is involved in the process. It is evident, however, that the two following H's are pronounced at a pitch lower than the H of 'fly'. Note that downstep does not occur with class 7 HM disyllabic roots in this particular H frame.

(4.28)   kī-dʒɛ̂   ⁺bɛ́   ʃĭ
          M – HM   H   ᴴH
          c7-fly   with   c10.chicken

Differing realization patterns for monosyllabic versus disyllabic roots are also observed for class 5 HM nouns, illustrated in (4.29). In this case, it appears that the roots of nouns with both syllable patterns are involved in downstep. However, with the monosyllabic root in (4.29)a, the downstep occurs at the H of the conjunction, consistent with the pattern observed with the monosyllabic class 7 root in example (4.28), while the downstep is realized at the final syllable of the disyllabic root in (4.29)b.

(4.29) a. Ø-tí: ⁺bɛ́ ʃĭ

     HM   H ᴴH

     c5-stomach with c10.chicken

   b. Ø-gvú⁺ní bɛ́ ʃĭ

     HM   H ᴴH

     c5-corpse with c10.chicken

No clear evidence is observed of downstep involving a floating M rather than a floating L.

4.6.3 M tone lowering

A floating L preceding a M often results in the realization of the M as a L, as shown in (4.30) and (4.31). (The M realization on "goat" is due to phrase-final rules described in §4.6.4.)

(4.30) jɔ̀ jì bï̀

   ᴸM L ᴸM

   c9.snake c9ᴀᴍ c9.goat

(4.31) Ø-kàŋ wù bī̀

   ᴸ- ML L ᴸM

   c1-rattle c1ᴀᴍ c9.goat

This process is apparently blocked when the floating L-M sequence is followed by a H, as demonstrated in examples (4.6) and (4.12) above. Furthermore, as mentioned in the introduction to Table 4.7, this rule may not apply following the floating M re-association rule.

4.6.4 Phrase-final boundary rules

Four different tonological phenomena are observed at phrase boundaries: floating M re-association, L lowering, partial M lowering, and M raising. Each of these processes is described below in turn.

Floating M re-association

Example (4.32) demonstrates a phrase-final floating M preceded by three L's. Presumably, the lexical M of "goat" is disassociated and replaced by the preceding floating L (according to the process described in §4.6.3). This leaves the M tone floating, which then must re-associate due to the presence of the preceding three L's.

(4.32)   Ø-lì   wù   bī
          ^{L}- L   L ^{L}M
          c1-oath   c1AM   c9.goat

Example (4.33) shows that a floating M can disrupt the required LLL sequence (with the sequence instead being L^{M}LL). This sequence then provides the necessary context for phrase-final L lowering, which is presented next.

(4.33)   jὲŋ   jì   bï̈
          ^{L}M   L ^{L}M
          c9.thigh   c9AM   c9.goat

L lowering

In phrases with three or more consecutive L's, the phrase-final L is realized as a SL, as in (4.34) and (4.35). In the case of the ML noun in (4.35), the contour is realized as a LSL fall.

(4.34)   Ø-kùŋ   wù   bï̈
          ^{L}- L   L ^{L}M
          c1-python c1AM   c9.goat

(4.35)   Ø-kfù̈   wù   Ø-kà(ä)
          ^{L}- ML   L ^{L}- ML
          c1-python c1AM   c1-rattle

Likewise, a phrase-final L is realized as SL when preceded by a LH sequence, as in (4.36).

(4.36)   Ø-kfù̈   wù   Ø-kɔ́mὲ̈
          ^{L}- ML   L   HL
          c1-rope   of   c5-harp

Returning to example (4.33), it was demonstrated that a L^{M}LL^M] did not provide the necessary context for the phrase-final M to be re-associated. However, this sequence does not provide the context for the phrase-final L lowering either. Therefore, the floating M's are either deleted by a stray erasure rule before this phrase-final lowering rule is applied or the floating M's are ignored.

Example (4.37) represents a case where a breath pause is present outside of a phrase boundary (presumably the pause here is due to the speaker gathering his thoughts). Just as in the examples above, the final L of the LLL sequence is realized as a SL.

(4.37) | bā | gɛ̄ | jɛ̄jɛ̀ | kɔ̀nɛ̏, | bā-ɲtʃī | bā | kī-jɔ̄ |
        |----|----|-------|--------|---------|----|-------|
        | M | M | M L | L L | M- M | M | M- H |
        | they | P3 | teach | about | c2-law | c2AM | c7-spirit |

'...they taught about the [four] spiritual laws...'   Training.1.7

Partial M lowering

As mentioned in §4.1, the tones of M and L verbs are realized as a falling tone (ML and LSL respectively) when utterance-final. A similar effect is observed in nouns with M tone. However, in this case, the M is usually only slightly lowered in pitch as compared to a normal M, and usually only if it is preceded by a H, as in (4.38). This lowering is observed even when the M has another (non-lowered) M intervening between it and the H, as illustrated in (4.38)b and c.

(4.38) a. | Ø-bɛ̄ŋ | bɛ́ | kwɛ̄ᵒŋ |
            |--------|-----|--------|
            | M | H | M |
            | c4-mosquito | with | c3.firewood |

'mosquitoes and firewood'

b. | kī-bɛ̄ŋ | bɛ́ | kī-tē̄ᵒ |
    |--------|-----|--------|
    | M- M | H | M- M |
    | c7-wing | and | c7-tree |

'wing and tree'

c. | gwí | wū | Ø-⁺lú | tʃī | kī-tē̄ᵒ |
    |-----|----|-------|-----|--------|
    | H | M | H | M | M- M |
    | c3.net | c3AM | c5-marriage | c5AM | c7-tree |

'net of marriage of tree'

When the phrase is long and there are more than two M's intervening, the phrase-final M does not lower.

M raising

The final phrase boundary process raises a phrase-final M to H when preceded by a LMM sequence and followed by a H. This process is illustrated in (4.39), where the M of the applicative marker **lē** is realized as H. Note that this process might be limited to clause-final M, with the following H belonging to a new clause.

(4.39)   mɛ̄   ŋ̀-gɛ̃:   à   màŋ-kàlà   mā-ā   lé   lé
               1SG.PRO   1SG-put   in   c6a-cassava.puff   c6a-ANA1   APPL   COP

              '...I put [rat poison] in that cassava puff. [It] is...'

                                                            What-goes-around.9.14

4.6.5   H raising

The source of a SH tone is not always clear. But most instances appear to be the result of a grammatical H realized on a word with a lexical H. This is illustrated in the examples below. Example (4.40) demonstrates a grammatical H (indicating Habitual aspect) on top of the lexical H of the verb **tɔ́** 'come', resulting in a SH.

(4.40)   ɲ̀dʒì   tɔ̋   wù   kɔ̄:   ŋ̀gɔ̄
             L   ^H=H   L   ML   ^HM
             N.   HAB=come   3SG   catch   c10.termite

             'Nji always catches termites.'

Similarly, a SH is realized on the 3PL subject marker **bɔ́** when the grammatical H indicating Future is also present. This is illustrated in (4.41).

(4.41)   bɔ́   lé   bɔ̋   gù   fìm-bì
             H   H   ^H=H   L   L-L
             3PL   COP   FUT=3PL   buy   c19-cola.nut

             'They will buy a cola nut.'

It might be that the consecutive preceding H's and the following L also contribute to the SH realization.

The example set in (4.42) involves H verbs in the progressive form. The progressive suffix is normally marked with a H tone as well. It is possible that the SH on the progressive suffixes here is a strategy to obtain contrast, since SH on the progressive suffix is not observed in non-H verbs.

(4.42)   a.   bī-dádɛ̀   bī   bā   sáŋ-ɛ̋   jé   jú
                 M- H L   M   M   H -^H=H   ^HM   H
                 c8-palm.branch   c8REL   they   thatch-PROG   c10.house   on.it

                '...palm branches, that they thatch houses with.'   King of Trees.1.3

b. ɲ̄-dʒɔ̀   ɲ̀tʃĩ   jī   bā   jú:-jĩ́

     M- L   ᴸML   M   M   H -ᴴ⁼H

     1ꜱɢ-take   c9.medicine c9ʀᴇʟ they kill-ᴅɪsᴛʀ.ᴘʀᴏɢ

     bī-kfūnè   jú,

     M- M L   H

     c8-rat   on.it

     '...I took medicine that they are killing rats with...'

                                        What-goes-around.9.14

However, the realization of SH is not always apparent in these contexts. Furthermore, some SH's are observed in other cases where there is no grammatical H present. Perhaps these SH's are part of a strategy of "correction" for declension or downdrift, so that the pitch does not go lower than desirable.

As a reminder, with the conclusion of the chapters dealing with the language's sound system, the remainder of the book utilizes the description orthography presented in §1.3.3.