CHAPTER 3 - THE NOUN .......................................................... 71

I. INTRODUCTION ................................................................. 71
   A. Noun Structure ......................................................... 72
   B. Noun Classes and Suffixing .......................................... 72
   C. Noun Tone ............................................................... 73

II. THE INDEFINITE SUFFIX - TYPE I .................................... 75
   A. Structure ............................................................... 75
   B. The Tonal Nature of Indefinite Nouns - Type I .............. 80
      1. The tone of the Indefinite Suffix - Type I .............. 82
      2. Association conventions and the Indefinite Noun ...... 84
      3. Tone and Pre-nasalized Consonants ....................... 87
      4. High final nouns ................................................. 89

III. THE INDEFINITE SUFFIX - TYPE II (Classes 2 and 6) ........ 91
   A. Structure ............................................................... 91
      1. Class 6 Indefinite Suffix. ....................................... 91
      2. Class 2 Indefinite Suffix ....................................... 94
      3. Summary ........................................................... 96
   B. Tone of Type II Indefinite Suffixes .............................. 97
      1. Tonal Behaviour of the Suffix .................................. 97
      2. Segmental Deletion and Tonal Behaviour ..................... 99
      3. Root tone lowering (High Deletion) ......................... 116
         a. High Deletion with Suffix Reduction (122); b. High
            Deletion with Full Suffix (124); c. Partial Suffix
            Deletion and Resistance to High Deletion (125)

IV. THE DEFINITE SUFFIX ..................................................... 128
   A. Structure - Type I .................................................. 129
   B. Structure - Type II nouns ........................................ 132
   C. Definite Suffix Tone ............................................... 134

V. CONCLUSION ................................................................. 141

NOTES .......................................................... 142
I. INTRODUCTION

The preceding chapter dealt with the morphology and tone of the verb. The examination of the tonal behaviour of the verb and the incompleteive suffix yielded several tentative rules. It will be seen in this chapter on the noun that some of the tonal behaviour identified on the verb is also found on the noun. For example, it was proposed in Chapter 2 that the Low tone of the verbal root spread onto the High tone of the completive suffix. Likewise, it is proposed in this chapter that certain nominal suffixes which are High initial are lowered to Mid tone through the process of Low tone Spread. Another point of similarity is the fact that nominal roots with certain types of tone lower to Low tone when followed by a particular kind of High initial suffix, just as Mid tone verbs lower to Low when followed by the High tone incompleteive suffix.

Other issues in this chapter concern the melodic nature of the noun and a complication in applying the Association Convention of Left to Right Linking. The matter of linking tones to segments is further complicated by the structural behaviour of certain nominal suffixes. One nominal suffix which, depending on several factors, can undergo various types of segmental deletions, poses problems for the relinking of tones which have lost their segments to deletion. These and other issues, such as the underlying tone of the various nominal suffixes, will be the focus of discussion in this chapter. The discussion of the underlying tone of the nominal roots themselves will, however, have to wait until Chapter 5 where a fuller discussion of the noun phrase as a whole will enable one to examine nominal tonal behaviour in the context of the phrase.

This chapter will first survey the general morphological and tonal structure of nouns as well the different types of nominal suffixing found in Sucite. It will then examine each type of suffix, providing a descriptive account of its segmental behaviour before describing and analyzing the tonal behaviour.
A. Noun Structure

Non-complex noun roots are normally composed of a noun root and a suffix. Noun roots are either monosyllabic or disyllabic and contain, at the most, two vowels. The syllabic sequences allowed on noun roots are noted below:

(1) a. CV  jà  ‘son’

b. CVCV  fòlò  ‘owner, chief, head of ...’

c. CVV  fìi  ‘python’

The initial consonant of a noun root may be pre-nasalized.

d. NCV  ndì  food (from li ‘to eat’)

e. NCVCV  ŋgur-xo  smoke-suffix (from wò ‘to blacken’ ?)

B. Noun Classes and Suffixing

All nouns in Sucite are grouped into noun classes which are most frequently marked by a suffix. There are 8 noun classes in Sucite, three singular, three plural, and two mass / collective classes. Each class has an indefinite and a definite suffix. For the purposes of analysis, these classes are grouped into two categories (labeled Type I and Type II), according to the phonological shape of the indefinite suffixes. Below are examples of definite and indefinite nouns for each noun class with the suffixes being underlined.
C. Noun Tone

Sucite nouns exhibit nine different tonal patterns. All except one can be found on Class 1 nouns with a 0 suffix. The ninth, Low-High tone, can be found only on nouns that possess a class suffix.

(3) High <6>  wére  `money'
    High-Mid <16>  fyáa  `fish'
    High-Low <5>  jò  `pocket'
    Mid <42>  gba  `river'
    Weak Mid <39>  caan  `market'
    Mid-Low <7>  conlò  `younger sibling'
    Mid-Low W <42>  jà  `son'
    Low <77>  cà  `child'
    Low-High <22>  gbôn-lò  `granary'

Although there are a variety of tonal shapes on nouns, word final tone is either High, Mid or Low tone. It will be seen later in Chapter 4 that each of

*  < > = number of examples in a data sample of simple non-complex nouns of all classes.
these three tones affects the following verbal element in different ways. On the surface there are also only three levels of tone word initially. However, it will be seen in Chapter 5 that the initial tone of nouns exhibits a four way contrast. The labels, High, Mid, Weak Mid and Low represent this four-way contrast, which becomes evident when the noun in question is preceded by another nominal in a noun phrase.

There are three types of High initial nouns, High, High-Mid, and High-Low. Although all of these nouns can trigger tonal rules, their own tone never changes. Almost all High and most High-Low nouns are loan words. High-Mid nouns seem to be more indigenous to Senufo. One characteristic of the latter is that they seem to require two tone bearing units. Altogether High initial nouns account for only 27 nouns in the data sample of about 255 nouns. The question that immediately comes to mind is, why such a small number? This question will be dealt with in Chapter 5 when we discuss the underlying tone of nouns.

A distinction is made between weak Mid nouns and Mid nouns because, although they have the same pitch in citation form, they differ in tonal behaviour in other contexts. The weak Mid nouns as well as the Mid-low W nouns, are more susceptible to certain tonal changes than are Mid and Mid-Low S nouns. This will be made clear in Chapter 5.

There are two types of Low initial nouns, Low and Low-High. Low tone nouns form the largest group in the data sample (about 77 nouns). Low initial nouns are subject to a High Spreading rule, which will be described and discussed in chapter 5.

Since most nouns possess a suffix of some type, further discussion of nominal tone can be found in section II.B.
II. THE INDEFINITE SUFFIX - TYPE I

A. Structure

As was mentioned above, there are two types of indefinite suffixes. Type 1 indefinite suffixing is the simplest. Its basic form is -CV. The consonant varies according to class affiliation (See chart (2) above) and the vowel is either the same or very similar to the vowel of the noun root, regardless of class affiliation. The only vowels not allowed on the suffix are the high vowels, /i/ and /u/. It appears, from looking at the examples below in (4), that the suffix vowel is essentially a copy of the root vowel except when the root vowel is [+high], at which point the suffix vowel is [-high], but it acquires the same feature for [+ or - back] as the root vowel (see (4f,g) below). The only feature that seems to be consistent for the Type I suffix vowel, then, is the [-high] feature.

(4)a. Gba-xV -> gba-xa `house'
   b. ccn-xV -> ccn-xɔ `sauce'
   c. gbɔn-lV -> gbɔn-łɔ̀ `granary'
   d. fɔ-xV -> fɔ-xɔ `corn'
   e. kɔ-rV -> ka-rà `meat'
   f. sù-lV -> sù-łɔ `floor'
   g. ci-lV -> ci-lè `thigh'

Whether the Type I class suffix vowel is underlyingly featureless or whether it does possess the [-high] feature is an issue that cannot be fully addressed here, within the scope of the thesis. However, investigation of the data in the Noun Lexicon, which is located in the appendix, will reveal the patterns of behaviour very briefly sketched above.
All the nouns of Noun Classes 1, 3, 4, 5, 7 and 8 possess the Type I indefinite suffix. As was mentioned above, the basic shape of the suffix is -CV. However, not all Type I nouns bear this basic shape. Some appear to have no suffix at all. The leftside column of chart (5) indicates that three classes have examples of suffixless nouns. While only the minority of nouns in Classes 3 and 8 are suffixless, the majority of Class 1 suffixes are in this group. One possible reason for this is that the -CV suffix for Class 1 nouns, -wV, was historically reduced to a vowel and then finally deleted. However, at this stage, there is no evidence of an earlier -wV suffix on most suffixless Class 1 nouns (but see discussion of disyllabic noun roots, p. 79). Because there is no apparent indefinite suffix on this set of nouns, it is difficult to ascertain at this point to which class they actually belong. However, in chart (90) in section IV, on the definite suffix, class affiliation is made clear by the type of definite suffix used.

(5) Monosyllabic Noun Roots

<table>
<thead>
<tr>
<th>Cl.</th>
<th>Root</th>
<th>0 Suffix</th>
<th>-CV Suffix</th>
<th>-(N)CV Suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>jà 'son' &lt;33&gt;</td>
<td>*</td>
<td>ce-wè 'woman' &lt;1&gt;</td>
<td>cèn-ŋè 'antelope' &lt;1&gt;</td>
</tr>
<tr>
<td>1.3</td>
<td>nà 'fire' &lt;3&gt;</td>
<td>tè-xè 'place' &lt;33&gt;</td>
<td>wye-ŋè 'leaf' &lt;25&gt;</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>0</td>
<td>tè-yè 'places'</td>
<td>wyen'yè 'leaves'</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>0</td>
<td>ci-lè 'thigh' &lt;37&gt;</td>
<td>sè-nè 'sting' &lt;5&gt;</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>0</td>
<td>su-rò 'main dish' &lt;19&gt;</td>
<td>kòò-nò 'cotton' &lt;1&gt;</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>juu 'speech' &lt;2&gt;</td>
<td>tš-be 'medicine' &lt;1&gt;</td>
<td>su-mè 'millet beer' &lt;10&gt;</td>
<td></td>
</tr>
</tbody>
</table>

* **Numbers in angled brackets indicate the number of like examples in the data sample of simple non-complex nouns, represented by the word in the chart. For example, jè <33> means there are approximately 33 monosyllabic Class 1 nouns, in a lexicon of about 255 simple monosyllabic and disyllabic nouns.
There is another set of nouns which have primarily nasal indefinite suffixes. Although data on Definite suffixing (see chart (90)) provides clearer evidence for class affiliation, the right side column of chart (5) provides examples of nasalized indefinite suffixes for each class. What seems to be happening is that there exists a set of noun roots which possess a final underlying nasal consonant. When this consonant is followed by an indefinite suffix it assimilates to the indefinite suffix, which in turn, becomes [+nasal]. The two coalesce and become a single nasal consonant, as shown in (6) below.

(6) fuN-xV -> fuη-xV -> fuη-ηV -> fuηV -> fuηò `inside'

Since there is no such thing as a word that ends in a nasal consonant in Sucite, it may be debatable whether one can posit an underlying nasal consonant in these cases. An alternative analysis is to suggest final nasalized vowels, which are indeed plentiful in the language. However, the examples below, (7), indicate that nasalized vowels apparently do not trigger the nasalization of indefinite suffixes:

(7) a. çɛn-xɛ `sauce' *çɛɲɛ
    b. gbon-lò `fireplace' *gbonò

For this reason, we propose that it is an underlying final nasal consonant which causes the nasalization of indefinite suffixes. Further research needs to be done, however, on the nature of nasality in Sucite.
Disyllabic roots follow the same patterns of suffixation. The reader will recall that the types of consonants allowed on unstressed syllables (i.e. non-initial syllables) are extremely limited. As a result, the consonants allowed on the second syllable of nouns are restricted to the ones given below in Row a. of chart (8). Noun roots which are terminated by a nasal are given in Row b.

(8)

<table>
<thead>
<tr>
<th>a.</th>
<th>b.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-l-</td>
<td>l-VN</td>
<td></td>
</tr>
<tr>
<td>-r-</td>
<td>r-VN</td>
<td></td>
</tr>
<tr>
<td>-ʔ-</td>
<td>ʔ-VN</td>
<td></td>
</tr>
<tr>
<td>-x-</td>
<td>x-VN</td>
<td></td>
</tr>
</tbody>
</table>

Cl.1 a. folò <22>   sáru <10>   fyèxù <2>
'owner'   'bee'   'earring'

b. céré-ŋe <1>   ˈorphan'

Cl.3 a. gbèlè-xè <7>   ںgur-xo <12>   kàn?à <6>
'well'   'smoke'   'village'

b. nkörè-ŋò <2>   mën?en-ŋè <6>
'fallow land'   'story'

Cl.4 a. gbèli-yè   ںgur-yo   kàn-yà
'wells'   'smokes'   'villages'

b. nkôrî-yò   mën?en-nè
'fallow lands'   'stories'

Cl.5 a. kù-dò <14>   sèʔè-li <1>
'chair'   'large basket'

b. sèʔé-nc <1>
'palm nut'

Cl.7 a. kôʔò-rò <1>   tuxu-rò <2>
'dance'   'load'

b. ndûxè-nò <1>
'seeds'

Cl.8 a. no examples

b. fert-mc <2>   ˈurine'
A couple of Class 1 disyllabic roots shown in chart (8) have a final high backed vowel. It was mentioned earlier that the proposed underlying suffix for Class 1 is \(-wV\), which, in many cases appears to be totally deleted. In the examples given above, however, it appears that the \(-w\) of the suffix may have caused the raising of the final root vowel before being deleted, as shown below:

(9) sårV-wV -> såru-wV -> såru  `bee'

In Class 3 of chart (8), the noun roots that possess a glottal stop appear to have no suffix. It is possible that the suffix coalesces with the glottalized syllable, resulting in a single syllable (kàn?à - xà -> kàn?à). When the root is marked for a final nasal, this coalescence does not take place:

(10) mën?ëN - wV -> mën?ëî *mën?ë  `stories'

Class 5 (li) has a number of nouns where the second syllable of the root is underlyingly \(-rV\). However, the consonant of this second syllable coalesces with the suffix consonant, \(-l-\), producing a surface \(-d-\).

(11) kùrV - lV --> kùr -1V --> kùdò  `chair'

We know that there is an underlying \(-r-\) by looking at the plural class (Class 6) of this group of words. The indefinite plural of `kùdò' is `kòr̤-lo'.
B. The Tonal Nature of Indefinite Nouns - Type I

In isolation, the Type I indefinite noun has the following tonal patterns:

(12) Key: ( ) Class number; (L) Loanword; < > Number of examples in data

<table>
<thead>
<tr>
<th>Syllables</th>
<th>1 Syllable</th>
<th>2 Syllables</th>
<th>3 Syllables</th>
</tr>
</thead>
<tbody>
<tr>
<td>High &lt;6&gt;</td>
<td>0</td>
<td>wërë (1) &lt;5&gt;</td>
<td>fálé-xà (3) &lt;1&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'money (L)'</td>
<td>'rock (L)'</td>
</tr>
<tr>
<td>High-Mid &lt;16&gt;</td>
<td>fyáà (1) &lt;4&gt;</td>
<td>sárú (1) &lt;8&gt;</td>
<td>cérë-ŋc (1) &lt;4&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'fish'</td>
<td>'bee'</td>
</tr>
<tr>
<td>High-Low &lt;5&gt;</td>
<td>jò (1) &lt;1&gt;</td>
<td>sú-lò (5) &lt;3&gt;</td>
<td>bárá-xà (3) &lt;1&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'pocket'</td>
<td>'floor'</td>
</tr>
<tr>
<td>Mid &lt;42&gt;</td>
<td>gba (1) &lt;8&gt;</td>
<td>gba-xa (3) &lt;36&gt;</td>
<td>ṭmol- xo (3) &lt;5&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'river'</td>
<td>'house'</td>
</tr>
<tr>
<td>Weak Mid’ &lt;39&gt;</td>
<td>caan (1) &lt;6&gt;</td>
<td>sì-xè (3) &lt;28&gt;</td>
<td>fërën-më (8) &lt;5&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'market'</td>
<td>'bush'</td>
</tr>
<tr>
<td>Mid-Low &lt;7&gt;</td>
<td>0</td>
<td>conlò (1) 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'younger sibling'</td>
<td></td>
</tr>
<tr>
<td>Mid-Low W*&lt;42&gt;</td>
<td>jà (1) &lt;7&gt;</td>
<td>fu-ŋò (3) &lt;30&gt;</td>
<td>tuxu-rò (7) &lt;5&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'son'</td>
<td>'inside'</td>
</tr>
<tr>
<td>Low &lt;77&gt;</td>
<td>cà (1) &lt;18&gt;</td>
<td>pù-lò (5) &lt;50&gt;</td>
<td>fèlë-xè (3) &lt;11&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'child'</td>
<td>'body'</td>
</tr>
<tr>
<td>Low-High &lt;22&gt;</td>
<td>0</td>
<td>gbòn-lò (5) &lt;19&gt;</td>
<td>ndorë-xò (3) &lt;3&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'granary'</td>
<td>'yam'</td>
</tr>
</tbody>
</table>

There are many fewer tonal minimal pairs on nouns than there are on verbs.

* Mid Weak nouns differ from Mid tone nouns in that they are more susceptible to certain tonal changes, which will be discussed in Chapter 5.
This is likely partially due to the fact that there is more of a variety of tonal shapes on nouns and that the plurality of noun classes alter the segment-al shape. The most common minimal pairs seem to involve a Low tone noun. High-Mid nouns are the only High tone nouns involved.

(13) a. Low vs. Mid-Low

kùdò, kù-ne 'seat, the seat'      kudò, kù-ne 'road, the road'

nọ 'cow'      nọ 'mother'

sèmè, sèm-be 'oil'      sımè, sèm-be 'sorghum beer'

b. Low vs. High-Mid

sè?èlè, sè?è-ne, sè?è-ŋi, sè?è-ŋ-gí 'basket, the basket, baskets, the baskets'

sè?ènè, sè?è-né, sè?è-ŋi, sè?è-ŋ-gí 'palm nut, the p.n., palm nuts, the p.n.'

c. Low vs. Low-High

lùlò, lùù-ne 'bile, the bile'      lùlò, lùù-né 'shea nut, the shea n.'

bèlè, bè-ne 'seed, one of'      bèlè, bènè 'ground nut, the gr.pea'

d. Low vs. Weak Mid

ndèxè, ndè-ke 'root, the root'      ndùxe, ndù-ké 'ear, the ear'

e. Mid-Low vs. Mid

korò-xò, korè-ke 'inheritance, the inheritance'

korìxò, korì-ké 'brick mold, the brick mold'

f. Weak Mid vs. Mid

sixè, si-kè, ndè sé-ke 'bush, the bush, my bush'

sixè, si-kè, ndì si-kè 'feather, the feather, my feather'
A tiny handful of minimal triplets have been found which involve morphological tone:

- **g. Low-High (Fall)**
  - Low High
  - mënê
  - 'a sweet ground nut'

- **g. Low Mid**
  - Low Mid
  - mène
  - 'sweet ground nuts'

- **h. Low Mid**
  - siń
  - 'people'

- **h. Mid-Low**
  - Mid-Low
  - siń
  - 'relative, family'

- **h. Mid-Low Mid**
  - Mid-Low Mid
  - siń
  - 'parents'

Note that there are no minimal pairs involving Low tone and Mid tone, though there is one contrasting pair of Low and Weak Mid tone nouns. Note in (13f) that Weak Mid tone nouns are more susceptible to tonal changes than are regular mid tone nouns. These differences will be discussed in Chapter 5.

### 1. The tone of the Indefinite Suffix - Type I

The first question that must be asked concerns the underlying tonal nature of the indefinite suffix. Upon examination of the examples in chart (12), one sees that the suffix, which is separated from the rest of the word by a hyphen, can have a High, Mid, or Low tone. The tone on the final syllable of the root does not seem to be a factor in determining the tone of the suffix either, for a Low tone suffix can be preceded by a High, Mid or Low tone root. A Mid tone suffix can be preceded by a High or Mid tone root, while Low and High tone can precede a High tone suffix. Since there is such variability for the tone of the suffix, it is rather difficult to discern any underlying tone for the suffix.

We are then faced with the possibility that the indefinite suffix may not be marked for any particular tone. If one surveys the tonal patterns of indefinite nouns, one discovers that the melodic patterns seem to include the indefinite suffix. If a noun
is Low tone, one tonal feature, Low, can be used to link to all the TBU's (tone-bearing units) of the noun, including the indefinite suffix.

(14) cà `child'  pù-loö `body'  fàlè-xè `mat'

If the noun has a contour tone, such as Mid-Low, the following pattern emerges. On a noun with a single TBU, the Mid and the Low tone are linked to the same TBU:

jà `son'

When a noun has two TBU's, the Mid tone links to the first TBU, while the Low tone links to the final TBU, regardless of whether that final TBU is an indefinite suffix or not:

conlò `younger sibling'  fu-ŋò `inside'

A noun with three TBU's normally consists of a disyllabic noun root and an indefinite suffix. If the tone of the suffix were simply considered to be a tonal copy of the final tone of the noun root, one might expect a Mid-Low-Low pattern. Instead, a Mid-Mid-Low pattern emerges:

*tuxù-ro  tuxu-rò `load'

In fact there are never any cases of a Mid-Mid-Low tonal pattern to be found on non-complex nouns. Since all nouns which carry a Mid tone and a Low tone have a predictable way of linking to the segments of the noun, one can suggest that Sucite nominal tone is melodic in nature.
The behaviour of the other contour tones such as High-Low, Low-High, and High-mid further supports this melodic hypothesis. All of them have a predictable way of linking tone to segments and all of them link tone to segments according to the same pattern described above for Mid-Low nouns. That is, if a noun root with two TBU’s as well as an indefinite suffix possesses a contour tone, the second tone of the contour links only to the final TBU of the word. This is shown below for all contour tones.

(15) tuxu-rô `load'  cárê-ñe `orphan'  ndôrê-xô `yam'  bârê-xà `strength'

M  L
H  M
L  H
H  L

2. Association conventions and the Indefinite Noun

Now that a melodic pattern for these Indefinite nouns has been isolated, it is appropriate to discuss the conventions or rules needed to associate the tones to the segments in a predictable way.

Pulleyblank (1983) proposed the following version for the linking of tone to tone-bearing units on the segmental tier:

(16) ”(14) Association Conventions:

Map a sequence of tones onto a sequence of tone-bearing units,

a) from left to right

b) in a one-to-one relation.”(p.31)

Any leftover tone-bearing units, he continues, will be assigned tones according to language specific rules only and any leftover tones will be assigned a TBU only if specified by a language specific rule. This approach is a little different from authors such as Williams (1971) who propose to include the linking of extra tones and TBU’s as part of the universal Association Conventions. At this point, there does not seem to be any need to posit separate rules for this extra linking in
Sucite. Thus, any extra TBU's will be associated to the adjacent tone, while any extra tones will be linked to the adjacent TBU, as shown below.

(17) fələ-xè `mat' jà `son' jò `pocket'

Let us consider the convention of Left to Right Linking. If we apply Left to Right linking to nouns with contour tones, we immediately run into problems. It was stated above that the final tone of the contour is found only on the last TBU of the noun. Linking tones from left to right across the word, however, would incorrectly predict that the second tone of the contour is linked to both the second and third TBU of a three TBU word. From the example with three TBU's above (17), it is clear that the second tone of the contour is not linked to the second TBU of the noun. Considering that the last TBU of a three TBU noun is a toneless indefinite suffix, one could devise adjustment rules in which the second tone of the contour would also link to this final TBU, and then the first tone of the contour would spread onto the second TBU; finally, the second tone of the contour would be delinked from the second TBU, producing an acceptable tonal pattern for the three TBU noun. This proposed sequence of rules is illustrated by the example given below.

(18) tuxù-ro -> tuxù-rò -> tuxu-rò `load'

This seems to be a cumbersome way to deal with what seems to be a rather simple pattern. However, before we discard this approach and seek better alternatives, it is interesting to note that the neighbouring Senufo dialect, Supyire, seems
to have evidence supporting the rule of spreading of the first tone of the contour onto the second TBU and motivating a rule delinking the second tone of the contour from the second TBU. In the Supyire case, however, the first tone of the contour continues spreading to the final TBU of the word as well, and triggers the delinking of the final tone of the contour, such that the surface output of the noun produces no tonal contour. In fact, there are no surface contour tones on indefinite nouns in Supyire. However, tonal behaviour indicates that certain nouns do have underlying contour tones.

Let us consider one example of this type of spreading in Supyire. What are called Low-High nouns in Sucite are referred to as Low-weak Mid by Carlson (1985) in Supyire. He motivates a total Low Spreading rule where a Low is spread onto the following TBU which is linked to a weak Mid tone. This weak Mid tone is then delinked as a result of Carlson’s Low-Mid Simplification Rule. The Low-spreading and LM Simplification Rules are then repeated for any remaining TBU’s in the word, until all TBU’s in the word are linked to Low tone.

(19)a. tuu-go --> tuu-go --> tuu-go --> tuu-go -->

L  Mw      L  Mw       L  Mw     L  Mw

L-Spread   LM-Simplification  L-Spread   LM-Simp.

Carlson also shows how this pattern of rule application works for Mid-Low nouns.

One wonders, however, whether this is a viable analysis for Sucite. If we motivated these rules for spreading and delinking in Sucite, we would have to block this spreading and delinking from applying to the final TBU of the noun, for unlike Supyire, the final tone of a tonal contour is preserved on the final TBU of the
noun. The second problem with this approach involves data that will be dealt with in Chapters 4 and 5. Since a Mid tone spreading rule and a Low tone spreading rule can be motivated elsewhere in the language, it is conceivable that they could also be motivated word internally. However, a High tone spreading rule cannot be motivated in Sucite (though it can in Supyire); therefore it would be somewhat cumbersome to allow a High spreading rule word internally for High-Mid and High-Low nouns while blocking its application elsewhere in the language.

An alternative solution is to forego the linking of tones to the segments until the adding of the indefinite suffix, and then to link the tones from right to left across the word, as seen below.

(20) cérè-ñe `orphan’  tu xu-rò `load’  bârè-xà `strength’  ndôrè-xò `yam’
     H  M        M  L       H  L       L  H

This approach of Right to Left Linking seems to be a much more efficient way to deal with basic tonal patterns of nouns in Sucite. It eliminates the need for a series of rules word internally, and allows the natural tonal pattern of nouns to be represented in a simple and uncomplicated way. In addition, the arguments presented here will be supported by more evidence in the ensuing chapters.

3. Tone and Pre-nasalized Consonants

It was mentioned in Chapter 1 that there exists a set of nouns with pre-nasalized consonants. Careful scrutiny of the tonal behaviour of nouns with pre-nasalized consonants revealed that some of these consonants bear a Low tone while others do not seem to be marked for any particular tone. The distinction between those that
CHAPTER 3 - THE NOUN

carry a Low tone nasal and those which do not is barely perceptible in citation form. However, in connected speech, this distinction is made clearer. The low tone of a nasal is often linked to the final syllable of the preceding word (see 21a and c), while those nouns that do not carry a Low tone pre-nasal have no apparent effect on the tone of the preceding word (b and d).

(21) a. ndì ŋkúnà -> ndê nkúnà  `my wooden bowl'
   b. ndì mbínè  `my bamboo mat'
   c. ndì ya ŋkúnà nyàà -> ndì yà nkúnà nyàà  `I am seeing a bowl'
   d. ndì ya mbínè nyàà  `I am seeing a bamboo mat'

Word initial nasal consonants are also sometimes found to be tone bearing. This is represented by doubling the nasal in some cases, though in reality, long nasals are not always perceptible. Below are list of examples showing that a Low tone nasal can be found preceding Mid and High initial nouns.

(22)a. L-Mid S  ìmpi (2)  `rabbit'
        ìma (1)  `gift'
   b. L-Mid W  ìbi (8)  `flour'
        ìnya (3)  `grass'
        ìnyo (3)  `mouth'
   c. L-High-Mid  ñáa (1)  `scorpion'
        ñó-lu (5)  `guinea hen'
        ìáa (1)  `twin'
        ìpú-lu (1)  `spider'
   d. L-High  `zébê (1)  `good luck charm (Loan)'
   e. L-High-Low  ŋkúnà (3)  `wooden bowl'

If one applied the Right to Left Linking Convention to Low initial words with
prenasalized consonants, however, an incorrect surface form would be produced, as shown below.

(23) *ŋjeéne rather : ŋjeéne stone
\[\begin{array}{c}
L \ H \ M \\
\end{array}\]

*ŋtide rather : ŋtide `bat'
\[\begin{array}{c}
L \ M \\
\end{array}\]

This problem could be easily remedied with the suggestion that tone-bearing nasals be specified for Low tone and that this Low tone is linked to the nasal before the application of the Association Conventions. The low tone is linked to the nasal and the remaining tones are linked from right to left.

4. High final nouns

The preceding noun charts have included High final nouns. However, in citation form or in phrase final position these High final indefinite nouns, namely, High and Low-High tone nouns, exhibit a final falling tone.

(24)a. ndør-xô  `yam'
fálé-xà  `rock'

Indefinite nouns which acquire a final High tone through rule application also exhibit a final High falling tone.

b. soxo  nåà soxô  `man's mortar'
`mortar'  poru sóxô  `daughter's mortar'

This falling tone disappears, however, when the high tone is not in phrase final position.

(25) waa ndørèxô wéé  `he looked at a yam'
waa ndørèxô nyà  `he saw a yam'
In contrast, High tone verbs and postpositions, and High final definite nouns have no final falling tone. The natural first assumption that one is likely to make is that final High falling nouns actually have a final Low tone. In order to test this possibility, one must compare the behaviour of these nouns with those that are known to have a Low final tone. Low final nouns are known to trigger Low tone spreading onto High tone verbs (see Chapter 4 for details):

(26) a. waa mòlò wéé -> waa mòlò wèé  `He looked at rice'

However, fàlèxà and ndòrèxò do not trigger Low tone spreading:

b. waa ndòrèxò wéé -> *waa ndòrèxò wèé  `he looked at a yam'
c. waà fàlèxà wéé -> *waà fàlèxà wèé  `he looked at a rock'

Therefore, one is led to conclude that the falling tone exhibited on High final nouns is a phonetic peculiarity which is manifest only when a High final indefinite noun is in phrase final position. In order to characterize this phrase final tonal adjustment, a Low tone insertion rule may be formulated:

(27) LOW TONE INSERTION: Insert a Low tone to the final TBU of a High final noun when it is in phrase final position.

```
X ## -> X ##
H  H L
```

This Low tone Insertion would effectively create a falling tone on a High final noun: fàlèxà -> fàlèxà  `rock'
III. THE INDEFINITE SUFFIX - TYPE II (Classes 2 and 6)

A. Structure

We have just examined the tonal behaviour of nouns which use the Type I indefinite suffix. The nouns of Classes 2 and 6, however, use a different type of suffix, labeled here as the Type II indefinite suffix. As plural classes, they have the same noun roots as Classes 1 and 5, respectively. Although their indefinite suffixes are underlyingly disyllabic, the surface form is often monosyllabic. Tonally, the two class suffixes behave in the same way. The initial tone of both suffixes alternates between High, Mid and Low tone depending on the tonal environment, while the final tone tends to be a more stable Mid tone. Because of the complexity of both the segmental and tonal processes, I have chosen to discuss the segmental changes first before dealing with tone.

1. Class 6 Indefinite Suffix. In Cebara, the Class 6 suffix is -gele, whereas in Supyire, it is -gili or -lV. In Sucite, we have a variety of suffixing which probably can be attributed to the same underlying morpheme, -xVlV. In certain cases, described below, the vowel is high. How vowel height can be accounted for using the present underlying representation, -xVlV, will not be discussed here.

Examples with the full disyllabic suffix are given below:

(28) CLASS 5 CLASS 6 <24>
   a. pù-lò   pò-xlo   'bodies, trunks'
   b. ci-lè   ci-xlè   'thighs'
   c. nci-le nci-xlè   'balaphons'
Sometimes the fricative velar is glottalized:

(29) CLASS 5      CLASS 6 <11>
   a. co-lò     có-ʔi-lo      'clay pots'
   b. fo-lò     fò-ʔi-lo      'debts'

Many times, however, the disyllabic suffix is partially deleted or practically disappears altogether. A few nouns lose the final syllable of the suffix, -lV in a process that shall be called SUFFIX FINAL DELETION. When this happens, the suffix vowel is always high.

(30)      CLASS 6 <4> SFD
   a. kòrè - xVlV  ->  kò-rè-xi   'seats, chairs'
   ti - xVlV  ->  tií-xi    'cock's combs'

In certain cases, this shortened suffix is also nasalized. Note that nasalization is not triggered necessarily by a nasal environment:

   CLASS 6 <12>
   b. mpù - xVlV  ->  mpùú-qi   'hills'
   ntàn - xVlV  ->  ntàà-qi    'courtyards'
   jèrè - xVlV  ->  jè-rè-qi   'breasts'

It is interesting to note that when suffix final deletion takes place, single TBU roots compensate for the loss of a syllable by lengthening the root vowel to two TBU's (see (31a), while roots with two underlying TBU's do not change (31b).

(31)a. Single TBU roots

   mpù-ú-qi   'hills'
   ti-í-xi    'cock's combs'
   ntà-à-qi   'courtyard'
b. Double TBU roots

\begin{itemize}
  \item \textit{.jarê-øi} \ 'breasts'
  \item \textit{sèøê-øi} \ 'basket'
  \item \textit{sèøë-øi} \ 'palm nut'
\end{itemize}

The final result is that all of the above forms possess three TBU's. A second look at the data reveals that all Class 6 noun roots with two underlying TBU's seem to require some kind of suffix deletion, in order to maintain the limit of three TBU's for a Type II noun, while single TBU roots with partially deleted suffixes require a lengthened vowel to keep up a three TBU minimum.

\textit{Suffix Initial Deletion} is another way to reduce the size of the suffix. Some disyllabic noun roots with a second syllable of the shape, \textit{-rV-}, trigger the deletion of the first syllable of the suffix instead of the second.

\begin{itemize}
  \item \textbf{(32) Class 6 <8> Suffix SID}
    \begin{align*}
      \text{kiø-} & \text{-xVlV} \to \text{kiø-r-ı-le} \quad \text{\`countries'} \\
      \text{cèrè-} & \text{-xVlV} \to \text{cè-r-ı-le} \quad \text{\`eggs'}
    \end{align*}
\end{itemize}

There are also a few examples where the entire indefinite plural suffix is reduced to a single vowel (\textit{Suffix Reduction}):

\begin{itemize}
  \item \textbf{(33) Class 6 <4> Suffix RED}
    \begin{align*}
      \text{nyè-} & \text{-xVlV} \to \text{nyi-ı} \quad \text{\`eyes'} \\
      \text{yr-} & \text{-xVlV} \to \text{yè-e} \quad \text{\`years'}
    \end{align*}
\end{itemize}

Note that this set of nouns does not require a final output of three TBU's, as is the case for other forms of the Class 6 suffix.
Finally, there are a few cases where the only indication of plurality is the tonal change. In the examples below, the Class 5, or singular form, is compared with Class 6:

(34) CLASS 5 CLASS 6 <3>

a. mènè mène `sweet ground nuts'
b. bèlè bèle `ground nuts'

We will not attempt to formulate rules here to account for suffix reduction and partial suffix deletion. Some Senufo dialects maintain the entire suffix, while others reduce it to a minimal unit. There may be some synchronic phonologically conditioning rules for suffix reduction, but, from these examples, it is not clear that any such rules exist. However, it will be seen shortly that the final tonal shape of a word will depend on the type of suffix deletion.

2. Class 2 Indefinite Suffix. The Class 2 indefinite (plural) suffix is historically disyllabic also, but in Sucite, the final output is monosyllabic. In Cebara, of Ivory Coast, the plural form is bèle. In Supyire, the Class 2 suffix is either -li, or -mili. In Sucite, the most common form of suffixation is -lV (perhaps through SUFFIX INITIAL DELETION):

(35) sónlu - CVlV -> sónlu - lV -> sónl-š-lû `parakeets'

Below are other examples in comparison with their singular counterparts of Class 1.

(36) CLASS 1 CLASS 2 <38>

pààn páan-la `alligators'
fýāa fýāa-la `fish'
sónlu sónl-š-lô `parakeets'
poru poré-lo `daughters'
Nouns with single TBU roots exhibit a long vowel. The second TBU of the long vowel may be a result of compensatory lengthening of the root vowel or it is possible that in these cases, only the initial consonant was deleted.

(37) ja - CV1V -> ja - 1V -> ja-V-V1V -> ja-a-la

SUFFIX INITIAL DELETION VOWEL LENGTHENING.

or ja -CV1V -> ja - V1V -> ja-ala CONSONANT DELETION

a. jô jô-lô 'pockets'
b. já jaà-la 'sons'

For reasons that may seem arbitrary for the moment, I shall choose the rule of Suffix Initial Deletion where both the consonant and the vowel are deleted. If we chose Consonant only Deletion, the noun roots with two TBU's (36), would require an additional rule of vowel deletion.

There are examples indicating that the underlying (or historical) form of the suffix may have been -mili or -mV1V. These nouns have dropped the -lV part of the suffix (SUFFIX FINAL DELETION), but retained the first part in the form of -mi.

(38) CLASS 1 CLASS 2 <10> SFD

a. ñnáa ñnáá-mi 'scorpions'
b. cènqè cèn-mi 'antelopes'
c. cèrèqè cèrè-mi 'orphans'

Again, as in Class 6 above, there are a few cases where the only indication of indefinite is the addition of a tone-bearing vowel (SUFFIX REDUCTION).
(39) **CLASS 1  CLASS 2  SUFFIX RED**

a. nò  nii  ‘mothers’

b. folò  fèe  ‘owners, chief, head of ...’

c. nçà  nçàa  ‘sheep’

It should be noted that in Kangala, a village situated 5 kilometres from Kotoura, the speakers have not allowed Suffix Reduction. Here, instead of saying *fèe* ‘owners’, they retain the _-LV_ suffix: *fèele*.

3. **Summary**. The following chart provides a summary of the different types of suffixing for Type II Indefinite Nouns:

(40)

<table>
<thead>
<tr>
<th>Suffix Type</th>
<th>Class 6</th>
<th>Class 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Full</strong></td>
<td>pò-xulo &lt;24&gt; ‘bodies’</td>
<td>******</td>
</tr>
<tr>
<td></td>
<td>cò- ?&gt;/ulo &lt;11&gt; ‘clay pots’</td>
<td>******</td>
</tr>
<tr>
<td><strong>Suffix Final DEL</strong></td>
<td>tií-xi &lt;4&gt; ‘cock’s combs’</td>
<td>******</td>
</tr>
<tr>
<td>Nasal</td>
<td>ntàà-ŋi &lt;12&gt; ‘courtyards’</td>
<td>çèèn-mi &lt;10&gt; ‘antelopes’</td>
</tr>
<tr>
<td><strong>Suffix Initial</strong></td>
<td>kirü-le &lt;8&gt; ‘countries’</td>
<td>jaà-la &lt;38&gt; ‘sons’</td>
</tr>
<tr>
<td><strong>Deletion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suffix Reduction</strong></td>
<td>nyì-i &lt;4&gt; ‘eyes’</td>
<td>nì-i  ‘mothers’</td>
</tr>
<tr>
<td><strong>Tone Change Only</strong></td>
<td>mè-ne &lt;3&gt; ‘sweet ground peas’</td>
<td>******</td>
</tr>
</tbody>
</table>

Single TBU noun roots can retain the entire suffix as well as undergo any type of suffix deletion. Nouns roots with two TBU’s obligatorily undergo either Suffix Final Deletion or Suffix Initial Deletion but never Suffix Reduction. Other than these general guidelines, however, there do not seem to be any phonological reasons governing the choice of the shape of the suffix.
B. Tone of Type II Indefinite Suffixes

The two Type II Indefinite Suffixes share the same tonal behaviour and thus seem to have the same underlying tone. There are several factors that contribute to the tonal changes of the suffix. First of all, the tone of the noun root does affect the tone of the suffix. Secondly, the segmental changes on the suffix affect the way tone is linked to the word. Finally, it will be seen that the segmental nature of the suffix actually contributes to tonal change of the noun root. The interplay of these three factors can create a rather complicated tonal situation. The following is an attempt to discuss each separately and also in conjunction with the other factors.

1. Tonal Behaviour of the Suffix

Let us first examine how the tone of the noun root affects the tone of the Type II suffix. Basically, if the root is Low tone, the suffix tone is Mid. If the root is High, Mid, or Low-High, then a High-Mid shape generally evolves. After Mid-Low roots the tonal shape of the word is Mid-Low-Mid\(^6\). In the chart below, the singular form of each noun is also given, under the label, Type I. The singular form of the nouns give a clearer idea of the underlying tone of the noun root:

(41) Root tone Type I Type II English
    a. Low pù-lô, pō-xîlo 'body, bodies'
    b. Low-High gbôn-lô, gbôn-xêlo 'granary, granaries'
    c. Mid gba, gba-ála\(7\) 'river, rivers'
    d. High mgbí-nê, mgbí-néle 'bamboo mat, bamboo mats'
    e. Mid-Low já, ja-àla\(8\) 'son, sons'
In observing the examples in (41) one discovers that the only environment in which a High-Mid tonal shape is not found is when the final tone of the root is Low tone, in which case the tone of the suffix is Mid tone. If an underlying High-Mid suffix is posited, then a rule lowering a High tone to Mid tone must be sought. In Chapter 2, a rule spreading Low tone onto a following High tone was proposed, which in certain cases, resulted in a Low-High contour simplifying to Mid tone. This same Low tone Spread rule (33) can be used here. Consider the example, pò-xilo (41a). If the underlying suffix tone is High-Mid, Low tone can then be motivated to spread onto the High tone of the suffix, as shown in the derivation below.

\[
\text{(42) pò-xilo} \rightarrow \text{pò-xâlo} \rightarrow \text{pò-xilo} \quad \text{`bodies'}
\]

\[
\begin{array}{c|c|c}
\text{L} & \text{H} & \text{M} \\
\end{array}
\]

L SPREAD

The lack of High tone in (41e) can also be explained by the application of the Low Spread rule.

The noun gbôn-xâlo (41b) appears to have a Low tone on the noun root. However, a look at the tone of the root in its singular form reveals a Low-High tone. The resulting surface pattern can be explained if we apply the High Delinking rule (37) proposed in Chapter 2, where the High tone of a Low-High contour is delinked if it is followed by another High tone. The application of this rule is illustrated below.

\[
\text{(43) gbôn-xâlo} \rightarrow \text{gbôn-xâlo}
\]

\[
\begin{array}{c|c|c}
\text{LH} & \text{H} & \text{M} \\
\end{array}
\]

H DELINKING
2. Segmental Deletion and Tonal Behaviour

Segmental deletion of the suffix complicates the analysis somewhat, however, in that some of the suffix tone is linked to segments of the noun root. This may be confusing when trying to determine the distinction between the underlying tone of the noun root and the tone of the suffix. The following discussion will help to clarify these ambiguities and will also attempt to establish a formulation for linking tones to nouns with partially deleted indefinite suffixes.

The chart below provides examples of what happens when the various tones of the noun roots meet up with the various segmental types of suffixing. Since the number of TBU’s on the root is a factor affecting the tonal behaviour, examples of noun roots with single TBU’s and double TBU’s are given. An asterisk indicates that there are no acceptable examples for that particular category, while a dotted line indicates that while it is conceivable that there exists an example, no example has been found to date. In addition, this chart shows that some noun roots are lowered to Low tone in certain environments. This phenomenon will be discussed later in the chapter. These lowered noun roots are marked in bold.
### Chapter 3 - The Noun

<table>
<thead>
<tr>
<th>(44) Tone</th>
<th>#TBU</th>
<th>Full Suffix</th>
<th>SuF Ini Del</th>
<th>SuF Fin Del</th>
<th>SuF RED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>1TBU</td>
<td>pò-xīlo</td>
<td>cò-o-lo</td>
<td>ñmè-è-ñi ncà-a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'bodies'</td>
<td>'nets'</td>
<td>'corners'</td>
<td>'sheep'</td>
</tr>
<tr>
<td></td>
<td>2TBUs*</td>
<td>kīrī-le</td>
<td>jèrè-ñi</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'countries'</td>
<td>'breasts'</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Low-High</strong></td>
<td>1TBU</td>
<td>gbòn-xēlo</td>
<td>---------</td>
<td>mpù-ú-ñi</td>
<td>fù-un</td>
</tr>
<tr>
<td></td>
<td></td>
<td>'granaries'</td>
<td>'hill'</td>
<td>'peanuts'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2TBUs*</td>
<td>māré-la</td>
<td>pálé-mi</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'elephantiasis'</td>
<td>'bucket'</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mid</strong></td>
<td>1TBU</td>
<td>la-xēla, là-xīla</td>
<td>gbaála</td>
<td>sc-é-ñi</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'pregnancies'</td>
<td>'rivers'</td>
<td>'stings'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2TBUs*</td>
<td>calé-la</td>
<td>---------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'pigs'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weak Mid</strong></td>
<td>1TBU</td>
<td>fò-ʔīlo</td>
<td>---------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'debts'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mid-Low</strong></td>
<td>1TBU</td>
<td>ci-xūle</td>
<td>ja-à-la</td>
<td>ni-i</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'thighs'</td>
<td>'sons'</td>
<td>'mothers'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2TBUs*</td>
<td>njirè-le</td>
<td>ku-ù-ñi</td>
<td>fè-e</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'tongue'</td>
<td>'roads'</td>
<td>'chiefs'</td>
<td></td>
</tr>
<tr>
<td><strong>High</strong></td>
<td>2TBUs*</td>
<td>mgbínè-le</td>
<td>---------</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'bamboo mat'</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>High-Mid</strong></td>
<td>2TBUs*</td>
<td>fyáa-la</td>
<td>céré-mi</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>'fish'</td>
<td>'orphans'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the discussion of Type I Indefinite noun tone, it was suggested that the Type I indefinite suffix be added to the noun root before the application of the
CHAPTER 3 - THE NOUN

Association Conventions, so that the final tone of the root could link directly to the toneless suffix. Type II suffixation can also take place before the application of the Association Conventions. The crucial question to be asked here is, however, should segmental deletion also take place before the application of the Association Conventions? For many cases, this is a very practical approach for assigning the correct tones to segments. After the deletion of the various segments, it is a simple matter to link the tones from right to left in a one to one fashion across the word. High, Low-High, and Mid tone nouns are especially amenable to this approach, as shown in the rule derivations below.

(45)a. High tone root - suffix undergoes Suffix Initial Deletion

\[ mgbíné - CVlV \rightarrow mgbíné - \text{le} \rightarrow mgbíné - \text{le} \rightarrow mgbíné\text{le} \ `\text{bamboo mats}' \]

\[ \begin{array}{c}
\text{H} \ H \ M \\
\text{SUF INI DEL AC (ASSOCIATION CONVENTIONS)}
\end{array} \]

b. 2 TBU Mid tone root - suffix undergoes Suffix Initial Deletion

\[ \text{calš} - CVlV \rightarrow \text{calš} - \text{le} \rightarrow \text{calš} - \text{la} \ `\text{pigs}' \]

\[ \begin{array}{c}
\text{M} \ H \ M \\
\text{SID AC}
\end{array} \]

c. 1 TBU Mid tone root - suffix undergoes Suffix Final Deletion

\[ \text{sc- \eta VlV} \rightarrow \text{sc- \eta i} \rightarrow \text{sc-\eta i} \rightarrow \text{sc-\eta i} \ `\text{stings}' \]

\[ \begin{array}{c}
\text{M} \ H \ M \\
\text{SFD V LENGTH AC}
\end{array} \]
TONAL ANALYSIS OF SENUFO: SUCITE DIALECT

CHAPTER 3 - THE NOUN

102

d. 1 TBU Low-High tone root - suffix undergoes Suffix Final Deletion

mpù -ηVlV -> mpù - ηi -> mpù u ηi -> mpùuηi -> mpùuηi 'hills'

```
LH H M LH H M LH HM LH HM LH HM
```

SFD V LENGTH AC H DELINKING

Note in (45d) that the rule of High tone Delinking also takes place, since, after the application of the Association Conventions, a Low and a High tone are linked to the same TBU and are followed by another High tone.

Low tone noun roots which have undergone Suffix Initial Deletion also conform easily to linking tone to segments after segmental deletion of the suffix. Note in the example below, that Low tone spread is triggered once the tones have been linked.

e. 2 TBU Low tone root - suffix undergoes Suffix Initial Deletion

kirè - CVlV -> kirè - le -> kirè-le -> kirè-le 'countries'

```
L H M L H M LH M LH M
```

SID AC L SPREAD

f. 1 TBU Low tone root - suffix undergoes Suffix Initial Deletion

cò - CVlV --> cò -lo --> cò -o- lo --> cò-o-lo --> còo-lo 'nets'

```
L H M L HM L H M LH M LH M
```

SID V LENGTH AC L SPREAD

Certain Low final nouns, however, have problems with applying the Association Conventions after segmental deletion. The derivations below show how such a rule ordering produces incorrect results.
CHAPTER 3 - THE NOUN

(46) a. 2 TBU Low tone root - suffix undergoes Suffix Final Deletion.

\[ \text{jèrè-} \text{-ni} \rightarrow \text{jèrè-} \text{-} \text{ni} \rightarrow \text{\*jèrè-} \text{-ni} \ `\text{countries}' \]

\[ \begin{array}{cclcl}
L & H & M & L & H & M \\
\end{array} \]

SFD \ AC \ L SPREAD

b. \text{cèn - mVlV} \rightarrow \text{ccn - mi} \rightarrow \text{cè-} \text{zn-mi} \rightarrow \text{cènmi} \rightarrow \text{\*cèzn-mi} `\text{antelopes}'

\[ \begin{array}{cclcl}
L & H & M & L & H & M & L & H & M & L & H & M \\
\end{array} \]

SFD \ LENGTHENING \ AC \ L SPREAD \ cènmi

c. \text{nca - CVlV} \rightarrow \text{nca- a} \rightarrow \text{\*ncaa} `\text{sheep, pl.'} \text{ Rather: ncàa}

\[ \begin{array}{cclcl}
L & H & M & L & H & M \\
\end{array} \]

SUF RED \ AC

d. \text{ja CVlV} \rightarrow \text{ja -la} \rightarrow \text{ja a la} \rightarrow \text{jàala} \rightarrow \text{\*jàala} `\text{sons'} \text{ Rather: jaàla}

\[ \begin{array}{cclcl}
ML & H & M & ML & H & M & ML & H & M & ML & H & M \\
\end{array} \]

SID \ LENGTH \ AC \ L SPREAD

All of these counterexamples consist of a Low final root; the application of AC after segmental deletions produces an incorrect Mid tone on the penultimate TBU, rather than the appropriate Low tone. It might be suggested that the correct surface form could be arrived at by using a High Delinking rule after Low tone spread, as shown below.

(47) \text{jèrè-} \text{ni}

\[ \begin{array}{cclcl}
L & H & M \\
\end{array} \]

The problem with this proposal, however, is that there is already a High Delinking rule (37), which works in a very restricted environment. The rule stipulates that a
High of a Low-High contour is delinked if it is followed by a High tone (See Chapter 2, p.54) as shown in (48a) below. It was also shown that before Low and Mid tones the High of a Low-High contour was prohibited from delinking (48b).

(48) a. wu ya xé kààn ñúú 'He is giving it to him'
   \[\begin{array}{cccc}
   M & M & H & LH \\
   \end{array}\]

   b. wu ya xá kàan la 'Is he giving it?'
   \[\begin{array}{cccc}
   M & M & H & LH \\
   \end{array}\]

Therefore, if one tried to motivate High Delinking in the setting illustrated in (47) above, this attempt would contradict the restrictions set for the High Delinking rule.

If, however, the Association Conventions applied before segmental deletion, the correct surface forms would be produced for the examples below.

(49)a. kàrà-ŋVlV -> kàrà-ŋi -> kàrà-ŋi
   \[\begin{array}{cccc}
   L & H & M & L & H & M \\
   \end{array}\]

   AC SFD L SPREAD

b. cêñ - mVlV -> cêñ - mi -> cêñ-mi -> cêñmi -> cêñ-mi 'antelopes'
   \[\begin{array}{cccc}
   L & H & M & L & H & M & L & H & M \\
   \end{array}\]

   SFD LENGTHENING L SPREAD

c. nca - CVlV -> nca- a -> nçàa 'sheep, pl.'
   \[\begin{array}{cccc}
   L & H & M & L & HM & LH & M \\
   \end{array}\]

   AC SUF RED L SPREAD
Since ordering AC before Segmental Deletions seems to work so well in these cases, let us test this ordering on other Type II nouns. In general, if tones are linked before segmental deletion, once segmental deletion and subsequently, vowel lengthening take place, there are free tones and TBU’s that will require linking. Although the manner of linking is definitely predictable, the rules needed to motivate correct linking are not immediately clear and the tonal and morphological situation is complex.

One reason for the complexity of tonal patterns is the morphological nature of the suffixes. Nouns which have undergone SID link their tones in a slightly different way than nouns which have undergone SFD. In addition, Mid tone nouns which have undergone SFD, behave in a different way than SFD Low tone nouns. Finally, it is noted that patterns isolated for the previous groups of nouns are violated by certain nouns whose root tone is a contour tone.

The analysis below attempts to account for these varying behaviours. It should be noted that High-Mid and High-Low nouns have been excluded from this present analysis because of their somewhat unpredictable behaviour. A description of their behaviour will be given following the analysis.

Let us first consider those nouns which have undergone Suffix Initial Deletion. Below are examples of nouns which have already undergone SID and Vowel Lengthening but have not yet had tones and TBU’s relinked. The final surface form is given alongside each example.

(50) a. gba-a-la -> gbaála `rivers’
   M  H  M
   b. calš- la -> caléla `pigs’
   M  H  M
   c. kirš- le -> kiršle `countries’
   L  H  M
d. co-o-lo -> còolo `pots’
   L  H  M
   e. mgbinš- le -> mgbínéle `bamboo mats’
   H  H  M
In each case, we must deal with a high tone which has lost the segment to which it was linked. In the examples (a) and (d), an extra TBU has been created through Vowel Lengthening. Since both a free tone and a free TBU are found adjacent to each other, the Association Conventions can be reapplied at this point, linking the two.

(51) gba-ála
     \[ \begin{array}{c}
       \text{M} \\
       \text{H} \\
       \text{M} \\
     \end{array} \]

The other examples have no free TBU's, however. Judging from the final output of all of the examples, it is clear that High tone does not link to the final TBU. All final TBU's are linked only to a Mid tone. In (50b) there is clear evidence that the High tone is linked to the second TBU. The derivation below shows that the Mid tone must also be delinked from the second TBU in order to simplify the Mid-High contour.

(52) calé-la
     \[ \begin{array}{c}
       \text{M} \\
       \text{H} \\
       \text{M} \\
     \end{array} \]

At this point, I will not discuss the rule of Mid tone Delinking except to note the M, being on the left side of the contour delinks from a TBU linked to High when it already linked to the preceding TBU.

(53) MID TONE DELINKING:

\[ \begin{array}{c}
   \text{X} \\
   \text{X} \\
   \text{H} \\
   \text{M} \\
\end{array} \]
The surface form of the example in (50c) does not show a High tone on a second TBU, but rather a Mid tone. This can be explained if the free High tone is linked to the second TBU and the Low tone is not delinked, as shown below:

\[(54) \quad \ddot{ki}r\ddot{a} - le\]

[diagram]

Recall that in Chapter 2 a Low-High contour which was created by means of a Low tone spreading onto a High tone, simplified to a Mid tone on the surface.

In the example in (50d), the High tone is linked to the free second TBU by the universal principle of tone Association. The final surface Mid tone on that TBU can be explained by triggering Low tone to spread onto the High tone TBU, as shown below:

\[(54) \quad \ddot{c}o\ddot{o} - o\ddot{lo} \rightarrow \ddot{c}o\ddot{o} o\ddot{lo}\]

LOW SPREAD

Finally, the free High tone of the example in (50e) can also be linked to the second TBU, though in this case, the linking is hardly necessary, since there is already a High tone from the noun root linked to it.

\[(55) \quad mgbi\ddot{n}\ddot{a} - le\]

All five of these examples, then, undergo a process where the free High tone links to the second TBU. Since this is not, in all cases, predictable by way of the Association Conventions, a rule must be formulated, specifying the linking. In attempting to formulate a rule, one may pose a question as to why the free High tone links to the left rather than to the right. It has been suggested in the
literature (obtained through personal communication with C. Kisseberth) that tone will gravitate in the direction of the trigger of the segmental deletion rule. In this case, the left syllable of the suffix was deleted. As a result, the preceding TBU shoulders the responsibility of carrying the TBU of the suffix. Taking into consideration these observations, then, the rule can be stated as follows:

(56) SUFFIX HIGH LINKING: Link the free High tone of the Type II suffix to the first TBU to the left. 

\[
\begin{array}{c}
X \\
\text{H} \\
\end{array}
\begin{array}{c}
X \\
\text{M} \\
\end{array}
\]

The second set of nouns to discuss are those which have undergone Suffix Final Deletion. In these particular examples (57), it is the Mid tone rather than the High tone which loses its segment. Unlike the High tone of the previous examples, the Mid tone here has no choice of segments to link to, and thus it links to the same segment as the High tone.

(57) a. sc-ε-ŋi -> scɛŋi `stings'

\[
\begin{array}{c}
\text{M} \\
\text{H} \\
\text{M} \\
\end{array}
\]

b. ŋme-e-ŋi -> ŋmɛɛŋi `corners'

\[
\begin{array}{c}
\text{L} \\
\text{H} \\
\text{M} \\
\end{array}
\begin{array}{c}
\text{L} \\
\text{H} \\
\text{M} \\
\end{array}
\]

c. jiru-ŋi -> jɛɛ-ŋi `breasts'

\[
\begin{array}{c}
\text{L} \\
\text{H} \\
\text{M} \\
\end{array}
\begin{array}{c}
\text{L} \\
\text{H} \\
\text{M} \\
\end{array}
\]

We know, however, that the final output does not allow a HM contour on the final TBU, so somehow, the High tone must be delinked from the final TBU. The surface forms of examples (a) and (b) show that High tone of the suffix ends up on the
final TBU of the noun root. This can be explained by way of positing a rule labeled
High tone Shift, stated as follows:

(58) HIGH TONE SHIFT: Given that `shift' means delinking a tone from one TBU and
relinking it to an adjacent TBU, shift a High tone of a Type II suffix linked to
the same TBU as a Mid tone of the suffix, to the final TBU of the noun root (i.e.
the second TBU of the word).

\[
\begin{array}{c}
\text{X]} \quad \text{X} \\
\text{H M} \\
\text{H M}
\end{array} \rightarrow \text{X]} \quad \text{X} \\
\text{H M} \\
\text{H M}
\]

Such a rule then, can be applied to the noun given in (57a) above, as follows:

(59) a. së-e-ŋi \(\rightarrow\) sëŋi `stings'

\[
\begin{array}{c}
\text{M} \\
\text{H M}
\end{array} \rightarrow \text{H SHIFT}
\]

Before jumping to the possible conclusion that this proposed High Shift rule and
the Suffix High tone Link rule (56), which links a free High tone to the TBU on the
left, can be generalized into one single rule formulation, the reader is asked to
consider the examples in (57b) and (57c). In these examples, it is clear that High
tone does not shift to the preceding TBU. What might be the reason for this? One
thing these two examples have in common is that they both have a Low tone noun
root. Instead of allowing Tone Shift, it appears that these two nouns trigger the
Low tone to spread onto the following High tone suffix, as shown in (60) below.

(60) nmê-ë-ŋi

\[
\begin{array}{c}
\text{L} \\
\text{HM}
\end{array} \rightarrow \text{HM}
\]

jërë-ŋi

\[
\begin{array}{c}
\text{L} \\
\text{HM}
\end{array} \rightarrow \text{HM}
\]
Once this happens, the Low and High are simplified to Mid tone, with the final output remaining an acceptable Mid tone.

One way to prevent High tone Shift from taking place on these Low tone nouns is to order the High tone Shift rule after Low tone Spread. If Low tone Spread occurs, as in (60) above, there are two reasons for the High tone not to shift: 1) the simplified Low-High tone linked to the same TBU results in a surface Mid tone and thus, since there is no surface contour tone, there is no reason for the High tone to shift; and 2) High tone cannot, by virtue of the well-formedness condition which states that the Association lines cannot cross, link to the preceding TBU without crossing the Association line linking the Low tone to the final TBU.

If the High tone Shift rule must take place after Low tone Spread and the Suffix High tone Linking rule (56) takes place before Low tone Spread, as was illustrated in (54), then it becomes clear that it is theoretically not viable to try to make one rule formulation for the two processes.

Nouns that undergo Suffix Reduction do not produce any additional complications for analysis. When a suffix is reduced to a single vowel, the only tone allowed on the root is Low tone. In the example below (61), we see the Low tone spreading onto the following High tone, creating a Low-High contour tone which simplifies to Mid tone:

\begin{verbatim}
(61) ncà-a
\end{verbatim}

The rules posited so far, however, still do not cover all examples in the data. We have purposely left the nouns with contour tones until last. The two most common contour tones found on nouns are Low-High and Mid-Low. Low-high nouns do
not pose a problem for the analysis, as given thus far. In the first example below, High Linking takes place once the initial part of the suffix is deleted, while in the second example, High Shift takes place after Suffix Final Deletion.

(62) \text{maré} - CVlV -> \text{màré} - la -> \text{maré-la} \quad 'elephantiasis'

\begin{verbatim}
L H M
\text{AC}
\text{SID}
\text{H LINK}
\end{verbatim}

\text{pàlé} - mVlV -> \text{pàlé} - mi -> \text{pàlé-mi} \quad 'pail'

\begin{verbatim}
L H M
\text{AC}
\text{SFD}
\text{H SHIFT}
\end{verbatim}

The following Low-high noun (63) has only one TBU in the root. Vowel Lengthening after SFD creates an additional TBU, which acquires a High tone after High tone Shift. A Low-High contour followed by another High then triggers the High Delinking rule, introduced in Chapter 2.

(63) \text{mpù-u-ŋi} -> \text{mpù-ú-ŋi} \quad 'hills'

\begin{verbatim}
H SHIFT
\text{H DELINKING}
\end{verbatim}

The following Mid-Low noun (64), causes problems, however. Since it undergoes SID, one might expect High tone Linking to occur, after which Low tone Spread would place take place. This unfortunately would result in the incorrect surface tone of ML-M-M.
(64) ja-a-la ->*jaà-la `sons' Rather: jaàla

H LINK L SPREAD

It is conceivable to suggest that single TBU noun roots with contour tones are exceptions to the stated rules. Let us suggest then, that if a contour tone (linked to a single TBU) is followed by a free TBU, the relinking of the second tone of the contour to the following TBU takes precedence over any other linking possibilities. Let us call this rule the Contour Shift rule (C Shift)

(65) CONTOUR TONE SHIFT:

Given that `shift' means delinking of a tone and linking it to an adjacent TBU, the second tone of a contour tone linked to the same TBU shifts to any free TBU to the right.

T₁ T₂
T₁ T₂
T₁ does not equal T₂

This rule is not part of the Association Conventions. It is a rule that allows for the relinking of contour tones for the purposes of simplifying the contour and giving each tone its TBU. Below is an example of a derivation using the C Shift rule.

(66) jà - CV1V -> jà - la -> jà a la -> ja à la -> ja à la

AC SID V LENGTH C Shift L SPREAD

Since the second tone of the contour is now linked to the second TBU, one may
wonder to which TBU the free High tone of the suffix may be linked. If the High tone Link rule is allowed to operate after the C Shift rule, there is nothing to keep it from linking to the second TBU, too. This, unfortunately would yield an incorrect surface form: *jaala.

Therefore, High Linking must be prevented from linking after the C Shift rule. If instead, it occurred before C Shift, High Linking would incorrectly eliminate the environment for the C Shift rule: *jaala.

We see, then, that High tone linking can be allowed neither before or after the C Shift rule, but rather, when the C Shift rule applies, it excludes the right for High tone linking to apply, even though the conditions for rule application, outlined in the formulation of the High Linking rule, are met. As a result, in order to predict a correct output, an additional condition will have to be inserted into the formulation of the rule. Below is a restatement of the rule (56) with the new condition.

(67) SUFFIX HIGH LINKING: Link the free High tone of the Type II suffix to the first TBU to the left, on condition that the Contour linking rule has not already linked a tone to that TBU.\textsuperscript{10} \begin{tabular}{c|c}
10 & X & X \\
\hline & H & M \\
\end{tabular}

The free High tone of \textit{jaàla}, then is not allowed to link to the second TBU through the High Linking rule. The only options left to it are 1) to link to the final TBU, at which point, the Low tone Spread rule would be triggered, spreading the Low tone onto the High tone, thus creating a Low-High Contour which simplifies
to Mid tone (see (68a)) or 2) not to link at all (see (68b)). In either case, the correct surface form would result. My preference is to link the High tone, if possible, since in general, the High tone tends to be linked to at least some TBU.

(68) a. jaàla
   \ML HM
   LOW SPREAD

b. jaàla
   \ML HM

The other contour tone word in this data sample poses no problems for this new C Shift rule. Below is a derivation of mpùuŋi.

   LH H M LH HM LH HM LH HM
   AC SFD & V LENGTH C SHIFT H SHIFT

The behaviour of suffixed High-Mid nouns is somewhat problematic. When SUFFIX FINAL DELETION occurs, two possible shapes surface: HHM or HMM. The former is more frequent.

(70)a. HHM
   vënlu vënmi ‘crickets’
   céréŋc cérémi ‘orphans’
   séŋéŋc séŋégi ‘palm nuts’

b. HMM
   tùu tùumi ‘caterpillars’
   ŋjééne ŋjéégi ‘stone’
When SUFFIX INITIAL DELETION takes place, again both HHM and HMM are possible tonal shapes of the noun, though in this case, the latter is more frequent.

(71)a. HMM

fyáa fyáala 'fish'
kélu kéelɔ 'monkey'
sónlu sónl̲lu 'parakeets'

b. HHM

mpúlu mpúlélo ?' 'spiders'
kónlɔ kólélo 'beads'

What is happening here is that two High Mid sequences are vying for the three available TBU's. Possible reasons for a lack of an adequate analysis are 1) the tonal nature of Mid tone in a High Mid noun root is unknown, 2) lack of accurate transcription, 3) arbitrary, lexical exceptions, or 4) simply free variation on the part of the speakers.

The two High-Low nouns in the data sample behave differently from each other. One optionally maintains the Low final root tone, the other does not.

(72) a. jô jólolo 'pockets'

b. sûlɔ sûxelo, sûxelɔ11 'floors'

It should be noted that since all High and High-Mid tone nouns possess two TBU's, they are all either subject to Suffix Final or Suffix Initial Deletion. There are no instances where the entire suffix has been retained or reduced.

* *Accuracy of tone transcription uncertain.
In summary, then, it has been established that the Association Conventions must apply before the segmental deletion rules. As a result, several new rules are required to provide for the relinking of freed TBU's or tones. According to the discussions above, it has been seen that these rules apply in the following order: Association Conventions
Segmental Deletions: Suffix Initial Deletion, Suffix Final Deletion, Suffix Reduction
Vowel Lengthening
(65) Contour tone Shift OR (67) Suffix High Linking
(33) Low tone Spread (Ch.2)
(53) Mid tone Delinking
(58) High tone Shift
(37) High tone Delinking (Ch.2)

3. Root tone lowering (High Deletion)

One item that complicates the analysis of the tonal behaviour of nouns with Type II suffixes somewhat is the frequent lowering of the tone of noun roots when the suffix is added. All types of Mid initial nouns as well as Low-High nouns can also be subject to root tone lowering, while High initial noun roots never lower. Below are examples of nouns with lowered root tone:

(73) Underlying Type I Type II
Root Tone
Mid nci-le nci-xule `balaphon, balaphons'
Weak Mid fo-lo fò-?olo `debt, debts'
Mid-Low ti-dè tèr-ile `liana, lianas'
Low-High nkàn-lá nkàn-?ala `tooth, teeth'
In order to analyze the behavior of Root tone Lowering, both the tonal and segmental environment must be considered. It will be noted in the following discussion that a High tone suffix seems to play a role in the root tone lowering of both nouns and verbs. In addition, examination of the data reveals that root tone lowering is most common on nouns with either full or reduced Type II suffixes, while very little root tone lowering occurs on nouns with partially deleted suffixes (i.e. those which have undergone either Suffix Initial or Suffix Final Deletion).

Let us first consider the types of tones which have a tendency to lower to Low tone and attempt to determine whether an underlying generalization can be made about them. The examples above in (73) indicate that Mid, weak Mid, Mid-Low and Low-High nouns can all undergo root tone lowering. One possible way to motivate the lowering of the Low-High tone to Low tone is to simply posit a High deletion rule: H -> 0. When the High tone is deleted, the Low tone remains. In Chapter 2, it was proposed that Mid tone verbs were underlyingly Lh, that is, they possessed a Low tone on the primary tier, while being specified on the subregister tier for High tone. It was suggested, there, that Mid tone verbs were lowered to Low tone through the process of subregister High tone deletion: h -> 0. The application of this rule then resulted in a remaining Low tone on the primary tier. If the Mid tones of weak Mid, Mid, and Mid-Low nouns could all be posited as possessing a Low tone on the primary tier and a High tone on the subregister tier, the rule of subregister High tone deletion could also effectively apply to each of these tones to produce a Low tone. It must be noted, however, that at this point, the underlying tone of Mid tone nouns has not been analyzed; therefore the hypothesis here remains tentative until a thorough investigation of Mid tone nouns is made in Chapter 5.
Assuming that the hypothesis is correct, however, we see that the lowering of both Low-High and Mid initial nouns can be triggered by a High Deletion rule for the former the deletion of the High tone on the primary tier, while the second set undergoes the deletion of the subregister High tone. Since these two processes parallel each other in behaviour, let us propose a single rule to cover for both, labeled simply, the High Deletion rule.

This High Deletion rule will not only indicate that the High tone to be deleted can be on either tier, it must also indicate another fact that all of these proposed underlying tones have in common, namely a Low tone. In all cases, a Low tone is found on the primary tier either adjacent to a primary tier High tone or linked by a High tone on the subregister tier. With this information, the following rule is proposed:

\[(74) \text{HIGH DELETION: Delete a High tone on the primary or subregister tier if a primary Low tone is found to the left of a primary High tone or linked to a subregister High tone.}\]

\[
\{H, h\} -> 0 / L \begin{array}{c|c}
L & \hline
\end{array}
\]

The examples given below show how this rule would work:

(75) LH: nka -ñaña
M: nci-xéle
ML: tiréle
Once the root tone is lowered to Low tone, its tonal behaviour is identical to that of underlying Low tone roots in that the Low tone of the root spreads onto the High tone of the Type II suffix, as shown in the example below.

(76)  nci - xéle -> nci - xéle -> nci - xle  `balaphons'

\[
\begin{array}{cccc}
L & H & M & L \\
\hline
h & & & \\
\end{array}
\]

AC  H DELETION  L SPREAD


\[
\begin{array}{cccc}
\cdot & H & M & \cdot \\
\hline
L & H & M & L \\
\end{array}
\]

AC  HIGH-DELETION  L-SPREAD

Since High Deletion does provide the environment for Low tone Spread, it must then be ordered before the Low tone Spread rule. This rule ordering is in contrast to the High Delinking rule introduced in Chapter 2, where a Low tone Spreading onto a High tone TBU contributes to the environment needed for High Delinking. Recall that when an incompletive suffix has been subject to Low tone spreading, the High tone is delinked if it is followed by a High tone noun class clitic, as is shown in the example below:

(78)  wu ya xé kà-an þúù -> wu ya xé kà-àn þúù  `He is giving it to him'

\[
\begin{array}{cccc}
M & M & H & L \\
\hline
L & H & H & M \\
\end{array}
\]

LOW SPREAD  HIGH DELINKING

The two examples given below, have the same underlying tonal shapes. Yet one undergoes High deletion (a), while the other, for unknown lexical reasons, is
exempt from High Deletion. Instead, it undergoes High Delinking (b).

(79)a. nkàn - əála --> nkàn - əála --> nkà - əála --> nkà - əala 'teeth'

\[\text{HIGH-DELETION} \quad \text{L-SPREAD}\]

b. gbôôn -xêlo --> gbôn -xêlo 'granary'

\[\text{H DELINKING}\]

These two rules clearly yield different results. In the first, the final output is LMM while in the second, it is LHM. If High Deletion were ordered after Low tone spread, the derivation would yield the same results as High Delinking, illustrated in (79b) above. In this set of examples, then, the primary difference between High Delinking and High Deletion is where they are ordered in respect to Low tone Spreading. High Deletion takes place at a lexical level of the derivation, whereas High Delinking can take place at both the lexical and the phrasal level.

The above discussion has centered around how the tonal nature of Mid initial and Low-High tones can contribute to the phenomenon of root tone Lowering, now known as High tone Deletion. There are, however, environmental factors, both tonal and segmental, which also seem to be present when the root tone of the noun is lowered to Low tone. The following discussion will examine each of these factors in an attempt to determine whether they should be considered in the formulation of the High Deletion rule.

Let us consider first the tonal environment for the High Deletion rule. High Deletion occurs on nouns when the noun root is followed by a High initial Type II
suffix. When one recalls that High Deletion on verb roots also takes place when followed by the High tone incompletive suffix as in (80), one begins to suspect that perhaps a High tone suffix is a crucial factor in the application of High tone deletion.

(80)  ka- án --> kà-án --> kà-an  `give - incompletive'
       L   H      L H       L  H
              h

H-DELETION  L-SPREAD

The proposed revision of the rule would then include the stipulation that High Deletion takes place when followed by a High tone suffix, as shown below:

(81) HIGH DELETION: Delete a High tone on the primary or subregister tier if a primary Low tone is found to the left of a primary High tone or linked to a subregister High tone, and followed by a High initial suffix.

{H,h} -> 0 / L ___ + H
       \   \   \ [suffix]
        \   \   \   [L]

Note again that the environment for High tone deletion is surprisingly similar to that required for High delinking. In both cases, the High tone is deleted or delinked when followed by another High tone. As mentioned above, however, High Deletion is limited to applying at the word level, while High Delinking can take place across word boundaries and the two are ordered differently with respect to Low Spread.

Examination of the data shows that not all words with Mid initial or Low-High tones are subject to High deletion when followed by the High initial Type II
suffix. Either the choice for High Deletion is primarily arbitrary or else there is another environmental factor to take into consideration. The data given on the following pages shows that the segmental environment seems to play a role in determining which Mid initial and Low-High tones are subject to High Deletion.

It was noted in the introduction to this section that Root tone lowering (now high Deletion) occurs almost without exception on nouns with reduced suffixes and on nouns with full suffixes, while tone lowering is less likely on nouns with partially deleted suffixes. The three subsections below describe (a) Tone lowering with Reduced Suffixes, (b) Tone lowering with full suffix and (c) Partial Suffix Deletion and resistance to tone lowering.

a. High Deletion with Suffix Reduction

When a Type II class suffix undergoes Suffix Reduction, the root tone is always Low tone. Any Mid, weak Mid, Mid-Low, or Low-High nouns which undergo Suffix Reduction are also subject to High Deletion.

(82) Mid-Low

<table>
<thead>
<tr>
<th>Class 1</th>
<th>Class 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. nô</td>
<td>ni-i</td>
</tr>
<tr>
<td>b. pôn</td>
<td>pù-un</td>
</tr>
<tr>
<td>c. tô</td>
<td>ti-i</td>
</tr>
<tr>
<td>d. ceewè</td>
<td>cè-e</td>
</tr>
<tr>
<td>e. folò</td>
<td>fè-e</td>
</tr>
</tbody>
</table>

Mid-Low

<table>
<thead>
<tr>
<th>Class 5</th>
<th>Class 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>f.nyelè</td>
<td>nyi-i</td>
</tr>
</tbody>
</table>

Weak Mid Class 6 No Suffix Reduction
Both Cebara and Supyire experience root tone lowering on Mid Low nouns which have reduced suffixes. Interestingly, Mills (1984) and Carlson (1980) have chosen the same examples to illustrate this lowering. Root tone lowering (High Deletion) also takes place in the Sucite cognates of these words, as seen below:

(a) Cebara Supyire Sucite English
   a. pûûn, pûûn ppun, ppû-un pûn, pûun 'dog, dogs'
   b. coloû, càbala cee-we, ci-e ce-wè, cèe 'woman, women'
   c. sikaà, sikàala sika, sikxà-a sikà, sikàa 'goat, goats'

The latter example is compound in structure. In compounds, only roots in contact with the suffix are susceptible to tone lowering. Carlson (1980) states that in Supyire, most of the Mid Low nouns experience Root tone lowering. Mills (1984) calls root tone lowering "irregular", but states that many "lîi class and some wii class nouns" acquire a Low-Mid pattern, without identifying the original tone of the root. Her examples show High, Mid, and Mid-Low noun roots that have experienced tone lowering.
b. High Deletion with Full Suffix

High Deletion also tends to occur on noun roots with the full suffix.

(84) Mid-Low Class 6

a. cilè  ci-xule  `thigh, thighs'

Weak Mid Class 6

b. ƞmolo  ƞmò-ʔolo  `knife, knives'

c. folò  fò-ʔolo  `debt, debts'

Mid Class 6

d. ncile  nci-xule  `balaphon, balaphons'

e. lala  là-xula, la-xála  `pregnancy, pregnancies'

f. ƞṃala  ƞmà-ʔala  `bud, buds'

g. pelè  pè-xulè  `bowl, bowls'

Low-High Class 6

h. lùlò  lò-xulò  `shea nut, shea nuts'

i. nkànlà  nkàn-ʔunla  `tooth, teeth'

exception: j. gbònlò  gbön-xulò  `granary, granaries'

All weak Mid nouns (except for a couple of possible contradictory cases) take the full indefinite suffix and all of them undergo High Deletion. There are no weak Mid Class 2 nouns. Cebara has one example, in its list of irregular plurals, of a cognate of a Sucite weak mid noun which lowers when a Class 2 suffix is added:

(85) Cebara Sucite English

ƞmolo, ƞmòʔolo  `knife, knives'
It is not known if there is a tonal category of nouns in Cebara which corresponds to the 'weak Mid' category of Sucite. Weak Mid nouns do exist in Supyire. In fact, it was Carlson who introduced the term Weak Mid. Of the few Weak Mid examples that Carlson provides, only one one did not undergo root tone Lowering.

(86) Supyire

<table>
<thead>
<tr>
<th>Class</th>
<th>Class 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>fya</td>
<td>fyà-a</td>
<td>'fish, pl.'</td>
</tr>
<tr>
<td>shin</td>
<td>shi-in</td>
<td>'persons'</td>
</tr>
<tr>
<td>sën-ë</td>
<td>séŋ-ii</td>
<td>'stings'</td>
</tr>
<tr>
<td>la-a</td>
<td>là-hii</td>
<td>'pregancies'</td>
</tr>
</tbody>
</table>

c. Partial Suffix Deletion and Resistance to High Deletion

It has also been observed that when a suffix has undergone either Suffix Initial Deletion or Suffix Final Deletion, the noun roots are less likely to undergo High Deletion. In the examples below, the few nouns which do undergo High Deletion are marked in bold.

(87)a. Mid-Low Class 2 nouns

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>jà</td>
<td>jaàla</td>
</tr>
<tr>
<td>siiën</td>
<td>siinlc</td>
</tr>
<tr>
<td>külë</td>
<td>külélc</td>
</tr>
</tbody>
</table>

b. Mid-Low Class 6 nouns

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kudò</td>
<td>ku(x)ùxi</td>
</tr>
<tr>
<td>njidè</td>
<td>njirèle</td>
</tr>
<tr>
<td>njedè</td>
<td>njèrèle</td>
</tr>
<tr>
<td>tidè</td>
<td>tèrèle</td>
</tr>
</tbody>
</table>
c. Mid Class 2 Nouns

gba  gbaála  'rivers'
fiin  fiínle, fiémi  'blind persons'
calou  caléla  'pigs, pork'
poru  porélo  'daughters'

d. Mid Class 6 Nouns

lede  lèrölę  'times'
nyenų  nyèèŋi  'horns'
tile  ti(x)éxi  'crests of cocks'
snêc  snëŋi, snëŋi  'stings'
ntide  nterélé  'bats'
mpudo  mporélo  'horn trumpets'

e. Low-High Class 6 Nouns

mgbiÖlê  mgbiÖiƒi  'threshing or beating sticks'
mpùloò  mpùu׃i  'hills'
ntàànlà  ntàànni  'baskets (tightly woven)'
fèrâ  fèrëla  'winnowing baskets'
pàlâ  pàlémi  'pails'

Previous to the discussion of the segmental environment, it was mentioned that High Deletion takes place before Low tone Spreading, so that the derived Low tone can also trigger Low tone Spreading. Now we need to examine the rule ordering of segmental deletions and High Deletion. In the above description it was assumed that High Deletion followed segmental deletion. However, before arguing for this rule ordering, let us take a look at the viability of ordering High Deletion before segmental deletions.
Most non-derived Low tone roots take partially deleted suffixes, while most derived Low tone roots take full or reduced suffixes. If High Deletion were ordered first, there would be no way to distinguish derived Low tones from Low tone roots, and thus no way to predict that the derived Low tone roots tend to opt for full or reduced suffixes, while underlying low tone roots prefer partially deleted suffixes. In addition, if High Deletion occurred first, deciding which Mid, Mid-Low, or Low-High tone root to lower to Low tone would be primarily an arbitrary decision.

On the other hand, ordering High Deletion after segmental deletion would bring some predictability to the rules. While the type of segmental deletion would be partially an arbitrary decision, once the deletions are made, High Deletion would be obligatory on any Mid initial or Low-High noun with a full suffix or a reduced suffix, and rare on such noun roots with partially deleted suffixes.

With the segmental Deletions rule ordered before High deletion, then, one can now use segmental information in the formulation of the High Deletion rule. The revised High Deletion rule given below in (88) would now include the information that High Deletion occurs on nouns with full or reduced suffixes. (88) HIGH DELETION: Delete a High tone on the primary or subregister tier if a primary Low tone is found to the left of a primary High tone or linked to a subregister High tone, and followed by a High initial suffix. If the suffix is a nominal suffix, it must have undergone either no segmental alteration or else have undergone Suffix Reduction.

\[
\{H,h\} \rightarrow 0 / \left[ L \quad L \right] + H
\]

\[
\left\{ \begin{array}{l}
L \\
\mid \\
\end{array} \right\} \quad \text{[suffix - if N, then full or reduced]}
\]
This rule may seem somewhat odd in that it includes not only tonal information but also segmental and morphological information as well. However, at this point, these are precisely the factors that seem to govern High tone deletion.

Below is a final example illustrating the ordering of High Deletion after segmental deletion and before Low tone Spread.

\[(89) \text{sò} - x\text{êlo} \rightarrow \text{sò} - \text{o} \rightarrow \text{sò} \text{ò} \rightarrow \text{sò} \text{o} \rightarrow \text{sò} \text{o}\]

This completes a lengthy discussion of the Type II indefinite suffix, which are found on the two plural noun classes, 2 and 6. We have seen that there are several factors affecting the tone of nouns with Type II indefinite suffixes. First of all, the tone of the root can alter the tone of the suffix. Specifically, the Low tone of the root can spread onto the High tone of the suffix. Secondly, the types of segmental deletions that take place not only help to determine how the remaining tones and TBU’s can be relinked; they can also play a role in triggering High tone deletion (or Root tone Lowering) of the noun root tone.

IV. THE DEFINITE SUFFIX

This section discusses the structure and tonal behaviour of the Definite suffix. Since the structure of the definite suffix of the Type I nouns is somewhat different from that of Type II nouns, they shall be discussed separately. Their tonal behaviour, however, is similar enough that it shall be discussed together in one subsection.
A. Structure - Type I

The Definite form of Type I nouns, that is, nouns which take the Type I indefinite suffix, is derived by replacing the indefinite with the definite suffix. In the chart below, the definite form of the noun is given beneath the indefinite form. Those nouns which have a 0 indefinite suffix are given in the first row, while, those with -CV and (N)CV suffixes are given in the succeeding rows.

<table>
<thead>
<tr>
<th>Suffix</th>
<th>1 (wi)</th>
<th>3 (ki)</th>
<th>4 (yi)</th>
<th>5 (li)</th>
<th>7 (ti)</th>
<th>8 (pi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>jà &lt;33&gt;</td>
<td>nà &lt;3&gt;</td>
<td>na-yà</td>
<td>0</td>
<td>0</td>
<td>juu &lt;2&gt;</td>
</tr>
<tr>
<td></td>
<td>jà-ŋe</td>
<td>nà-ke</td>
<td>nà-nyc</td>
<td></td>
<td></td>
<td>juubé</td>
</tr>
<tr>
<td></td>
<td>`son'</td>
<td>`fire'</td>
<td>`fires'</td>
<td></td>
<td></td>
<td>`speech'</td>
</tr>
<tr>
<td>CV</td>
<td>ce-wè &lt;1&gt;</td>
<td>tè-xè &lt;33&gt;</td>
<td>te-yè</td>
<td>ci-lè &lt;37&gt;</td>
<td>su-rù&lt;19&gt;</td>
<td>tt-be &lt;1&gt;</td>
</tr>
<tr>
<td></td>
<td>ceè-ŋe</td>
<td>tè-ke</td>
<td>tè-nyc</td>
<td>ciī-ne</td>
<td>sù-te</td>
<td>tt-bé</td>
</tr>
<tr>
<td></td>
<td>`woman'</td>
<td>`place'</td>
<td>`places'</td>
<td>`thigh'</td>
<td>`mush'</td>
<td>`medicine'</td>
</tr>
<tr>
<td>(N)CV</td>
<td>cëŋ-ŋe</td>
<td>wye-ŋè &lt;25&gt;</td>
<td>wye-yè</td>
<td>së-nè &lt;5&gt;</td>
<td>kòò-nò &lt;1&gt;</td>
<td>sù-mè &lt;10&gt;</td>
</tr>
<tr>
<td></td>
<td>wye-ŋe</td>
<td>wyèn-ŋe</td>
<td>wyèn-yc</td>
<td>së-nè</td>
<td>kòò-nde</td>
<td>sè-mbe</td>
</tr>
<tr>
<td></td>
<td>`antelope'</td>
<td>`leaf'</td>
<td>`leaves'</td>
<td>`sting'</td>
<td>`cotton'</td>
<td>`sorghum beer'</td>
</tr>
</tbody>
</table>

The Type I definite suffix is composed of a consonant indicating noun class and definiteness and a Mid front vowel. Generally, the consonants of the indefinite and definite suffix of the same noun class are at the same point of articulation, while the manner of articulation may vary. For example, the consonants in Classes 3 and 7 suffixes are converted from [-stop] to [+stop] (x -> k, r -> t). This contrasts with the dialectal variation found in some neighbouring villages (Koloko) as well as (to the west) across the border in Mali, where Classes 3 and 7 definite suffix consonants remain the same as those of the indefinite suffix.
(91) Kotoura Sucite

Dialectal variation

gba-xa, gba-ké (3)  ~  gba-xa, gba-xé  `the house'
su-rò, sù-te (7)  ~  su-ro, sù-re  `the mush (main dish)'

Noun stems with final nasals cause voicing of voiceless consonant suffixes of Classes 3 and 7:

(92) fuN ke (3)  -->  fuŋ-ge  `inside'

kòòN-te (7)  -->  kòn-de  `cotton'

Aside from the nasal influence of some noun roots, nasality seems to be a feature for the definite suffixes of Classes 1, 4 and 5. Instead of a [+stop] consonant replacing a [-stop] consonant, as is the case for Classes 3 and 7, a nasal consonant in the definite suffix is at the same point of articulation as its indefinite counterpart. This is illustrated below.

(93) Class  | Indefinite C | Definite C | Example | English
---|---|---|---|---
1  | w  | ŋ  | ce-wè, ce-ŋè  | `woman' |
4  | y  | ny | te-yë, tê-nye  | `places' |
5  | l  | n  | ci-lè, ci-ŋ-e  | `thigh' |

When a Class 5 noun is suffixed for definiteness, the vowel of the root is lengthened. It is possible, in this case, that the indefinite suffix was never totally deleted; with the addition of the definite suffix, the -l- dropped out, creating a long vowel\(^{12}\). In Supyire, this indefinite -l- never does show up on the surface.

(94) Sucite  Supyire

Indefinite  gbòn-lò  gbù-ùn  `granary'
Definite   gbòn-né  gbùn-né  `the granary'

Vowel lengthening does occur sporadically in the definite suffixation of other noun
classes. However, there does not seem to be any predictable pattern as is found in the Class 5 nouns.

The disyllabic roots follow the same pattern of definite suffixation. The only exception is in the case of Class 5 nouns which have the extended -rV- root. Unlike monosyllabic Class 5 nouns which seem to retain some semblance of the indefinite suffix when adding the definite suffix, these nouns drop both the final syllable of the noun root, -rV-, and the indefinite suffix before adding the definite suffix.

(95) kùdè [kùrè-lò] -> kù-ne `the chair' *kù-ù-ne *kùrè-ne

Below is chart (96) with the definite forms of disyllabic nouns. Please refer to (8) for English glosses.

<table>
<thead>
<tr>
<th></th>
<th>1 (wi)</th>
<th>3 (ki)</th>
<th>5 (li)</th>
<th>7 (ti)</th>
<th>8 (pi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l- IND</td>
<td>folò &lt;22&gt;</td>
<td>gbèlôxè &lt;7&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEF</td>
<td>folè-ñè</td>
<td>gbèlô-ke</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-r-</td>
<td>sáru &lt;10&gt;</td>
<td>ñgurixo &lt;12&gt;</td>
<td>kùdò &lt;14&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sárt-ñé</td>
<td>ñgurt-ñé</td>
<td>kù-ne</td>
<td></td>
<td></td>
</tr>
<tr>
<td>r-V(N)</td>
<td>cérèñè &lt;1&gt;</td>
<td>nkôrèño &lt;2&gt;</td>
<td></td>
<td>ferìmè &lt;2&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>cérè-ñé</td>
<td>nkôrè-ñè</td>
<td></td>
<td>ferì-ñè</td>
<td></td>
</tr>
<tr>
<td>-?-</td>
<td>kàññà &lt;6&gt;</td>
<td>sèòèlè &lt;1&gt;</td>
<td>kòòòrò &lt;1&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kàññà-ke</td>
<td>sèòè-ñè</td>
<td>kòò-òte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>?-V(N)</td>
<td>nya?òñà &lt;6&gt;</td>
<td>sèëènc &lt;1&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>nya?ò-ñè</td>
<td>sèëè-ñè</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-x-</td>
<td>fyèxù &lt;2&gt;</td>
<td></td>
<td></td>
<td>tuxurò &lt;2&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fyèxù-ñè</td>
<td></td>
<td></td>
<td>tuxû-te</td>
<td></td>
</tr>
<tr>
<td>x-V(N)</td>
<td></td>
<td></td>
<td></td>
<td>ndùxènò &lt;1&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ndùxè-nde</td>
<td></td>
</tr>
</tbody>
</table>
B. Structure - Type II nouns

The Definite Suffixes of Type II nouns are similar in structure to the definite suffix of Type I nouns in that the initial consonant of the suffix is at the same point of articulation as the consonant of the indefinite suffix. Thus for class 2, the definite suffix is bilabial, as shown below in (97a) and for Class 6, it is velar.

(97) Class Indefinite C  Definite C  Indef.  Definite

a. 2  m, b  ->  b  ñnáá-mi  ->  ñnáá-m-bí  'sons'
b. 6  x  ->  k  pó-xílo  ->  pó-xè-kí  'bodies'

In citation form, as given in (97), it appears that the definite suffix of Type II nouns is monosyllabic. However, when followed by a vowel initial morpheme, such as the verbal particle, à, which coalesces to the final vowel of the subject, one observes the appearance of an -l-, as seen below.

(98) Class 6  nyíi-kí  'eyes'  nyíi-kíla-à wù yá  'the eyes hurt him'
    Class 2  sškàà-bí  'goats'  sškàà-bíla-à foori  'the goats have gone out'

This observation leads to the hypothesis that the underlying shape of these suffixes are: Class 2 - bíli and Class 6 - kíli₁³.

Instead of replacing the indefinite suffix with the definite suffix, as was the case for Type I nouns, Type II definite nouns are formed by adding the definite suffix to an indefinite suffixed noun stem. Thus, for the noun ni-i  'eyes', the definite form is ni-i-kí. However, when the indefinite suffix consists of two TBU's, the addition of the definite suffix causes the reduction of the two TBU suffix to one TBU, as shown in (99).

(99) pó - xílo - kí  ->  pó - xè - kí  'the bodies'

Root  Ind  Def
The effect is that definite Type II nouns consistently have only three TBU’s, the first TBU being reserved for the noun root, the second for the indefinite suffix, and the third for the definite suffix. Below are examples of ways the indefinite suffix of Class 6 nouns is reduced to one mora when followed by a definite suffix.

(100) Class 6

<table>
<thead>
<tr>
<th>CL 5 IND</th>
<th>CL 6 IND</th>
<th>CL 6 DEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. pùlo</td>
<td>pò-xolo</td>
<td>pò-xö-kí ‘body, trunk’</td>
</tr>
<tr>
<td>b. colò</td>
<td>cò-?olo</td>
<td>cò-?ö-kí ‘clay pot’</td>
</tr>
<tr>
<td>c. jide</td>
<td>jèrè-ŋi</td>
<td>jèrè-ŋ-gí ‘breast’</td>
</tr>
<tr>
<td>d. sènc</td>
<td>sè-ŋi</td>
<td>sè-ŋ-gí ‘sting’</td>
</tr>
<tr>
<td>e. tile</td>
<td>tií-xi</td>
<td>ti-xö-kí ‘cock’s crest’</td>
</tr>
<tr>
<td>f. kidè</td>
<td>kir-le</td>
<td>kir-ã-kí ‘country’</td>
</tr>
<tr>
<td>g. kudò</td>
<td>kuù-xi</td>
<td>ku-xö-kí ‘rule, road’</td>
</tr>
<tr>
<td>h. cedz</td>
<td>cer-ã-lç</td>
<td>cer-ã-kí ‘calabash, gourd’</td>
</tr>
<tr>
<td>i. nyelè</td>
<td>nyi-i</td>
<td>nyi-i-kí ‘eye’</td>
</tr>
</tbody>
</table>

Whatever -lV suffixing there was in the indefinite form is deleted with the addition of the definite suffix. However, the initial syllable of the indefinite suffix tends to be maintained (examples a,b). In the case of the nasalized indefinite suffix, the nasal is retained and as a result, it causes voicing of the Class 6 definite suffix consonant (c,d). The extended -rV- roots tend to retain this extension, causing the segmental deletion of the entire indefinite suffix (f,h). There is, however, one instance of the -rV- deleting, allowing the first syllable of the indefinite suffix to remain (g).
Class 2 nouns undergo the same type of segmental reduction processes, as seen below:

(101) Class 2

<table>
<thead>
<tr>
<th>CL 1 IND</th>
<th>CL 2 IND</th>
<th>CL 2 DEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. jó</td>
<td>jó-łó</td>
<td>jó- bí</td>
</tr>
<tr>
<td>b. fyáa</td>
<td>fyáa-la</td>
<td>fyáa- bí</td>
</tr>
<tr>
<td>c. pààn</td>
<td>pààn-la</td>
<td>pààn- bí</td>
</tr>
<tr>
<td>d. poru</td>
<td>porú-łó</td>
<td>porú- bí</td>
</tr>
<tr>
<td>e. sónlu</td>
<td>sónlu-łó</td>
<td>sónlu- bí</td>
</tr>
<tr>
<td>f. ñnáa</td>
<td>ñnáa- mi</td>
<td>ñnáa- bí</td>
</tr>
<tr>
<td>g. nö</td>
<td>nö- i</td>
<td>nö- i- bí</td>
</tr>
</tbody>
</table>

**C. Definite Suffix Tone**

The tone of the definite suffix varies according to the noun of the root. For both Type I and Type II nouns, the definite suffix is Mid tone when preceded by Low final and High tone roots and High tone when preceded by a Mid final or a Low-High noun. Examples for Type I definite nouns are given below in (101). Note that the entire contour of Mid-Low nouns is linked to the noun root when followed by a definite suffix (b), while Low-high nouns link only the Low tone of the contour to the root. This contrast in behaviour will be explained shortly.
## (102) Type I Nouns

<table>
<thead>
<tr>
<th>Root tone</th>
<th>Indefinite</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Low</td>
<td>mɔlɔ --&gt;</td>
<td>mɔlɛ-ne</td>
</tr>
<tr>
<td>b. Mid-Low</td>
<td>fu-ŋɔ --&gt;</td>
<td>fʊn-ge</td>
</tr>
<tr>
<td>c. High-Low</td>
<td>sʊ-lɔ --&gt;</td>
<td>sʊú-ne</td>
</tr>
<tr>
<td>d. High</td>
<td>fælà-ɔxɔ --&gt;</td>
<td>fælà-ke</td>
</tr>
<tr>
<td>e. Mid</td>
<td>gba-xa --&gt;</td>
<td>gba-kɛ</td>
</tr>
<tr>
<td>f. Mid W</td>
<td>sʊ-xe --&gt;</td>
<td>sʊ-kɛ</td>
</tr>
<tr>
<td>g. High-Mid</td>
<td>fya-a --&gt;</td>
<td>fya-a-ŋɛ</td>
</tr>
<tr>
<td>h. Low-High</td>
<td>gbɔn-lɔ --&gt;</td>
<td>gbùn-nɛ</td>
</tr>
</tbody>
</table>

In certain cases to be discussed in Chapter 5, a Low tone root becomes Mid tone when preceded by another Mid tone word. When this happens, the definite suffix is subsequently High tone: mo mɔlɛ-ne --> mo mɔlɛ-ŋɛ  'your rice.'

Recall that Type II definite nouns are formed by adding a definite suffix to an indefinite suffixed noun. Since all Type II indefinite noun stems end in a Mid tone, the definite suffix, when added to Type II nouns, is predictably High tone. The examples in (103), (104), (105), and (106) make this point clear. In each set of examples, the indefinite singular (of Classes 1 and 5) for each Type II noun (plural classes 2 and 6) is given, followed by the indefinite form of the Type II noun, and finally in the right hand column, by the definite Type II noun.

The examples in (103) are nouns with a Mid tone noun root. The High-Mid tones of the indefinite suffix are both linked to the second TBU of the definite noun. In the structural description of the Type II definite noun it was shown that the noun root, the indefinite suffix, and the definite suffix are each given a single mora.
In the examples below, it will be noted that there are no segments that could be labeled as belonging to the indefinite suffix. Yet, the tone of the indefinite suffix still shows up on the second TBU. The same is true for the nouns with Low-High noun roots found in (104).

(103) \(M-HM \rightarrow M-HM-H\)

<table>
<thead>
<tr>
<th>Ind Sg.</th>
<th>Ind. Pl.</th>
<th>Def. Pl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. gba</td>
<td>gbaála</td>
<td>gbaábí</td>
</tr>
<tr>
<td>b. ntide</td>
<td>nteréle</td>
<td>nterěkí</td>
</tr>
<tr>
<td>c. calou</td>
<td>caléla</td>
<td>calěbí</td>
</tr>
</tbody>
</table>

`river'
`bat'
`pig'

(104) \(L-HM \rightarrow L-HM-H\)

| a. mgbilè | mgbiíŋí | mgbiíŋí |
| fèränder  | fèränder | fèränder |

`threshing stick'
`winnowing basket'

High-Mid nouns invariably have only a Mid tone linked to the second TBU.

(105) \(H-HM \text{ or } HM-M \rightarrow H-M-H\)

| a. mgbínè | ngbínélé | mgbínþí |
| b. jó     | jóóló   | jóóbí   |
| c. fyáa   | fyáala  | fyáabí  |
| d. séŋénc | séŋéni  | séŋegí  |

`bamboo mat'
`pocket'
`fish'
`palm nut'

Low tone noun roots exhibit slightly different behaviour. Recall that the Low tone Spreading rule spreads the Low tone of the root onto the High tone of the indefinite suffix, creating a surface Mid tone. When a definite suffix is added to such a noun stem, as shown below in (106), the definite suffix is predictably High
tone. However, the tone of the second TBU is not Mid tone, as might be expected, but rather Low tone. The reader is asked to refer to Chapter 5 for a proposed analysis of this behaviour.

(106) L-MM or LL-M -> L-L-H

a. cò còolo còòbí 'net'
b. ąméélè ąméèŋí ąméèŋí 'corner, angle'
c. kídè kirûle kèràkí 'country'
d. lûlò lôxolo lôxòkí 'bile'
e. ceewè cèe cèèbí 'woman'
f. njëdè njërule njërückí 'tongue'
g. gbînlò gbôn?olo gbòn?òkí 'fireplace'
h. foló fò?olo fò?òkí 'debt'
i. ncile ncixûle ncixikí 'balaphon'
j. nkànlà nkàn?ùnla nkàn?ànkí 'tooth'

The underlying tone of the definite suffix is not at all straightforward. Although the definite suffix tone is either High or Mid tone on the surface, it also seems to possess a final floating Low tone which never links to the suffix. This is suspected because it triggers the same type of tonal behaviour as other Low final nouns. It will be seen in Chapters 4 and 5 that Low final nouns trigger Low tone spread onto adjacent High tone verbs and weak Mid and Mid-Low nouns. All definite suffixed nouns also do this regardless of whether the surface definite suffix tone is High or Mid. The examples below show that the definite suffixed noun causes a High tone verb to become Low-High.

(107) a. wàà gbaké pèré /pèré/ 'he sold the house'
b. waa môlè˘nè pèré /pèré/ 'he sold the rice'
c. waa gbûùnné pèré /pèré/ 'he sold the granary'
Early observations revealed that the definite suffix tone was one up from the final root tone and one down from a high tone root. It was clear, too, that the definite suffix never had the same tone as the final root tone.

If we were to suggest that the definite suffix tone is High(Low), then the presence of a Mid tone after High tone and Low tone nouns would then have to be explained. We have already proposed a Low tone spreading rule in other contexts where a Low-High contour was simplified to Mid tone. Might a Mid tone suffix after Low tone noun root be a result of Low tone spread onto High tone? Such a possibility is illustrated by the example below.

(108) môlê-nê `the rice'

\[
\begin{array}{c}
\text{L} \\
\text{H(L)} \\
\text{L} \\
\text{H(L)}
\end{array}
\]

LOW SPREAD

An observant reader may recall that High tone delinking takes place in phrase final position and before High tones. The lack of any type of High tone delinking taking place here can be explained by the pervasive presence of the final floating Low tone.

Low-High nouns in the definite form possess only a Low tone root on the surface. They are distinguished from real Low tone verbs, however, by the fact that the definite suffix is High tone and not Mid tone:

(109) \[\begin{array}{c}
\text{Ind} \\
\text{Def}
\end{array}\]

Low-High \[\begin{array}{c}
bè-lê \rightarrow \text{bè-né} \\
\text{`ground nut'}
\end{array}\]

Low \[\begin{array}{c}
bèlê \rightarrow \text{bè-ne} \\
\text{`seed'}
\end{array}\]

This can be easily explained by the fact that Low-High roots are not Low final and therefore do not trigger Low tone spreading onto the suffix. The Low-High example
in (109) is also subject to High tone delinking rule (37) in order to simplify the Low-High contour before a High tone, as shown below:

\[
\begin{align*}
\text{bà-né} & \quad \text{`ground nut'} \\
\hline
\text{L} & \text{H} & \text{H}
\end{align*}
\]

This process is to be expected here because both the Low and the High are linked to the same TBU. However, the motivation for High delinking is not quite so obvious on Low-High nouns with two TBU's, such as \text{ndôrè-ké}. Both left to right and right to left linking conventions would link \text{ndôròke} in the same manner and produce the form, \text{ndôrè-ké}. However, the final surface form is not \text{ndôraké} but rather \text{ndôrèkè}. It appears then, that in addition to the linking conventions that some morpheme internal Low tone spreading has been taking place, followed by High delinking:

\[
\text{ndôrè-ké} \rightarrow \text{ndôrè-kè} \quad \text{`the yam'}
\]

\[
\begin{align*}
\text{L} & \text{H} & \text{H} & \text{L} & \text{H} & \text{H}
\end{align*}
\]

High tone nouns create a problem, however. Why would a High tone suffix lower to Mid after another High? There are a couple of clues. In Supyire of Farakala (Mali), there is a very productive downstep rule, stating that when two adjacent High's are adjacent to each other, the second automatically downsteps to mid (Carlson, 1983). We do not have this same productiveness in Sucite but there are a few hints of such a downstep phenomenon in word formation processes. Earlier, we observed that the truly Senufo (non-loan) High nouns generally adopted a HM contour. In addition, Mills (1984) states that in Cebara, HM is an allotone of High tone nouns. Secondly, there are variant pronunciations in some indefinite High tone Class 4 nouns. Normally, the tonal pattern is HHH but in some cases, it may be HHM.
Below is an example of the variant tonal pattern:

(111) sáří-ya  `tobaccos',  rather than the expected sáří-yà
      mpá?á-ya  `porridges'

The words that accept this variation are forced plurals, that is, plurals of words that are not normally pluralized.

Whatever the motivation may be, there seems to be a kind of downstepping phenomenon (or lowering of the second High tone) in the definite suffixation process.

A second alternative analysis is to suggest that the definite suffix is underlyingly Mid tone. It has already been proposed that Mid tone is a composite of two features placed on separate but linked tiers. This would be a relatively simple solution for High and Low tone nouns since the Mid tone remains unchanged.

(112) môlà-ne  `the rice'

(113) fâlé-ke  `rock'

However, after Mid tone nouns and Low-High Nouns, this Mid tone becomes High tone.

(114) gba-ke --> gba-ké  `the rice'
    ndôrë-ke --> ndôrë-ké  `the yam'

Perhaps if Mid tone consisted of a complex of High and Low tone features this apparent raising phenomenon could possibly be explained by some type of Low tone deletion. Earlier in Chapter 2, the Lowering of Mid tone verbs to Low tone was explained by the process of High deletion of the complex Lh tonal features.
It is possible that some type of Low deletion process could be motivated for the definite suffix. However, at this point, this approach can not be adequately defended. Therefore, the problem of the definite suffix will be taken up again when the general tone analysis of Sucite has been further developed in Chapter 5.

V. CONCLUSION

This chapter has been a discussion of noun morphology and tone. Two types of indefinite suffixes were identified. The Type I Indefinite Suffix was shown to possess no underlying tone of its own while the Type II suffix was posited as having a High-Mid tone. Each suffix type brought with it problems of associating tone to segments. Having established that nominal tone was melodic, it was given a separate tier. Discussion of the Type I indefinite nouns revealed the need to change the direction of associating tones and TBU's from the conventional Left to Right Linking to Right to Left Linking.

The various types of segmental deletions of the Type II indefinite suffix brought up the issue of when tones should be associated to TBU's. It was established that the Association Conventions be ordered before the Segmental deletions. As a result, adjustment rules were required to link leftover TBU's and tones. The reader may refer to p.116 for a list of these rules.

In addition to the problems encountered concerning the association of tones to the segments, tonal variation on both noun roots and suffixes was observed. The lowering of a High tone definite suffix (115a) and the High-Mid Type II suffix (115b) to Mid tone before Low tone roots was explained by proposing the Low tone Spread rule of Chapter 2 (33). This Low Spreading is illustrated below.
(115)  a. pùù-ne  `the body’  b. pò-xélo  `bodies’

The High tone Delinking rule of Chapter 2 (37) also found its application in nouns, specifically in Low-High nouns which were followed by a High initial definite suffix (116a) and Type II suffix (116b).

(116)  a. bò-né  `ground nut’  b. gbôn-xélo  `granaries’

Finally, it was observed that the root tone of some Mid initial and Low-high nouns changed to Low tone when followed by the High tone Type II suffix. It was also seen that the Mid tone verb lowered to Low tone when followed by a High tone incompletive suffix. A tentative solution for both nouns and verbs involved the use of a double tiered approach for tone and the positing of a High Deletion rule, which initially was formulated in Chapter 2 as deleting a High tone on the subregister tier when linked to Low tone on the primary tier (59), but revised in Chapter 3 to also include the deletion of High tone on the primary tier (88). It was acknowledged, however, that this proposed rule remains quite tentative pending a more thorough analysis of Mid tones in Chapter 5.

NOTES

1. Mills noted that High tone nouns in Cebara may be followed by a final Mid: "Allotones ['] and ['-] are features of the grammatical class of nouns. The final mid tone following high or rising tones occurs only on noun suffixes, on some noun stems, and on adjective stems. This could be extended to noun phrases, as some adjectives bear the high-mid allotone.” (1984, p.117)

2. The word final vowel tends to be lowered slightly after High vowel roots.

    cî-lV  ->  ci-lì  ->  ci-lè  `thigh’
    cò-lV  ->  co-lò  ->  co-lû Ø  `clay pot’

Low vowels remain as they are:
    con-rV  ->  con-ro  `ashes’
Similar behaviour is found in other Senufo languages such as Cebara.

3. See a brief description of a similar type of coalescence in Chapter 2.

4. In Supyire, there is a set of Mid-Low nouns which, in the indefinite form, are realized on the surface as Mid tone nouns. It is only when a definite suffix has been added that the Mid-Low contour surfaces:

<table>
<thead>
<tr>
<th>Indefinite</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supyire</td>
<td>sikà-ŋi</td>
</tr>
<tr>
<td>Sucite</td>
<td>sikà-ŋe</td>
</tr>
</tbody>
</table>

5. There is a set of compound-like nouns exhibiting a High falling tone on the final noun root which do behave like Low final nouns, however. Perceptually there is no tonal difference between the pitch of the underlying final High tone and the tone of the final syllable of this set of nouns. However, like Low final nouns, they trigger Low tone spreading onto High tone verbs, as shown below.

waa náfàn wéé  -> waa náfàn wéé  `he looked at a brick'
waà kurugbá wéé -> waà kurugbá wèé  `he looked at a shelter'

These nouns are primarily loan words. They behave like compound nouns tonally and segmentally in that they are composed of two stressed components, each possessing its own tonal melody. If the last component of the `compound' possesses only one TBU and has a High-Low tonal melody, this High-Low tone being linked to a single TBU produces a High falling tone on the surface, as shown in the two examples, below.

kuru-gbá  `shelter (grass overhang)'
\[ \begin{array}{c}
M \\
\text{HL}
\end{array} \]

tâmà-ti  `tomato' (French, tomate)
\[ \begin{array}{c}
L \\
\text{HL}
\end{array} \]

When a High-Low tonal melody is assigned two TBU's, each tone links to a TBU. The second component of the compound nouns given below illustrate this.

fù-gbélè  `Senufo basket'
\[ \begin{array}{c}
L \\
\text{HL}
\end{array} \]

lú-fíi  `water python'
\[ \begin{array}{c}
H \\
\text{HL}
\end{array} \]

mpá?à  `porridge' (Dioula, baga)
\[ \begin{array}{c}
\text{HL}
\end{array} \]
6. Cebara follows a surprisingly similar pattern. Observe the examples below.

<table>
<thead>
<tr>
<th>High</th>
<th>Mid</th>
<th>Low</th>
<th>Mid-Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>bûrû=béle</td>
<td>tjari=géle</td>
<td>li:gele</td>
<td>ko-bi:=gèle</td>
</tr>
<tr>
<td>'bread' (pl)</td>
<td>'calabashes'</td>
<td>'meals'</td>
<td>'paths'</td>
</tr>
</tbody>
</table>

7. In Supyire, the High of the High-Mid suffix shifts to the root of a Mid tone noun, with the result that the Mid tone of the root is completely deleted. Below are a couple of examples with corresponding words in Sucite:

<table>
<thead>
<tr>
<th>Supyire</th>
<th>Sucite</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>caá-li</td>
<td>calé-la</td>
<td>'pigs'</td>
</tr>
<tr>
<td>sëŋ-ii</td>
<td>sèŋ-qi</td>
<td>'stings'</td>
</tr>
</tbody>
</table>

8. Supyire also has a set of underlying Mid-Low nouns corresponding to the same group in Sucite, but this ML contour is simplified to Mid when adding indefinite suffixes. As a result, when adding Type II suffixes, the output is a MM sequence instead of MLM. Compare the Supyire and Sucite example below:

<table>
<thead>
<tr>
<th>Supyire</th>
<th>Sucite</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>cën=lii</td>
<td>ciín-le</td>
<td>'younger siblings'</td>
</tr>
</tbody>
</table>

9. V LENGTH refers to a rule not discussed in this thesis. It frequently happens that if the suffix is partially deleted, a noun root with a single TBU will lengthen its vowel. This process seems to be a part of a more general attempt to maintain three TBU's on nouns with Type II indefinite suffixes.

10. This rule refers to the derivational history of the word in its formulation. Although certain authors have used derivational history in the formulation of their rules, this approach has been contested in the literature (through personal communication, C. Kisseberth). While acknowledging the controversial nature to this approach, I shall keep this formulation of the Suffix High Linking rule until such time that a more satisfactory solution may be found.

11. The same informant gave both forms in the space of a couple of minutes. Both were pronounced in isolation.

12. In fact, it is possible that historically, definite suffixes were suffixed to indefinite noun stems. Whether this kind of information would be helpful for synchronic analysis remains to be seen.
13. Cebara definite suffixes for these same classes are bisyllabic; Class 2 - bele, and Class 6 - gele.
1. Mills noted that High tone nouns in Cebara may be followed by a final Mid: "Allotones [''] and ['-'] are features of the grammatical class of nouns. The final mid tone following high or rising tones occurs only on noun suffixes, on some noun stems, and on adjective stems. This could be extended to noun phrases, as some adjectives bear the high-mid allotone." (1984, p.117)

2. The word final vowel tends to be lowered slightly after High vowel roots.

\[
\begin{align*}
cî-lV & \rightarrow \text{ci-lî} \rightarrow \text{ci-lè} & \text{`thigh'} \\
cô-lV & \rightarrow \text{co-lo} \rightarrow \text{co-lò} & \text{`clay pot'}
\end{align*}
\]

Low vowels remain as they are:

\[
\begin{align*}
\text{con-rV} & \rightarrow \text{con-ro} & \text{`ashes'}
\end{align*}
\]

3. See a brief description of a similar type of coalescence in Chapter 2.

4. In Supyire, there is a set of Mid-Low nouns which, in the indefinite form, are realized on the surface as Mid tone nouns. It is only when a definite suffix has been added that the Mid-Low contour surfaces:

\[
\begin{align*}
\text{Indefinite} & & \text{Definite} \\
\text{Supyire} & \text{sika,} & \text{sika-ŋi} & \text{'goat, goat-DEF'} \\
\text{Sucite} & \text{sika,} & \text{sika-ŋe} & \text{'goat, goat-DEF'}
\end{align*}
\]

5. There is a set of compound-like nouns exhibiting a High falling tone on the final noun root which do behave like Low final nouns, however. Perceptually there is no tonal difference between the pitch of the underlying final High tone and the tone of the final syllable of this set of nouns. However, like Low final nouns, they trigger Low tone spreading onto High tone verbs, as shown below.

\[
\begin{align*}
\text{waa nèfàn wèé} & \rightarrow \text{waà nèfàn wèé} & \text{`he looked at a brick'} \\
\text{waà kūrūgbà wèé} & \rightarrow \text{waà kūrūgbà wèé} & \text{`he looked at a shelter'}
\end{align*}
\]

These nouns are primarily loan words. They behave like compound nouns tonally and segmentally in that they are composed of two stressed components, each possessing its own tonal melody. If the last component of the `compound' possesses only one TBU and has a High-Low tonal melody, this High-Low tone being linked to a single TBU produces a High falling tone on the surface, as shown in the two examples, below.

\[
\begin{align*}
kūrū-gbà & \quad \text{`shelter (grass overhang)'} \\
\text{TBU} & \quad \text{HL}
\end{align*}
\]

\[
\begin{align*}
tàmà-tì & \quad \text{`tomato' (French, tomate)} \\
\text{TBU} & \quad \text{HL}
\end{align*}
\]

When a High-Low tonal melody is assigned two TBU's, each tone links to a TBU. The second component of the compound nouns given below illustrate this.
6. Cebara follows a surprisingly similar pattern. Observe the examples below.

   High  bûrû=bêle  'bread' (pl)
   Mid   tjari=gêle  'calabashes'
   Low   li:gele    'meals'
   Mid-Low ko-bi:=gèle  'paths'    Mills (1984)

7. In Supyire, the High of the High-Mid suffix shifts to the root of a Mid tone noun, with the result that the Mid tone of the root is completely deleted. Below are a couple of examples with corresponding words in Sucite:

   Supyire   Sucite   English
   a.  cáá-li  calé-la  'pigs'
   b.  sëŋ-ii  sê-qi  'stings'

8. Supyire also has a set of underlying Mid-Low nouns corresponding to the same group in Sucite, but this ML contour is simplified to Mid when adding indefinite suffixes. As a result, when adding Type II suffixes, the output is a MM sequence instead of MLM. Compare the Supyire and Sucite example below:

   Supyire   Sucite   English
   cçrn=lii  ciin-le  'younger siblings'

9. V LENGTH refers to a rule not discussed in this thesis. It frequently happens that if the suffix is partially deleted, a noun root with a single TBU will lengthen its vowel. This process seems to be a part of a more general attempt to maintain three TBU's on nouns with Type II indefinite suffixes.

10. This rule refers to the derivational history of the word in its formulation. Although certain authors have used derivational history in the formulation of their rules, this approach has been contested in the literature (through personal communication, C. Kisseberth). While acknowledging the controversial nature to this approach, I shall keep this formulation of the Suffix High Linking rule until such time that a more satisfactory solution may be found.
11. The same informant gave both forms in the space of a couple of minutes. Both were pronounced in isolation.

12. In fact, it is possible that historically, definite suffixes were suffixed to indefinite noun stems. Whether this kind of information would be helpful for synchronic analysis remains to be seen.

13. Cebara definite suffixes for these same classes are bisyllabic; Class 2 - bele, and Class 6 - gele.