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2. Phonology

This chapter presents the Lumun phonemes and their distribution and realization, as well as processes of assimilation and elision across morpheme boundaries within the phonological word and across word boundaries. The term ‘phonological word’ refers here to a lexical root which may be (partially) reduplicated and to which one or more affixes and/or clitics may be added. Phonological rules typically apply within this domain. In connected speech, the same phonological rules may also apply post-lexically. The notions ‘word-initial’ and ‘word-final’ therefore refer to the position of a phoneme in an isolated word.

Specific morphemes may interact with an adjacent phoneme or morpheme in a specific way. Such morpho-phonological processes are mentioned in the chapter or section concerned with the morpheme, but in some cases also (briefly) noted here.

Make-up of phonological words

Verbal affixes comprise the concords and derivational and inflectional affixes. Concords on verbs are markers of agreement with the subject (pro)noun. Clitics to the verb are the subject and object pronominal clitics and the relative clitic (i-). Certain auxiliaries form a phonological word together with the verbal stem. Affixes and clitics to adjectives comprise the concords, subject pronominal clitics and the relative clitic.

Nominal affixes are the noun class prefix, the persona prefix (ɔ-) and the plural suffix (-nɔ̂n). The prepositional elements ɪ- ‘in’, nɔ- ‘on, at’, tɔ- ‘up on, up at’, tɔ- ‘at’ and nɪ- ‘with, by, (away) from’ are adnominal clitics, as is connexive c-ɔ- ‘of’ (where c stands for concord). The locative focus pro-clitic cɪk- can precede a locative prepositional proclitic (PPC).

Other word categories are, or can be, morphologically complex as well: modifiers such as pronominal possessors and demonstratives contain a concord that marks agreement with the noun they modify;
the independent pronouns contain the persona prefix; absolute prepositions contain a prepositional proclitic; adverbs can involve reduplication; and question words may have the suffix -\textipa{\textipa{\textipa{-t̪a}}}. Some enclitic particles are not restricted to a certain word category. The question clitics -\textipa{-i}, -\textipa{-a} and -\textipa{-e} (chapter 20.2) and the discourse clitics -\textipa{-a}, -\textipa{-ti}, -\textipa{-mɛ} and -\textipa{-na} (chapter 17.2) are attached at phrase or clause level.

The observations in this chapter are primarily based on the speech of one speaker, John Shakir (JS), who was born in the valley settlement T̪ɔɽɪ̂. Some additional remarks are made on the basis of the speech of Nafisa Abdullah (NaA) from T̪ɔɽɔmat̪ɔn, and Nimeri Alemin (NiA) from T̪ɔʊmâŋ, both uphill settlements. Nimeri Alemin speaks with more lenition, assimilation and elision than Nafisa Abdullah, both within phonological words and across word boundaries. The speech of John Shakir can be placed somewhere in between. According to JS the differences between the speech of NaA and NiA represent general differences between the speech of inhabitants of T̪ɔɽɔmat̪ɔn on the one hand, and T̪ɔʊmâŋ and T̪aɽʊ on the other hand. Inhabitants of T̪ɔʊmâŋ and T̪aɽʊ typically speak very fast, while several of the speakers from T̪ɔɽɔmat̪ɔn speak somewhat slower and more articulated. It appears that there is no stereotypical picture of the speech of T̪ɔɽɪ, possibly due to its more heterogeneous population: Lumun people from different uphill places have settled in T̪ɔɽɪ.

In this chapter I have added several phonetic transcriptions, which aim to approximate actual pronunciations of the segments. Pitch is indicated on these transcriptions by an acute accent (high pitch), circumflex accent (falling pitch) or macron (slightly raised pitch). The slightly raised pitch corresponds to a rising toneme in prepausal position (see chapter 3). Low pitch is left unmarked in these phonetic transcriptions.

2.1. Consonants

The consonant phonemes of Lumun are presented in the following table. The parentheses around \textipa{ŋ} indicate its marginal status.
An overview of the phonetic consonants follows here. Sounds which are infrequent are presented between parentheses. Some very incidental sounds are not included in the table, but will be mentioned in this chapter. Not explicitly mentioned in the table are unreleased t [t̚] and k [k̚]. Notably, Lumun lacks voiceless fricatives.

Table 4 Consonant phonemes

<table>
<thead>
<tr>
<th></th>
<th>bilabial</th>
<th>dental</th>
<th>alveolar</th>
<th>retroflex</th>
<th>palatal</th>
<th>velar</th>
<th>labialized velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>obstruents</td>
<td>p</td>
<td>t</td>
<td>t</td>
<td>c</td>
<td>k</td>
<td>kʰ</td>
<td></td>
</tr>
<tr>
<td>nasals</td>
<td>m</td>
<td>n</td>
<td>n̥</td>
<td>n̥</td>
<td>(ŋ̥)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rhotics</td>
<td>r</td>
<td>r̥</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td>l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>approximant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>w</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 Phonetic consonants

<table>
<thead>
<tr>
<th></th>
<th>bilabial</th>
<th>dental</th>
<th>alveolar</th>
<th>retroflex</th>
<th>palatal</th>
<th>velar</th>
<th>labialized velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>voiceless plosives</td>
<td>p</td>
<td>t</td>
<td>t</td>
<td>c</td>
<td>k</td>
<td>kʰ</td>
<td></td>
</tr>
<tr>
<td>voiced plosives</td>
<td>b</td>
<td>d̪</td>
<td>d</td>
<td>j̥</td>
<td>g</td>
<td>gʰ</td>
<td></td>
</tr>
<tr>
<td>voiced fricatives</td>
<td>β</td>
<td>δ̆</td>
<td></td>
<td>j̥</td>
<td>(ŋ̥)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>approximants</td>
<td>m, mː</td>
<td>n̥</td>
<td>n, nː</td>
<td>j̥, (ŋː)</td>
<td>ŋ̥, (ŋː)</td>
<td>(ŋʰ)</td>
<td></td>
</tr>
<tr>
<td>nasals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rhotics</td>
<td>r, rː</td>
<td></td>
<td></td>
<td></td>
<td>ŋ̥</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lateral</td>
<td>l, lː</td>
<td></td>
<td></td>
<td></td>
<td>ŋ̥</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.1.1. The phonemes \( p, t̪, t, c, k \) and \( k^w \)

The phonemes \( p, t̪, t, c, k \) and \( k^w \) each represent a series of allophones which are fully conditioned by their position in the isolated word and, word-medially, by adjacent sounds. Table 6 presents the realizations in different positions in the isolated word, table 7 the realizations in additional environments that occur across word boundaries. The parentheses around the realization of the phoneme \( t \) in word-final position indicate that the phoneme is rare in that position.

**Table 6 Allophones and distribution of \( p, t̪, t, c, k \) and \( k^w \) in isolated words**

<table>
<thead>
<tr>
<th></th>
<th>/p/</th>
<th>/t̪/</th>
<th>/t/</th>
<th>/c/</th>
<th>/k/</th>
<th>/k^w/</th>
</tr>
</thead>
<tbody>
<tr>
<td>word-initial and as</td>
<td>[p]</td>
<td>[t]</td>
<td>[t]</td>
<td>[c]</td>
<td>[k]</td>
<td>[k^w]</td>
</tr>
<tr>
<td>geminate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>word-final</td>
<td></td>
<td>([t'])</td>
<td>[t']</td>
<td>[k']</td>
<td></td>
<td></td>
</tr>
<tr>
<td>after a nasal</td>
<td>[b]</td>
<td>[d]</td>
<td>[d]</td>
<td>[j]</td>
<td>[g]</td>
<td>[g^w]</td>
</tr>
<tr>
<td>between vowels</td>
<td>[β]</td>
<td>[ð]</td>
<td>[r]</td>
<td>[j]</td>
<td>[uŋ]</td>
<td>[uŋ^w]</td>
</tr>
<tr>
<td>before a nasal</td>
<td></td>
<td>[N]^*</td>
<td></td>
<td></td>
<td>[N]^*</td>
<td></td>
</tr>
</tbody>
</table>

*This occurs only before a morpheme boundary, in practice before a suffix or enclitic particle. In such cases \( t \) and \( k \) fully assimilate to the nasal. The resulting geminate is then shortened. Before the clitics -na and -mé (see 17.2.2 and 17.2.4), however, \( t \) and \( k \) become nasal, but retain their place of articulation. Some examples follow later in this section.

**Table 7 Realization of \( p, t̪, t, c, k \) and \( k^w \) in additional environments in connected speech across word boundaries**

<table>
<thead>
<tr>
<th></th>
<th>/p/</th>
<th>/t̪/</th>
<th>/t/</th>
<th>/c/</th>
<th>/k/</th>
<th>/k^w/</th>
</tr>
</thead>
<tbody>
<tr>
<td>before certain nasal-initial words</td>
<td></td>
<td>[r]</td>
<td></td>
<td></td>
<td>[uŋ]</td>
<td></td>
</tr>
<tr>
<td>after l or r</td>
<td>[β]</td>
<td>[ð]</td>
<td>[r],</td>
<td>[j]</td>
<td>[uŋ]</td>
<td>[uŋ^w]</td>
</tr>
</tbody>
</table>
Articulation of dental and alveolar stops

The difference between \([t]\) and \([\text{t}^\prime]\) and \([\text{t}^\prime\prime]\), and \([d]\) and \([\text{d}]\), respectively, is a difference of both the active articulator and the target area. \([t]\), \([\text{t}^\prime]\) and \([\text{d}]\) are lamino-dental: they are articulated with the blade of the tongue touching the teeth but not becoming visible, whereas \([t]\), \([\text{t}^\prime]\) and \([\text{d}]\) are apico-alveolar: articulated with the tip of the tongue touching the alveolar ridge.

For ease of reference, I refer to the phoneme series \(p, \text{t}, t, c, k\) and \(k\^w\) as the ‘obstruent phonemes’, though some of the intervocalic allophones are not obstruents.

Obstruent phonemes in word-initial position

The following series substantiate the phonemic status of \(p, \text{t}, t, c, k\) and \(k\^w\), and illustrate their pronunciation as voiceless stops in initial position of isolated words.

\begin{align*}
\text{paman} & \quad [\text{paman}] \quad \text{‘tree (sp.)’} \\
\text{tamît} & \quad [\text{tamît}^\prime] \quad \text{‘healing’} \\
\text{tamôt} & \quad [\text{tamôt}^\prime] \quad \text{‘rat (sp.)’} \\
\text{caman} & \quad [\text{caman}] \quad \text{‘fruit of paman-tree’} \\
\text{kamôr} & \quad [\text{kamôr}] \quad \text{‘sand’} \\
\text{kwanôk} & \quad [k^\wedge anôk^\prime] \quad \text{‘moon’}
\end{align*}

A further series shows that \(k\^w\) is different from a sequence \(k\^o\) or \(k\^u:\)

\begin{align*}
\text{kwa} & \quad \text{‘chaff’} \\
\text{koå} & \quad \text{‘digging tool (k.o.)’ (plural: oå)} \\
\text{koá} & \quad \text{‘trees (sp.); sticks for beating’ (singular: poâ)} \\
\text{koá} & \quad \text{‘fruit of poâ-tree’ (plural: oå)} \\
\text{kua} & \quad \text{‘strand of hair’ (plural: tua)}
\end{align*}

\(^{14}\) I use \(kw\) (geminated: \(kkw\)) for the labialized velar oral consonant in the orthography.
Obstruent phoneme in word-final position

Obstruents in final position of isolated words are pronounced unreleased. They are restricted to t and k in words of Lumun origin.

- čít  [čí́t]  ‘eye’
- čík  [čík]  ‘place(s)’

Unreleased p and ţ sometimes occur word-finally in loans. Final ţ corresponds to different sounds in the source words.

- ʨáp  [ʧájá́p]  ‘friend’   (< Sud. Ar. ʂaahɪb)
- ำąpaccôt  [al]\(\beta\)acôt']  ‘jackal’   (< Sud. Ar. al-ba\(\text{shoob}\))
- mócců́t  [múců́t]  ‘comb’   (< Sud. Ar. mushu\(t\))
- mů́t  [mů́t̪]  ‘bananas’   (< Sud. Ar. mooz)
- ำápuríć  [al]\(\beta\)uríć]  ‘prayer mat’   (< Sud. Ar. al-birish)

Obstruent phoneme after a nasal

After a nasal, the phonemes p, ţ, t, c, k and kʷ are realized as voiced stops. These clusters are always homorganic:

- ʨüpů́l  [tumíl]  ‘rainbow’
-  uçě̂  [ʊ̂ndέ]  ‘wash’
- ำćînů́  [ćînd̪e]  ‘wrestle’
- ำćînce  [ćînce]  ‘nose’
- ำćîŋkí  [ćîngi]  ‘sun’
- ำćîŋkwat  [ćîngатур]  ‘sheep’

The same applies across a word-internal morpheme boundary and across word boundaries in connected speech: nasal and voiced stop are homorganic clusters.

Some examples follow here with an obstruent phoneme after the (moraic) prepositional proclitic (PPC) ń- ‘with, by, (away) from’. The PPC assimilates for its place of articulation to the following stop:
n-tacók  [n-dajók']  ‘on foot’ (lit.: with the legs) (< n- + tacók)
ɲ-caón  [ɲ-jaón]  ‘with the finger’  (< n- + caón)

Also across word boundaries it is the preceding nasal that, if necessary, adapts its place of articulation to the following obstruent (third example):

təllɔ̃n tešt  [təlɔ̃n dešt']  ‘the caterpillar (sp.) has gone’
kamarán kɔpol  [kʰmaráŋ ɡɔpol]  ‘the shield of the person’
cakkɔŋ cin  [cakɔŋ ʒin]  ‘my calabash (k.o.)’

I analyse root-internal sequences of a nasal and a stop as consonant sequences, not as prenasalization. Evidence for this is that there are no morpheme-initial nasal-and-stop sequences, for which reason syllable-initial nasal and stops are not expected either.15 Word-initial nasal and stops sequences do occur (some examples were given above), but they result from attachment of a nasal morpheme (ń- ‘with, by, (away) from’, or a nasal personal subject pronoun clitic). Such sequences are realized differently by different speakers. In the example below, some tend to pronounce a very short vowel ɪ [ɪ] before the nasal, others a sequence mb, again others pronounce the sequence very much as a single unit.

m-païk  [mβaïk'] [mbaïk'] [mβaïk']  ‘I am’

If root-internal nasal and stop clusters were typically preceded by a long vowel, this would traditionally have been seen as pointing towards prenasalization (causing compensatory lengthening) rather than towards an analysis as nasal and stop sequence (but see Downing 2005 for an alternative view). In Lumun, however, long vowels are not attested before nasal and stop clusters – on the

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15 I rarely use the notion ‘syllable’ since it plays no part in my analysis. I nevertheless did some syllabification exercises with some consultants, but these had inconsistent outcomes, also with one and the same speaker. Outcomes would sometimes go against syllabification principles: a few times a break was made between a consonant and a following vowel. JS tended to syllabify a nasal and stop sequence as an onset-cluster, both word-initially and word-medially.
contrary, the nasal of a nasal and stop sequence in some cases functions as the nucleus of the syllable that precedes the stop:

\textit{curant}ōk \([\text{kur\textsuperscript{ə}nduk}'], \text{[kur\textsuperscript{ə}nduk']}\) ‘small bell'

\textit{Obstruent phoneme between vowels}

Between vowels, non-geminated \(p, \, t, \, c, \, k\) and \(kw\) are phonetically realized as weakly articulated voiced fricatives ([β], [ð], [ʝ]) and approximants [ɰ] and [ɰʷ]).

\begin{itemize}
\item \textbf{kapik} \([\text{kaβik}']\) ‘rain’
\item \textbf{ɔtɔ} \([\text{ɔdɔ}]\) ‘pull’
\item \textbf{tacɔ} \([\text{taʝɔ}]\) ‘grass’
\item \textbf{ike} \([\text{iɯɛ}]\) ‘giraffe’
\item \textbf{ɔkwɔ} \([\text{iɯ'ɔ}]\) ‘blow’
\end{itemize}

The friction of especially [ʝ] is very light, almost absent, still there is clearly obstruction.

Intervocalic realization as voiced fricatives or approximants is also evidenced across morpheme and word boundaries. Some examples with the prepositional proclitic \textit{i}- ‘in':

\begin{itemize}
\item \textbf{1-parantąŋ} \([1-\text{barandąŋ}]\) ‘in the calabash (k.o.)’
\item \textbf{1-cakköŋ} \([1-\text{jakköŋ}]\) ‘in the calabash (k.o.)’
\item \textbf{1-kwɔk} \([1-\text{iɯ'ɔk}]\) ‘in the shoe’
\end{itemize}

Some examples with the enclitic question particle \textit{-i}:

\begin{itemize}
\item \textbf{alpaccōt}-i \([\text{al̩βacōd-}]\) ‘a jackal?’
\item \textbf{tuk-ǐ} \([\text{tȳuq-ǐ}]\) ‘a dog?’
\end{itemize}

Processes across morpheme-boundaries show that word-internally the phoneme \(t\) is realized as \(r\) between vowels. Note that, in the spelling, I use \(r\) for the intervocalic allophone of \(t\).
tué  [tué]  ‘river’
1-rué  [1-rué]  ‘in the river’

kít  [kít’]  ‘wild chicken’
kir-î  [kîr-î]  ‘a wild chicken?’

In the speech of JS, t and r are neutralized between (full) vowels. In that environment both are realized as [ɾ]. For NaA, however, this seems to be different (see further in 2.1.5 about rhotics).

Root-internal geminates

There are also root-internal voiceless stops between vowels. They are analysed as geminates. Some examples:

kapparí  [kapɽɾí]  ‘spoon’
cattak  [caʈʃak’]  ‘bowl’
tuttû  [tutʊ]  ‘dung’
cakkôn  [cakkɔŋ]  ‘calabash (k.o.)’
kukkwâ  [kuk“â]  ‘tool for threshing sorghum’

Evidence for an analysis as geminates comes from behaviour across morpheme boundaries, as exemplified below.

Adjacency of two identical or different obstruent phonemes across a morpheme boundary

Adjacency of two t’s or of two k’s results in a voiceless stop. The sound is underlyingly a geminate, but is pronounced short.

kwímmat tón  [kʷɪ’mːaː tór]  (< kwímmat tón)  ‘s/he saw us’
kaṭok kín  [kaɗu kîn]  ‘my spear’

Since p, t, c and kʷ do not occur word-finally (with a few exceptions for p and t) the adjacencies p-p, t-t, c-c and kʷ- kʷ are not attested across morpheme boundaries.
Adjacencies of t or k and another obstruent phoneme across a word-
internal morpheme boundary or a word boundary in connected
speech are realized as short voiceless stops. As a rule, such stops are
articulated at the place of articulation of the second composing
phoneme. Word-internally, I write adjacent obstruent phonemes as
geminates.

\[ t + p > pp \]
\[ mp \text{mm} \text{át paun} \] [mbim:á paun] ‘I saw a rat’

\[ t + t > tt \]
\[ t̠t̠aik (< ɪt- ŭaik) \] [ɪtaik’] ‘you and I are’

\[ t + c > cc \]
\[ cɔktɔcɔ ( < cɔktɔ cɔktɔ) \] [cʊɔɛʊɔt] ‘quickly’

\[ t + k > kk \]
\[ mp \text{mm} \text{ák} \text{kin} ( < mp \text{mm} \text{ák} \text{kin}) \] [mbim:á kin] ‘I saw them’

\[ t + kw > kkw \]
\[ mp \text{mm} \text{át kwa} \] [mbim:á kʷa] ‘I saw the chaff’

\[ k + p > pp \]
\[ mpaik paɛ̃ \] [mbai paj̥] ‘I am going’

\[ k + t > tt \]
\[ ɪt̠kəʊt-ɪtkəʊk ( < ɪtkəʊk ɪtkəʊk) \] [ɪtkʰʊ-ɪt̠kʰʊk] ‘butterfly’

\[ k + t > tt \]
\[ ɛːt-ʊkít ( < ɛːk- tʊk̚ɪt) \] [ɛːt-ʊw̃ɪt] ‘firstly, at first’

\[ k + c > cc \]
\[ ɛːk caik cɪɾ̩ma \] [ɛː caɪɾ̩ma] ‘it is getting dark’

Upon attachment of the phrasal enclitic -tɪ ‘you know’ (see also
17.2.3) a specific morphophonological rule applies. It is now the
place of articulation of the first composing phoneme that is dominant:

\[ k + t > kk \]

\[
\text{m-p-əká.t cık a-n-ıçat cık-kı (} < \text{cık + tı) }
\]

\[
1\text{-c-be:compl. vref conj-1-lie:down:depincompl. vref-you_know}
\]

I was lying down, you know

**Geminates in word-initial position**

Geminates also occur in word-initial position, but result then from concatenation of two morphemes: a common noun pronominal clitic and a concord. While in the following sentence \( p \) of \( pəŋtɛ \) and \( k \) of \( kəpä \) are realized as [β] and [u] respectively, the initial consonant of \( ppáɾəkə \) ‘he (the cat) will eat’ is realized as [p]. For this reason I write double \( p \):

\[
\text{pəlla p-əŋt.ɛ ittı p-p-áɾək̩k̩ kápå}
\]

\[
\text{cat c-like:compl. that pro-c-eat:incompl. meat}
\]

the cat wants to eat meat

**Obstruent phoneme before a nasal**

Across a morpheme boundary, an obstruent phoneme can precede a nasal. With a few exceptions, such sequences are pronounced as nasals which are articulated at the place of articulation of the nasal. Though geminates underlingly, they are pronounced short. That they are underlingly geminated is evidenced by the fact that the initial velar of the morpheme -ŋən (the plural marker of nouns with the persona prefix, discussed in 4.10.3) is not elided. If a preceding \( t \) or \( k \) would have been completely elided and \( η \) would be a singleton, it would undergo elision itself (see also under 2.1.3). Since word-internal intervocalic length of \( η \) is attested (though rarely) I write \( η \) as a singleton within the word:
A word-internal case that, in analogy to sequences t-ŋ and k-ŋ, can be regarded as full assimilation of an obstruent phoneme to a nasal across a morpheme boundary follows here. Here too, the resulting geminated nasal is pronounced short. Since there is an intervocalic length contrast for n (see 2.1.3), the resulting nasal is represented as a singleton.

Across word boundaries full assimilations of t or k to a following nasal followed by shortening of the nasal when the nasal-initial element is a noun (first and second example below), a pronoun (ex. 3), a question word (ex. 4), the concord n- (ex. 5), the prepositional proclitic na- ‘on, at’ attached to a common noun (ex. 6-7), or the absolute preposition nán ‘on, at’ (ex. 8):

\[
\text{m-p-} \text{immá} \cdot \text{t məpt} \quad [\text{mbimá mədɔt}] \\
\text{1-C-see:compl stars}
\]
I saw the stars

\[
\text{m-p-} \text{immá} \cdot \text{t nura} \quad [\text{mbimá nura}] \\
\text{1-C-see:compl bulls}
\]
I saw the bulls

\[
\text{m-p-} \text{immá} \cdot \text{t nón} \quad [\text{mbimá nón}] \\
\text{1-C-see:compl o2a}
\]
I saw you (Pl)

\[
\text{n}-\text{kw-} \text{ollíncé} \cdot \text{t nín-ta} \quad [\text{n̥wɔllíncé nǐnda}] \\
\text{2-C-run for:comp what-QW}
\]
why did you run?

\[
\text{nák} \quad \text{n-ş-öl} \quad [\text{ná nšol}] \\
\text{waterplaces C-of-people}
\]
the waterplaces of the people
a-kw-ákkakat nə-ppän [əu̯t̪'ákāwə̯ nɔ̃pən]  
CONJ-3-com:DEPPRFV on-room  
and s/he came into the room (the speaker is in the room)

m-p-immáť-ək nə-cařq̪̣g [mbimád̪̣ nɔ̃jɔ̱ŋ]  
1-C-see_at:COMPL-o3 on-mountain  
I saw him/her on the mountain

t̪ʊť̪t t-á.rattak̪t nán [t̪ɔ̯'tau̯c̪ n̪ən̪]  
food c-be_added:INCOMPL on:ABS  
the food will be added to it

What happens to t or k followed by m, n or ŋ could actually also be regarded as elision of t or k before m, n or ŋ. As explained above, this is not possible for t or k followed by ŋ. In analogy to the latter case, I regard all these cases as involving full assimilation followed by shortening. There is, moreover, one case in which (possible) t-nasal sequences tend to be realized with some length. It concerns the construction at-c-ut (or át-c-út) + c-numeral ‘both’, ‘all three’ (etc.) (see 10.4.2). Since some length tends to be pronounced, I write geminates:

namut án-n-ông-něřá ‘both rats (sp.)’

t and k realized as [r] and [u] before n

t and k are, however, realized differently before a word that starts with (an allomorph of) the prepositional clitic ŋ- ‘with, by, (away) from’, before ná ‘where’, and before nə- ‘on, at’ when it is attached to a (pro)noun or question word that has the persona prefix ŋ̪-. In these environments t and k are realized respectively as trill [r] and [u]. What causes these different realizations is not clear.

t and k before ŋ- ‘with, by, (away) from’

Examples follow here with t realized as [r] before ŋ- ‘with, by, (away) from’. In the first to third examples t is (part of) a verbal
infection marker, in the last example k is the final consonant of an object pronominal clitic.

\[\text{a-kw-ákkakat n-úţupa} \quad [\text{aужáкауąр нуţupa}]\]
and s/he came with the spirits

\[\text{a-kw-ákkakat n-tacők} \quad [\text{aужáкауąр ndajők}]\]
and s/he came on foot

\[\text{a-kw-ákkakat n-na-ppăn} \quad [\text{aужáкауąр нoţpăn}]\]
and s/he came out of the room (the speaker is outside the room)

\[\text{ollé p-оkícce.ř-ok n-tuăin} \quad [\text{олě βoцícérőř Ňďuăн}]\]
the husband has chased her out of the house

Before the locative relative ná ‘where’

Examples of t before ná ‘where’ follow here. It is unclear how ná should be analysed, as discussed in 11.3.

\[\text{ant-оkwárkot na} \quad [\text{андoухáри uc нa}]\]
\[\text{ŋ-kw-оnakkéř.č kůrrőř} \quad [\text{нáкáккéцč куůрц}]\]
please recall where you have put your stick

\[\text{m-p.a.něko kareť na-kakkā} \quad [\text{kěr нaцaккā}]\]
I will take the cloth to where Kakka is

Before nacter ‘on, at’ when attached to a noun or pronoun with the persona prefix š- or to the question word šita ‘who’:
By contrast, there is assimilation and shortening of the resulting geminate when t and k precede n- ‘on, at’ or the absolute preposition nán ‘on, at’. Examples of this were given earlier in this section. What brings about the difference is not clear.

Obstruent phoneme preceded by a lateral or rhotic: realization as voiced fricative/approximant

After l or r obstruent phonemes undergo lenition in the same way as between vowels. Evidence comes from across word boundaries. In word-final position l and r are attested. A very short schwa may be inserted between the lateral or rhotic and the following voiced fricative/approximant, except in a sequence r-t, which is realized as a (slightly longer, but not clearly long) trill (last example below).
Obstruent phoneme followed by l

In connected speech an obstruent phoneme is fully assimilated to l across a word boundary. Like nasals resulting from an obstruent-nasal sequence, the resulting lateral is realized short:

luŋkwat lešt [luŋʷa leš']  ‘the sheep (pl.) have gone’
ljćok lešt  [lico leš’t]  ‘the goats have gone’

Full assimilation of k before l is also attested in the following reduplication, again l is realized short. Since there is an intervocalic length contrast for l, the resulting lateral is represented as a singleton:

lakkəʁulákkəʁuk (< lakkəʁuk-lákkəʁuk)  ‘butterflies’

/t/ is, however, realized as a trill before l as allomorph before an l-initial noun of ŋ- ‘with, by (away) from’, as in the example below. The sequence of l’s can be realized here with a little length, but not necessarily so.

a-kw-ákkakat  l-łjćok  [auŋʷákaŋar lıjók’]
CONJ-3-comedePRFV  with-goats

and s/he came with the goats

Obstruent phoneme followed by w

Across a word boundary, a final phoneme t or k can be followed by w. In connected speech t and k are then realized as between vowels and w is deleted at the surface:

jimit  w-in  [imir ɪn]
goat  c-poss1

my goat

wək  w-ɑ-ʊl  [wɔŋ ɔul]
shoes  c-of-people

the shoes of the people
Word-internally these sequences are very rare. A sequence $t-w$ occurs in the reduplicated form of the adjective $c-\text{wkwít}$ ‘long’ when the concord is $w$:

\[
\text{arí w-úkwí́r-úkwít} \quad [w\text{ốw}ír\text{ốw}ít] \quad (\text{< wúkwít wûkwít})
\]

nails $c$-long-$c$.long

the nails are long

2.1.2. Remarks on $k^w$

Variation $k^w \sim k$ after a high back vowel ($u$ or $u$)

In word-medial position there is neutralization between $k^w$ and $k$ after $o$ or $u$, irrespective of whether the velar consonant is realized as a voiceless stop (when it is geminated), a voiced stop (after a nasal), or an approximant (between vowels). Some speakers pronounce the labialized velar, others the non-labialized. NaA used the variants with $k^w$, NiA the variants with $k$. JS tended to use the variants with $k$, but would, upon reflection, often prefer $k^w$. Some examples:

- $p\text{ốrükó} \quad \text{vs.} \quad p\text{ốrúkwó}$ ‘friend’
- $\text{ốrúkó} \quad \text{vs.} \quad \text{ốrúkwó}$ ‘hide’
- $t\text{ốká} \quad \text{vs.} \quad t\text{ốkwá}$ ‘head pad’ (for carrying heavy things)
- $\text{ốkká} \quad \text{vs.} \quad \text{ốkkwá}$ ‘become old’ (of people and animals)
- $\text{ốtôrukke} \quad \text{vs.} \quad \text{ốtôrûkkwe}$ ‘swallow’
- $\text{ tôŋkat} \quad \text{vs.} \quad \text{ tôŋkwat}$ ‘sheep’
- $\text{ tôŋke} \quad \text{vs.} \quad \text{ tôŋkwe}$ ‘liver’

The same is found in a borrowed word:

$c\text{ốkkar} \quad \text{vs.} \quad c\text{ốkkwar}$ ‘sugar’ ($\text{< Sud. Ar. sukkar}$)

Some Pluractional verbs are formed through insertion of $ukk$ or $ukkw$ before the final or last vowel (see chapter 13):

- $a\text{po}$ ‘fall’ $\quad a\text{poðkkwó}$ or $a\text{poðkk(w)ó}$ ‘fall with several bumps’
An exception is the adjective -ůkwít ‘long, tall, deep’. Though the labialized velar is preceded by u, there is no alternative pronunciation without labialization.

Only in a few cases kw and kkw are root or stem-internally preceded by another vowel than u or u. In these cases no alternative pronunciation with a non-labialized velar is available (unless in the incidental case that the labialized velar is followed by u or u, see further below). Examples:

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>cɔkwâ</td>
<td>‘breath’</td>
</tr>
<tr>
<td>ɔkwónc</td>
<td>‘produce’</td>
</tr>
<tr>
<td>akwa</td>
<td>‘okay’</td>
</tr>
<tr>
<td>aïkkwot</td>
<td>‘drive (animals) in different direction’</td>
</tr>
<tr>
<td>(also: aʊkkwot or aʊkkt</td>
<td>‘drive (animals) in different direction’</td>
</tr>
<tr>
<td>ñïkkwɔ</td>
<td>‘stir to solve lumps’</td>
</tr>
</tbody>
</table>

In the following words, with the vowel ɔ preceding, kkw and kk are contrastive:

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ɔkkwɔ</td>
<td>‘hit’</td>
</tr>
<tr>
<td>ɔkkɔ́</td>
<td>‘pass’</td>
</tr>
<tr>
<td>ɔkkwɔ́t</td>
<td>‘kill’ 16</td>
</tr>
<tr>
<td>ɔkkɔ́t</td>
<td>‘do, make’</td>
</tr>
</tbody>
</table>

There seem to be no cases of ŋkw preceded root-internally by another vowel than u or u. The vowel i precedes ŋkw in ŋkwɛl ‘in the hunting party’ and ŋkwâk ‘in the beer’, but these words are contractions of i- ‘in’ and kæmɛl ‘hunting party’ and ŋapak ‘beer’ (see chapter 4.4).

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16 In the speech of NiA there was lenition also in the words ɔkkwɔ ‘hit’ and ɔkkwɔ́t ‘kill’. They were pronounced as [ɔːkʰɔ] and [ɔːkʰɔt] respectively, with very weakly articulated ʰ, whereas they were pronounced as [ɔkʰɔ] and [ɔkʰɔt] by NaA and JS. No information is available about the pronunciation by NiA of other words with kk between vowels.
For some speakers there is a phonological restriction against a labialized velar consonant preceding \( \text{ʊ} \) or \( \text{u} \), but not for all. JS and NiA did not produce sequences \( \text{k}^w-\text{ʊ} \) or \( \text{k}^w-\text{u} \), and JS rejected the combination, but in the speech of NaA it is attested. There is, for example, speaker variation in the pronunciation of \( \text{ʊ} \) or \( \text{u} \)-initial verbs preceded by the 2\(^{nd} \) person singular pronoun clitic + concord (\( \eta-\text{kw}- \)), the third person pronoun clitic (\( \text{kw}- \)), and the third person pronoun clitic + concord (\( \text{kkw}- \)):

- \( \eta-\text{kw}-\text{όmm} \) vs. \( \eta-\text{k}-\text{όmm} \) ‘you will take’
- \( \text{a-kw}-\text{όrək} \) vs. \( \text{a-k-όrək} \) ‘and/while s/he gets up’
- \( \text{k-kw}-\text{όrək} \) vs. \( \text{k-k-όrək} \) ‘s/he will get up’

Variation was also found in a few lexical items:

- \( \text{aкóрд} \) vs. \( \text{аkвóрд} \) ‘move up’
- \( \text{аkуceд} \) vs. \( \text{akвúceд} \) ‘money’ (< Sud. Ar. \text{al-guruush})
- \( \text{kucúl} \) vs. \( \text{kwucúl} \) ‘back’

**Origins of \( \text{k}^w \)**

\( \text{k}^w \) has different origins in different words. In nouns, \( \text{k}^w \) as a noun class prefix may originate from reanalysis of a proto-Talodi plural noun class prefix \( \text{w} \) before \( \text{ɔ} \) as part of the stem, and, in a less consistent manner, before the vowels \( \text{a} \), \( \text{i} \) and \( \text{ɛ} \) (see chapter 4.3.1).

In words with stem-internal \( \text{k}^w \) preceding \( \text{ʊ} \) or \( \text{u} \), such as \( \text{purokв̂d} \) ‘friend’ (see above), the labialization of \( \text{k} \) may historically be a continuation of the preceding \( \text{ʊ} \) or \( \text{u} \). This is suggested by the relatively few cases with other stem-internal preceding vowels, while (seemingly) all cases of non-final (\( \eta \)\( \text{k} \)) preceded by \( \text{ʊ} \) or \( \text{u} \) allow for a labialized pronunciation (though not all speakers actually do this).

\( \text{k}^w \) incidentally arises from phenomena across morpheme boundaries. The 2\(^{nd} \) person singular pronoun clitic \( \eta \) + concord \( \text{p} \) combine to
ŋkw (see chapter 6.2.1). A labialized velar can also arise from prefixation of the prepositional clitics ɪ-, ɲo-, ɪɲ- or ɪɛ- to a noun with initial k and a labial consonant as onset of its second syllable, for example: ɨkkwón ‘in the field’ (< ɪ + kəpɔn), and ɪŋkwel ‘in the hunting party’ (< ɪ + kəmel) (see chapter 4.4 for a list of nouns that are contracted upon attachment of a PPC).

Other cases of labialization

The other obstruent phonemes do not occur labialized, or only rarely. ɪw is attested as a variant of ɪʊ in just two items, at least one of which is probably not originally Lumun.

ɪtʊaŋ ~ ɪttwǎŋ  very (also ɪttiəŋ)
attʊak ~ attwak  all, whole (probably a loan from Tocho)

2.1.3. The phonemes  mâ, n, ɲ and ŋ

The distribution of  mâ, n, ɲ and ŋ is presented in table 8. Parentheses signify that attestations in a certain position are rare. As with the obstruents, only the alveolar and velar phonemes occur word-finally in originally Lumun words.

<table>
<thead>
<tr>
<th></th>
<th>m</th>
<th>n</th>
<th>ɲ</th>
<th>ŋ</th>
</tr>
</thead>
<tbody>
<tr>
<td>word-initial</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>word-final</td>
<td>(+)</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>before an obstruent phoneme</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>between vowels</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Word-initial position

Series which substantiate the nasal phonemes and illustrate their distribution follow here. All nasals are found in initial position:

Table 8 Distribution of nasal phonemes in words
mopök ‘arrows’
ncı ‘cobras’
nepär ‘partridges’
nøre ‘laziness’

Initial ŋ is elided after a vowel. This can be seen across word-internal morpheme boundaries as well as, in connected speech, across word boundaries:

okkkó-ôn (< okkkö + -ŋôn) ‘Kokko and his companions’
akkä-ìn / aka-ìn (< akkä + ŋin) ‘why?’
a-úra … (< á- + ŋura) ‘and the bull …’
lípí lí-ura (< lo- + ŋura) ‘the horns of the bull’
ŋura ŋêšt [ŋura ešt’] ‘the bull has gone’

Initial ŋ is not elided when preceded by a nasal or obstruent phoneme. It is pronounced short, but considered underlyingly geminated, as explained in 2.1.1 Because there is a word-internal length contrast of ŋ (though rarely attested, see 2.1.3), the resulting nasal is written as a singleton:

ocño [ocño] ‘John and his companions’
(< ocño-ŋôn < ocño + -ŋôn)
ŋıtítıpt ŋın [ŋıtıtıtı ŋın] ‘my billy goat’
mpımmát ŋura [mpımmá ŋura] ‘I saw the bull’

Initial m, n and ŋ are not elided between vowels. For example:

nırupa ŋêšt [nırupa ešt’] ‘the lizards (sp.) have gone’

Word-final position

Word-final nasals are restricted to n and ŋ:

kařan ‘place’
kanáŋ ‘wind’
Final \( m \) just occurs in a few loans, for example:

\( \text{kálam} \)  ‘pen’ (< Sud. Ar. galam)

Unlike initial \( n \), final \( n \) is not deleted between vowels:

\( \text{ŋkomáŋ-} \) [ŋkomáŋ-] (< \( \text{ŋkomáŋ} \) + -i) ‘(is/was it) Kómaŋ?’

\( \text{ŋkomáŋ ŋ mpi} \) [ŋkomáŋ ŋmbi] ‘this Kómaŋ’

A nasal before an obstruent phoneme

All nasals can precede a phoneme \( p, t, t̪, c, k \) or \( kw \). Such clusters, whether root-internal, word-internal across morpheme-boundaries or across word boundaries in connected speech, are realized as a homorganic nasal + a voiced stop:

\( \text{cintāŋ} \) [cintāŋ] ‘bird (sp.)’

\( \text{m-pöl} \) [mböl] ‘with the person’ (< \( n- + pöl \))

\( \text{parantaŋ pīn} \) [parandam bīn] ‘my gourd’

Assimilation of the nasal for place of articulation to the following stop can also be seen in nouns with reduplication:

\( \text{pirimam-pīrīman} \) [pirimambīrīman] ‘spider’

\( \text{cian-cian} \) [cianhan] ‘seed (sp.)’

\( \text{kārīn-kārin} \) [kārīngkārin] ‘musical instrument (k.o.)’

\( \text{takkton-tākkon} \) [takkondakon] ‘mosquito’

Between vowels

Between vowels, all nasals are attested:

\( \text{ama} \) [ama] ‘be(come) hungry’

\( \text{ana} \) [ana] ‘and’

\( \text{pañ} \) [pañ] ‘open’

\( \text{ŋnt} \) [ŋnt] ‘like, want, love’
A labialized velar nasal

Between vowels [ŋʷ]17 is attested in three verbs (as well as in some of their derivations): ɘŋwɔt ‘keep’, ɘŋwɔ̀ ‘sing’ and ɘŋwɔ̀ ’kill’ (PLUR). The verbs with velar nasal form near-minimal pairs with the following verb:

ɘŋɔt [ɘŋɔt'] ‘like, want, love’

In table 4, I have therefore mentioned ɘ as a phoneme, but one with marginal status.

One word may seem to have [ŋʷ] as initial sound: the singular of ɘuf /ɘuf ‘milk’ (Ɂ[u]f, [ŋuf], [ŋwuf]). However, between vowels ʘ remains, so that a sequence ɘ·ʘ is the better analysis:

1-uf ‘in the milk’ ( < i + ɘuf)

Moreover, ɘuf is pronounced with a L and H tone, irrespective of whether the initial consonant sounds like a labialized velar nasal. L + H tones are not attested on nouns with a single vowel. Also for this reason it is better to analyse the initial consonant as ɘ, not ɘʷ.

Other labialized nasals are not attested.

Geminated nasals

There is root-internal intervocalic nasal length contrast for m and n as evidenced in some (near) minimal pairs. In such pairs, when pronounced next to each other, the length differences were clear. There may be root-internal length also for ʘ and ɘ (not ɘʷ) as well. In general, however, it seems that length is not necessarily realized. Length decisions were often difficult to make. A geminate was chosen if it was possible to hold the nasal a little longer and when speakers

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17 I use ɘw for the labialized velar nasal consonant in the orthography.
judged that the word fitted in better with words with a clearly long nasal than with words with a clearly short nasal.\(^{18}\)

Some examples of root-internal long nasals follow here. They are contrasted with word with short nasals, whether root-internally or across a morpheme boundary.

**Short versus long m**

- ɔm̥m̥ɛ́ ‘move asida’ (bring to mouth or pour on a plate)
- ɔm̥ɛ́ ‘tattoo’ (verb)
- ɪ̯m̥ma ‘see’
- ɪ̯m̥á ‘in heads’
- ɪ̯m̥ɛ́ ‘wash’
- c-ɪ̯m̥m̥ɛ́n ‘heavy’
- ɪ̯m̥ɛ́t ‘goat’
- ɔ̯mm̥a ‘take, pick (up)’ (one item)
- ɔ̯c̯ó̯m̥ɛ́ ‘take, pick (up) one by one’ (scattered items)

**Short versus long n**

- ɔ̯n̥n̥ɛ́ ‘help put a load on the head several times’
- ɔ̯n̥ɛ́ ‘help put a load on the head’
- ɔ̯nn̥ɛ́ ‘your mother’
- ɔ̯n̥a ‘bring’
- ɔ̯n̥n̥a ‘habitually bring’
- ɔ̯nn̥an ‘(his/her) mother’
- kunn̥ur ‘fruit of punnur-tree’
- kũ̯ũ ‘ear’
- cãnn̥an ‘very’
- kãn̥aŋ ‘wind’

\(^{18}\) Decisions are in most cases based on the speech and judgements of JS.
Short versus long ɲ

Whether or not there is an intervocalic length distinction for ɲ in roots was particularly difficult to establish, also because there are not many cases of intervocalic ɲ, whether singletons or geminates. In unpublished wordlists\(^{19}\), the words for ‘shoulder blade’, ‘wound’ and ‘singer’ are written with double ɲ, but contrasting them with similar words with short ɲ did not yield a length difference, except perhaps in the word ‘singer’.

\begin{verbatim}
cɪɲâ          ‘shoulder blade’
-ɪɲâ          ‘secrete itching fluid (poison)’
mɪɲâ          ‘shoulder blades’
mɪɲâ          ‘speed’
kʊɲi          ‘wound’
pɪɲɪl         ‘snake’
? pɪɲɲɪt      ‘singer’
kʊɲɪt         ‘rib’
\end{verbatim}

In the adverb ɛɲɲɛrmɪ ‘totally’ length of the palatal nasal ɲ is (probably) a matter of expressivity. ɲ can furthermore be pronounced with some length in the spatial demonstratives ɛɲɪ ‘this, these’ (near speaker), ɛɲɲɪrɪk ‘this, that, these, those’ (near addressee) and ɛɲɲɛrɛ ‘that, those’ (away from the speaker and the addressee). In these words, however, the long nasal is not root-internal but goes across a morpheme boundary (ɛɲɪ is an assimilation product with format en-c-ɪ, where the concord (C) is ɲ; ɛɲɲɪrɪk has the format en-c-ərɪk, and ɛɲɲɛrɛ the format en-c-ərɛ (see chapter 8.1)). Some nasal length can also be realized in aɲ-ɲ-ʊɲ-ɲɛrɛ ‘both’ modifying a noun of the ɲ-class, and other modifiers based on the format at-c-ʊt-c-numeral (át-c-ʊt-c-numeral) (see 10.4.2).

\(^{19}\) Kuku et al. (2006) and Lumun wordlist 25 February 2004.
 CHAPTER 2

Short versus long ŋ

There seems to be no root-internal length contrast of ŋ between vowels. In anŋanna ‘very’ the velar nasal has (or can have) length, but, like in āŋŋər̥iŋ ‘totally’, nasal length is (probably) due to expressivity. As discussed earlier, geminates caused by adjacency of an obstruent phoneme and a velar nasal do not result in nasals that are realized long (though underlyingly geminates). Moreover, in an item such as āpān̥n̥ ‘siblings’ (< āpāŋ + -ŋ̥n̥), too, the velar nasal across the morpheme boundary is realized short.

It is, however, possible to realize length of adjacent velar nasals across a word-internal morpheme boundary in the demonstratives ŋ-ŋ-i ‘this, these’ (near speaker), ŋ-ŋ-ər̥ik ‘this, that, these, those’ (near addressee) and ŋ-ŋ-ər̥ɪ ‘that, those’ (away from the speaker and the addressee). Notably, at-C-ut-C-numeral (át-C-út-C-numeral) (see 10.4.2) is not attested with the concord ŋ since this concord does not occur on plural nouns.

Word-initial nasal length

There is nasal length in word-initial position, due to attachment of the prepositional clitic ŋ- ‘with, by, (away) from’. In these cases length tends to be realized, especially in isolated words.

m-máṭṭak ‘with bowls’
n-naṭám ‘with books’
ŋ-naṭ̪oŋk̪ol ‘with calabashes (k.o.)’
ŋ-naṭ̪̅oŋk̪ol ‘with a calabash (k.o.)’

Some speakers realize a short vowel i before the clitic instead:

m-máṭṭak [m:áṭṭak̚], [ˈmᵃṭṭak̚] ‘with bowls’
ŋ-ŋ̥m [ŋ̥m], [ŋ̥m] ‘with, by’ (absolute preposition, see 16.6)

By contrast, a combination of a nasal common noun pronominal clitic (see 6.3) + concord (see 5.1), i.e. PRO-C, is pronounced without
length. In the first example below the common noun pronominal clitic n- pronominalizes, for example, namut ‘rats (sp.)’. The velar nasal in the second example is realized without length as well. At the word boundary I write the underlying form there (with a doubled velar nasal), in order to avoid the suggestion that the velar nasal can be deleted after a preceding vowel-final word.

n-ŋəŋkɔ́.t [nɔ́’ŋːɔ́tʼ]
PRO.C-eat:COMPL
they (the rats, sp.) have eaten it

ɔkɔ́l w-ɔŋekɔ́.t ŋəŋi aña ɲ-ɲ-ɪmmɪn
child c-take:COMPL water and PRO-C-heavy
the child carried the water and it was heavy

Nasals preceded by l or r

In connected speech, ɲ is typically elided after l or r across a word boundary. The other nasals can be elided in this position as well.

mʊpʊl mɪn [mʊβʊl mɪn], [mʊβʊl in] ‘my hats’
naŋaŋkal ɲɪn [naŋaŋgal ɲɪn], [naŋaŋgal ɪn] ‘my beds’
ŋʊkʊl ɲɪn [ŋʊqʊl ɲɪn], [ŋʊqʊl ɪn] ‘my children’
ŋʊcʊl ɲɪn [ŋʊcʊl ɪn] ‘my sauce’

mʊŋr ɲɪn [mʊŋr ɲɪn], [mʊŋr ɪn] ‘my young female goats/cows’
ɲɔ́r ɲaɪk [ɲɔ́r ɲaɪk’], [ɲɔ́r ɬaɪk’] ‘there is appetite’
ɲər ɲaɪk [ɲər ɬaɪk’] ‘there is mud’

Nasal after an obstruent phoneme

In the section on obstruent phonemes it was shown that, as a rule, a nasal causes full assimilation of a preceding obstruent phoneme, after which the geminated nasal is realized short. However, upon attachment of the enclitic discourse particles -na and -mɛ (see 17.2.2 and 17.2.4), a preceding obstruent phoneme assimilates only partially to the nasal: it becomes nasal but retains its place of articulation in the result. In both cases the resulting nasal is
pronounced short. Since there is word-internal length contrast of n and ŋ, I write the nasals as singletons.

\[\text{iřik.} \ ř \text{ki-ná} \quad (<\text{kít -na})\]

\text{tie:IMP} \quad \text{wild-chicken-ALLOW}

okay, but (then) tie the wild chicken (first)! (for example in response to “let’s go to the shop!”)

\[\text{iřik.} \ ř \text{takar-ŋá} \quad (<\text{takarúk -na})\]

\text{tie:IMP} \quad \text{chicken-ALLOW}

okay, but (then) tie the chicken (first)! (for example in response to “let’s go to the shop”)

\[\text{ana} \ ř \text{rít} \ ř \text{t-a.réko} \ ř \text{ŋáré} \ ř \text{ŋ-ôtté-i-ŋé} \quad (<\text{éticoik -mé})\]

\text{and} \quad \text{PERS-12} \quad \text{c-work:INCOMPL} \quad \text{work} \quad \text{c-little-VREF-PROP}

okay, shall we do a little work?

\text{Nasal before} \ l

Word-internally, no sequences of nasal + l are attested. Upon prefixation of ŋ- ‘with, by, (away) from’ to an l-initial noun, the nasal assimilates to l. The lateral can be pronounced with some length.

\[\text{l-lén ‘with words’} \quad (<\ ŋ- + lén)\]

In the example below, the final nasals (n and ŋ) of the first and second word tend to be elided before the following l:

\[\text{lén} \ ř \text{l-aŋ} \ ř \text{l-ôparšt} \quad [ló la lób̥'r̥st']\]

your words are good

2.1.4. The lateral phoneme l

l is articulated with the tip of the tongue against the alveolar ridge. The table gives its distribution in isolated words:
Table 9 Distribution of l in isolated words

<table>
<thead>
<tr>
<th></th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>word-initial</td>
<td>+</td>
</tr>
<tr>
<td>word-final</td>
<td>+</td>
</tr>
<tr>
<td>between vowels</td>
<td>+</td>
</tr>
</tbody>
</table>

l occurs contrastively in word-initial and word-final position:

lɔn  ‘words, matters, mouths’
tɔn  ‘mouth’

cǐl  ‘grain of sorghum’
cǐt  ‘eye’

Geminated l

Root-internally there are length differences, but it was often difficult to decide, also for the speakers, between single and geminated l. Geminated l can be pronounced short, but can also be held a little longer; it appears to be more common between vowels than short l.

Some words with short l:

calak  ‘neck’
cakkálık  ‘calabash (k.o.)’
kələk  ‘first stage of what becomes a fruit’
kulura  ‘shelter for goat’
kwalilín  ‘centipede’
ócóla  ‘become tasteless’
alokot  ‘surpass, defeat’
apərīlako  ‘hang (intr., from the hands)’

Some words with geminated l:

pəlla  ‘cat’
calle  ‘ball’
kəllân  ‘old woman’
Word-initially there is geminated l, resulting from attachment of the prepositional proclitic ŋ- ‘with, by (away) from’ (realized as l) before an l-initial noun, or from the common-noun pronominal proclitic l followed by concord l. Geminated l resulting from attachment of ŋ- ‘with, by, (away) from’ can be pronounced with some length. It contrasts with short l in word initial position:

l-łćök ‘with the goats’
lćök ‘goats’

Geminated l resulting from attachment of the common-noun pronominal proclitic l + concord l is pronounced short. Without antecedent, pronominal l is understood to refer to łon ‘words, matters’:

l-łpăršt (< l-łpăršt) [lśβryšt’] ‘it is good’

In other cases, too, underlying gemination across a morpheme boundary does not lead to the realization of length. The first example has a common noun pronominal proclitic (for example referring to łon ‘words, matters’) and concord:

lipił lín [lipi lín] ‘my horns (musical instrument)’

A case in which length may (but needs not) be pronounced is demonstrative əllf ‘these’, in which the second l is the concord, while the first l is underlyingly n (the frame is en-c-f).
In two lexemes, ʃ becomes ɽ, or can become ɽ, in intervocalic position across a morpheme boundary:

liccit    ‘threshing floor’
1-ciċcit    ‘on the threshing floor’
tɔ-riċcit    ‘on the edge of the threshing floor’

lɔn    ‘words, matters’
na-lɔn ~ na-ɽɔn    ‘about matters’

In the word ‘put down’ there is free variation between ʃ, l and n:

ɔɽəkket ~ ðəkket ~ ɔnəkket    ‘put down’

In the verb ‘close’ ʃ varies with n:

ʊɔkkwɔ ~ unʊkkwɔ    ‘close’

ʃ is robust when adjacent to another consonant. Examples were given under obstruent phonemes (2.1.1) and nasals (2.1.3). Also when adjacent to a rhotic, ʃ does not change, rather a very short schwa may be inserted:

lar ʃ-ɪn    [lar (ɔ)ɪn]    ‘my storage net’

2.1.5. The rhotics phonemes r and ɽ

Table 10 and 11 present the distribution and realization of the rhotics. The phoneme t is included because it has rhotic allophones. As exemplified in section 2.1.1 the rhotic allophone of t before certain nasal morphemes across a word boundary is different from the intervocalic allophone of t (table 11).

Table 10 Rhotics: distribution and realization in isolated words

<table>
<thead>
<tr>
<th></th>
<th>/r/</th>
<th>/ʃ/</th>
<th>/t/</th>
</tr>
</thead>
<tbody>
<tr>
<td>word-initial</td>
<td>–</td>
<td>–</td>
<td>[t]</td>
</tr>
<tr>
<td>word-final</td>
<td>ʃ~ [r]</td>
<td>–</td>
<td>[t’]</td>
</tr>
<tr>
<td>between vowels</td>
<td>ʃ, r</td>
<td>ʃ</td>
<td>r</td>
</tr>
</tbody>
</table>
Table 11 Rhotics: realization across a morpheme or word boundary

<table>
<thead>
<tr>
<th></th>
<th>r</th>
<th>r’</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>before certain nasal morphemes</td>
<td>[r]</td>
<td>–</td>
<td>[r]</td>
</tr>
</tbody>
</table>

_Geminated rhotics_

Word-medially r can be geminated. It is then realized as a long trill.

There is no geminated retroflex flap. r’ tends to geminate to ll, but gemination to rr is also attested. This can be seen in Pluractional verbs involving gemination, or partial reduplication and gemination (see also 13.1):

- **aɾc ɛk** ‘sleep, spend night’
- **alle ɛk** ‘habitually sleep, habitually spend night’
- **ʊɾɛ** ‘graze (animals)’
- **ʊpalle** ‘habitually graze (animals)’
- **ɾɛ** ‘say’
- **ɾɪlле** ‘habitually say’
- **ʊɾɛ́tʃò** ‘bite’
- **ʊkʊɭɛlɔ’habitually bite’
- **ʊɾʊtta** ‘be eaten’
- **ʊrʊtta** ‘be eaten (pl. subj. participants)’

_Word-initial position_

Rhotics do not occur in initial position in isolated words. A rhotic is always preceded by a vowel, if only a very short schwa:

- **əɾɛ́t** [‘ɾɛ́t’] ‘cloths’
- **əɾrɛ́o** [‘ɾɛ́o’] ‘push’
- **əɾtə** [‘ɾtə’] ‘refuse’

Word-initially there seems to be one exception to the restriction that r does not occur in initial position, since there is a word with an initial long trill:

- **rrɛppe** ‘illness caused by somebody who has twins’

However, this word appears to be underlyingly t-initial, since it takes t-concord:
the illness of the old woman is bad

For comparison, words with initial ə have the concord w- of vowel-initial nouns:

əret w-ə-kakkà ‘the cloths of Kakka’ [ərət wəkakə]

Word-final position

In word-final position only r is attested. In isolation the final rhotic can alternatively be pronounced long:

katôr [kaðôr], [kaðôr:]

Rhotics between vowels

Between vowels all rhotics occur. Some words contrasting r and rː intervocally follow here:

kara ‘tick’ karrə ‘lie’
kɔmarəŋ ‘shield’ karraŋ ‘wall’
curóćɔrə ‘fruit (k.o.)’ arrə ‘Lumun people’
ciɾi ‘wrist’ ciɾɾi ‘tick (sp.)’
ɔrə ‘cultivate’ ɔռə ‘habitually cultivate’
kɔɾə ‘left side’ kɔɾɾət ‘line’

However, there are differences between the speech of JS and NaA. For NaA there was a contrast between intervocalic [ɾ] and [r] in certain words in which JS did not perceive a contrast. In these words JS tended to pronounce [ɾ].

Table 12 Pronunciation of intervocalic rhotics

<table>
<thead>
<tr>
<th>NaA</th>
<th>JS</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ɾ]</td>
<td>carók ‘belly, stomach’</td>
</tr>
<tr>
<td>ŋura ‘bull’</td>
<td>ŋura ‘bull’</td>
</tr>
<tr>
<td>pira ‘tree’</td>
<td>pira ‘tree’</td>
</tr>
</tbody>
</table>
In the writing in this book, I do not represent the intervocalic rhotic contrast [ɾ] - [r] of NaA. The contrast was generally difficult to distinguish for me (both often sounded like a short trill to me) but appears to be supported by the following Pluractionals which involve gemination. The first case has the phoneme r, the second case, apparently, the intervocalic allophone of t ([ɾ]). For JS the r's in ṥrā ‘cultivate’ and in ṣkēro ‘trade’ are not different. Whether or not they are different for NaA I do not know.

<table>
<thead>
<tr>
<th>[ɾ]</th>
<th>ṣnurak ‘monkey’</th>
<th>[ɾ]</th>
<th>ṣnurak ‘monkey’</th>
</tr>
</thead>
<tbody>
<tr>
<td>kīrēk ‘hoe’</td>
<td>kīrēk ‘hoe’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>perō ‘tree’</td>
<td>perō ‘tree’</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notably, an intervocalic contrast between tap and trill as found in the speech of NaA is also reported for the closely related language Dagik (Vanderelst, personal communication). In the speech of NiA, like in the speech of JS, the contrast appears to be absent.

JS, however, does have a root-internal intervocalic trill which is not, or at least not clearly, a geminate. These cases have in common that they are preceded and/or followed by schwa. In slow speech, the schwas are more audible and the rhotic is no longer clearly a trill (as in the alternative phonetic transcription of the second and third example below):

- kur̥tut [kur̥tut] ‘bed plank (k.o.)’
- ṣkkāp̥r̥t̪ǎk̥o [kɑ̃β̥ɾ̥t̪ǎũp̥], [ɔkɑ̃β̥ɾ̥t̪ǎũp̥] ‘return’
- pɔr̥e [pr̥e], [p̥ɾ̥e] ‘monitor lizard’

In these cases it seems that the moraicity of schwa can (partly) be transferred to r. This does not happen in car̥k ‘belly, stomach’, a word with schwa as its last vowel and no schwa preceding r: here the rhotic is only pronounced as a tap.
**Realization of r across a morpheme boundary**

It is recalled here that, in connected speech, an obstruent phoneme is realized as a voiced fricative/approximant after r, while r is realized as short trill and a transitory schwa is inserted:

\[
\begin{align*}
\text{kaṭər} & \quad \text{k-ápe} & \quad [\text{kað̂r-ʔwáβe}] \\
& \quad \text{road} & \quad \text{c-wide}
\end{align*}
\]

the road is wide

Upon attachment of a (full) vowel to a word with final r, r is realized as a tap in the speech of JS\(^{20}\):

\[
\begin{align*}
\text{kaṭəɾ-ɨ} & \quad [\text{kað̂əɾ-ɨ}] & \quad \text{‘the road?’}
\end{align*}
\]

**Flap**

The retroflex flap ŋ has a very limited distribution. It occurs root-internally between vowels. Some words in order to substantiate phonemic status of ŋ are given below. ŋ is contrasted with l, t, and r.

\[
\begin{align*}
& \text{c-əɾɛk} & \quad \text{‘some’} \\
& \text{cəlɛk} & \quad \text{‘neck’} \\
& \text{kətət} & \quad \text{‘door’} \\
& \text{kəɾɛt} & \quad \text{‘cloth’}
\end{align*}
\]

ŋ is sometimes interchangeable with r:

\[
\begin{align*}
\text{ɲɛɾɛ} \sim \text{ɲɛɾɛ} & \quad \text{‘young girls’ (but in sg only ɲɛ ‘young girl’)} \\
\text{ɕɛɾɛ} \sim \text{ɕɛɾɛ} & \quad \text{‘peel’}
\end{align*}
\]

\(^{20}\) There may be differences between speakers in the realization of final r before an enclitic vowel. I have, however, no information about the pronunciation of NaA and NiA in such cases.
The phoneme \textit{w}

The distribution of \textit{w} is presented in the table below. \textit{w} occurs predominantly in word-initial position. In word-final position it is not attested. Except in some loans, it does not occur root-medially. At a morpheme boundary, its behaviour depends on its morphological status. As a concord (see chapter 5.1), \textit{w} is typically elided between vowels at a word-internal morpheme boundary, just like \textit{w} as a common noun subject pronominal clitic (chapter 6.3). As a noun class prefix, however, some speakers (among whom JS) retain \textit{w} between vowels at a word-internal morpheme boundary, while others delete it.

The table below gives the distribution of \textit{w} and its occurrence at a morpheme boundary upon attachment of a vowel-final prefix or clitic.

<table>
<thead>
<tr>
<th>\textbf{word-initial}</th>
<th>\textbf{word-internally between vowels}</th>
<th>\textbf{word-final}</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{w} +</td>
<td>–: not in roots, except in some loans</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>+ /–: as noun class prefix after a vowel at a morpheme boundary: not elided by some speakers, for others elision is possible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>–/(+): as a common noun subject pronominal clitic after a vowel at a morpheme boundary: commonly elided</td>
<td></td>
</tr>
<tr>
<td></td>
<td>–/(+): as a concord after a vowel at a morpheme boundary: commonly elided</td>
<td></td>
</tr>
</tbody>
</table>

Table 13 Distribution of \textit{w} and occurrence after a vowel-final prefix or clitic
Word-initial position

The following contrastive series substantiate the phonemic status of w. Some of the nouns with initial w have an alternative form without it (more examples are provided in chapter 4.3.1 on nouns). w as a noun class prefix can be pronounced as a consonantal glide, but also very vowel-like, as in the speech of NaA. Moreover, a word such as wěk tends to be whistled as bimoraic (LH), though not necessarily so. Even in the speech of NaA, however, there remains a difference between a vowel-like realization of the class-prefix w (phonetically represented as a vowel in superscript) and a full vowel ũ (or u) as found in verbal stems or nominal roots. w as a concord (or a pronominal clitic) is pronounced as a consonantal glide.

<table>
<thead>
<tr>
<th>Root</th>
<th>Phoneme</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ũet</td>
<td>[ʊetʰ]</td>
<td>‘make accept’</td>
</tr>
<tr>
<td>wět</td>
<td>[wɛtʰ]</td>
<td>‘bamboo circles of roof’</td>
</tr>
<tr>
<td>wěk</td>
<td>[wɛkʰ]</td>
<td>‘leg’</td>
</tr>
<tr>
<td>ũe</td>
<td>[ʊe]</td>
<td>‘undress’</td>
</tr>
<tr>
<td>wē</td>
<td>[wɨ]</td>
<td>‘calabash(es) or pot(s) for fermenting flour and water’</td>
</tr>
<tr>
<td>pē</td>
<td>[p̩e]</td>
<td>‘gum tree’</td>
</tr>
<tr>
<td>ũá</td>
<td>[ʊä]</td>
<td>‘fruits of pua-tree’</td>
</tr>
<tr>
<td>waį</td>
<td>[wäːi]</td>
<td>‘cow’</td>
</tr>
<tr>
<td>wanšk</td>
<td>[wanškʰ]</td>
<td>‘moons’ (also anšk)</td>
</tr>
<tr>
<td>w-aįk</td>
<td>[waikʰ]</td>
<td>‘C-is/are’</td>
</tr>
<tr>
<td>p-aįk</td>
<td>[paikʰ]</td>
<td>‘C-is/are’</td>
</tr>
<tr>
<td>ũo</td>
<td>[ʊo]</td>
<td>‘descend’</td>
</tr>
<tr>
<td>w-ɔ</td>
<td>[wɔ]</td>
<td>‘C-of’</td>
</tr>
<tr>
<td>wok</td>
<td>[wɔkʰ]</td>
<td>‘shoes’</td>
</tr>
<tr>
<td>pɔk</td>
<td>[pɔkʰ]</td>
<td>‘foam’</td>
</tr>
</tbody>
</table>

Root-internal intervocalic w

Root-internal w is only attested in a few loans from Arabic:
aláwa  ‘sweets’  (< Sud. Ar. ḥalaawa)
alawîr  ‘bush (sp.)’  (< Sud. Ar. al-awîr ‘the stupid’)
attáwa  ‘medicine’  (< Sud. Ar. ad-dawa)

w after a vowel or nasal across a word-internal morpheme boundary

As a noun class prefix w is not elided in intervocalic position across a morpheme boundary by some speakers:

/ɪ-waĩ/  ‘in the cow’
/ɪ-wet/  ‘between the bamboo circles of the roof’
ciri cɔ-wɛk  ‘the ankle (lit.: the joint of the leg)’

Reportedly, however, other speakers would elide noun class prefix w between vowels, for example:

/ɪ-aĩ/  ‘in the cow’

Some w-initial nouns have an alternative form without w. In such nouns, w is commonly absent when word-internally preceded by a vowel, but not necessarily:

/ɪ-allĩr/  ‘in the gazelle’
/ɪ-wallĩr/  ‘in the gazelle’

The nouns waĩ ‘cow’, wet ‘bamboo circles of roof’ and wɛk ‘leg’ do not have an alternative form without w. Upon prefixation of ſ- ‘with, by, (away) from’ to these nouns, w fully assimilates, resulting in a nasal which can be pronounced with some length:

/n-naĩ/  ‘with the cow’
n-nɛk  ‘with the leg’

The pronoun clitic w- is commonly elided word-internally between vowels, unless in careful speech:
The concord w- is commonly elided word-internally between vowels, though in carefully articulated speech it may be pronounced:

```
aun 1-eṣ.t  (< 1-w-eṣt)  
rats  RES-(C-)go:COMPL
```

the rats which have gone

**Noun class prefix w and concord w across word boundaries**

In the speech of JS, w as a noun class prefix remains unaffected by a preceding vowel across a word boundary (first example below) and causes a preceding t or k to elide in connected speech (second example below):

```
mpakāta waj  ‘I will look at/after the cow’
mpimmát wék  ‘I saw the leg’  [mbim:á wék’]
```

Reportedly, in the speech of others, t before w may be realized as [ɾ] while w is deleted:

```
mpimmát wék  ‘I saw the leg’  [mbim:ár ék’]
```

As a concord, w tends to be elided in connected speech across a word boundary after a vowel, as well as after n, ŋ, l and r:

```
waj w-aát  [wai aát’]  ‘the cow has come’
wak w-skakká  [wan ŋakák]  ‘the hair of Kakka’
onjós w-erá  [onjós erá]  ‘two walls’
ol w-erá  [ol erá]  ‘two persons’
atar w-erá  [atar erá]  ‘two roads’
```

In connected speech, the concord w causes a preceding t to be realized as its intervocalic allophone [ɾ] and a preceding k to be
realized as its intervocalic allophone [uɬ]. After [ɾ] w is elided, whereas after [uɬ] it can be elided but not necessarily so:

\[ \text{ɪt} \quad \text{w-a.ɪk} \quad \text{w-ɪmma} \quad [ɪɾ \text{ aɪɬ wɪmːa}], [ɪɾ \text{ aɪɬ ɪmːa}] \]

the wild chickens are seeing it

In general, elision of the concord w across the word boundary is common, but does not seem to be obligatory for the speech to sound natural.

**Geminated w**

Geminated w is not attested in roots, but can result, across a morpheme boundary, from a combination of common-noun pronominal w and concord w. The sequence is realized short. There is no elision between vowels, apparently not even before an u- or u-initial stem.

\[ \text{ʊkʊl} \quad \text{w-ʊŋ.ɛ} \quad \text{ɪtɪ} \quad \text{w-ʊkkwɔ} \quad [ʊŋвуɬ ʊŋ.ɛ ɪtɪ wʊkkwɔ] \]

the child wants to dance

**Two different w’s?**

The different intervocalic behaviour of the noun class prefix w- on the one hand, and the common noun subject pronominal clitic w- and concord w- on the other hand, suggests that they do not have the same phonological status. w as a noun class prefix can perhaps be interpreted as the realization of a vowel u or u that was considered part of the nominal root in a preceding stage, and became reanalysed (again) as a consonantal prefix (compare chapter 4.3.1). w as a concord patterns with the other concords, which are all consonants. The behaviour of w as a noun class prefix would be largely in line with the behaviour of high back vowels, which do not elide under the influence of a preceding sound, while the behaviour of w as a concord would be more in line with the behaviour of consonants, several of which are susceptible to (partial) assimilation or elision
(and particularly ŋ between vowels). However, a noun with an initial vowel would not undergo a change from prefixation of ŋ- ‘with, by, (away) from’, but a noun with initial w does. As shown above, w assimilates to proclitic ŋ- ‘with, by, (away, from). How the differences can be explained would need further investigation.

2.1.7. The palatal glide [j]

The word for ‘my mother’ has two variants: with [j] and with [ʝ]. The latter realization is spelled as <ɪ>. In this case, [j] is a further lenition of the intervocalic allophone of c ([ʝ]).

ɔcáca   [ojája]   ‘my mother’
ɔtáia   [ojája]   ‘my mother’

[j] is in some cases the realization of a vowel. In a sequence of three vowels aeɔ, e is realized as [j], though in careful speech it can be realized as e. The verb in the first example below is related to the noun ɲae ‘urine’. The second example is the (irregular) Incompletive TAM of the verb ɛɔ ̂ ‘go’.

ɲñáɛ5   [ɔɲːjɔ̃]   ‘urinate’
m-p-ae5   [mbajɔ̃]   ‘I will go’

2.1.8. Rare sounds

Sibilants and voiceless fricatives do not belong to the regular sound inventory of Lumun. NiA nevertheless pronounced [s] in the word ‘green’:

kareṭ    k-ícɛf    [kícɛf], [kísf]
cloth    c-green
the cloth is green

Sibilants are also found in some words used for chasing away or calling animals. An example is sula, which is used for calling a dog. A few more examples with sibilants used for the calling or chasing away of specific animals can be found in chapter 17.3. There is
furthermore an animal call with [ʕ] (fēn, for calling a pig), and a word with [h] (hau) for chasing away a dog. [ŋ] occurs in a sound symbolic word expressing the sudden appearance of something, attōθ.

2.1.9. Consonant clusters

As mentioned earlier, Lumun has nasal-stop clusters:

\[
\begin{align*}
\text{mp} & \text{ [mb], } \\
\text{nt} & \text{ [nd], } \\
\text{nc} & \text{ [ŋj], } \\
\text{ŋk} & \text{ [ŋg], and } \\
\text{ŋkw} & \text{ [ŋg\text{”}].}
\end{align*}
\]

Nasal-stop clusters occur word-initially and word-medially. A word-medial example:

\[
\begin{align*}
\text{kɪɲc} & \text{ ‘nose’}
\end{align*}
\]

In word-initial position they result from attachment of one of the nasal proclitics ŋ- ‘with, by, (away) from’, ŋ- ‘I’, ŋ- ‘you (SG)’, ŋ- ‘you (PL)’ or ŋ- ‘they’ to a word with an initial obstruent phoneme. These nasals can be moraic. Some speakers tend to pronounce a short i [i] before the cluster, others realize it rather like a prenasalized consonant, particularly when there is no tonal difference between the proclitic and the following mora, as in the first example below. Phonetic approximations accompany the examples below.

\[
\begin{align*}
\text{m-p-immāt} & \text{ [m’bim:ət’], [mbim:ət’], [’mbim:ət’]} \\
1-C-see:COMPL & \\
\text{I saw (it)}
\end{align*}
\]

\[
\begin{align*}
\text{m-pōl} & \text{ [mbōl], [’mbōl]} \\
\text{with-person}
\end{align*}
\]

\[
\begin{align*}
\text{with the person}
\end{align*}
\]

**Seeming consonant clusters: separated by ə**

In other cases, consonants sequences may sound like a cluster, but I analyse them as separated by schwa because they always involve a tone-bearing unit, as appears from tone whistling. Schwa is
sometimes audible, sometimes hardly so. The following types of near-clusters occur word-initially. Preceding a geminated rhotic, lateral or nasal, the moraicity of \( \alpha \) can be transferred to this rhotic, lateral or nasal.

**obstruent and lateral:**

*palla*  
\[p^{\hat{\alpha}}l\alpha\], \([p\alpha]\)  
‘cat’

*kəllān*  
\[k^{\hat{\alpha}}l\alpha\ːn\], \([k\alpha\alpha]\)  
‘old woman’

**obstruent and rhotic:**

*pərən*  
\[p^{\hat{\alpha}}\rhoən\], \([p\rhoən]\)  
‘finally’

*kərət*  
\[k^{\hat{\alpha}}ɾət\]’, \([k\rhoət]\)  
‘cloth’

**obstruent and nasal:**

*pənən*  
\[p^{\hat{\alpha}}n\alpha\]  
‘woman without children’

*kəməl*  
\[k^{\hat{\alpha}}m\alpha\]  
‘hunting party’

**nasal and rhotic:**

*ŋət̚i*  
\[ŋ^{\hat{\alpha}}t̚i\], \([ŋ\alpha\alpha]\)  
‘water’

**nasal and lateral:**

*mələmələ*  
\[m^{\hat{\alpha}}ləm^{\hat{\alpha}}lə\]  
‘a little’

*nələkkər*  
\[ŋ^{\hat{\alpha}}ləkkər\], \([ŋ\alpha\alpha\kər]\)  
‘sorghum (k.o.)’

Tone movements also show that these consonants do not form consonant clusters, but are separated by \( \alpha \). Upon prefixation of \( \hat{n}- \) ‘with, by, (away) from’ a High tone is realized on the first mora of a word to which it is attached, unless the second mora has itself a High tone. Upon prefixation of \( n\hat{o}- \) ‘on, at’ or \( r\hat{i}- \) ‘in’ a High tone is realized on the second mora, unless there is a third mora which itself has a High tone. The example below shows that \( pr \) is not a consonant cluster, but contains a moraic element.
There are some further near consonant clusters that occur in word-medial position. In some of these cases, the moraicity of schwa may be transferred to the preceding l or rhotic, which is not necessarily geminated. In some cases schwa is more audible than in others. Some of these words with near consonant clusters are Arabic loans which include the article al-.

**lateral and voiceless stop:**

\[
\begin{align*}
\text{ołókket} & \quad [\text{ɒl̩'kɛt'}] & \quad \text{‘put down’} \\
\text{aləppéra} & \quad [\text{al̩'pɛɾa}], [\text{alpɛɾa}] & \quad \text{‘flag’ (}< \text{Sud. Ar. al-beerag})
\end{align*}
\]

**rhotic and voiceless stop:**

\[
\begin{align*}
\text{ɔrróttə} & \quad [\text{ɔɾʈa}], [\text{ɔɾʈa}] & \quad \text{‘be eaten (plural subject)’}
\end{align*}
\]

**lateral and voiced fricative or approximant:**

\[
\begin{align*}
\text{aləpaccɔt} & \quad [\text{al̩'βacɔt'}], [\text{alβacɔt'}] & \quad \text{‘jackal’ (< Sud. Ar. al-βa'ʃhoob)} \\
\text{aləkarrɛ} & \quad [\text{al̩'uqarrɛ}], [\text{ałuqarrɛ}] & \quad \text{‘old coin of ten piasters’}
\end{align*}
\]

**rhotic and voiced fricative or approximant:**

\[
\begin{align*}
\text{ɔɾəkɔ} & \quad [\text{ɔɾ'upɔ}] & \quad \text{‘eat’}
\end{align*}
\]

**lateral and nasal:**

\[
\begin{align*}
\text{aləmɔntu} & \quad [\text{al̩'mɔndu}], [\text{almɔndu}] & \quad \text{‘gun’ (< Sud. Ar. al-bundugîyya)}
\end{align*}
\]

**rhotic and nasal:**

\[
\begin{align*}
\text{mɔɾəmɔɾ} & \quad [\text{mor'mɔɾ}], [\text{mɔɾmɔɾ}] & \quad \text{‘eight’} \\
\text{curəntuq} & \quad [\text{kur'nduq'}], [\text{kurnduq'}] & \quad \text{‘small bell’}
\end{align*}
\]
rhotic and lateral:

corallópa  [kurˈliːbə], [kurliːba]  ‘sorghum stem’

2.2. Vowels

Lumun has eight vowel phonemes: ɨ, i, u, ʊ, e, ɔ, a, ə. 21

2.2.1. Contrastive series

Minimal pairs and near minimal pairs provide evidence for the contrastive status of ɨ, i, e, a, ɔ, ʊ and u.

ɨ versus i

kît  [kît]  ‘eyes’
kît  [kît]  ‘wild chicken’

iɾɪko  [iɾiwo]  ‘tie’
iɾɪko  [iɾiwo]  ‘enter’

ɔkiɔ  [oʨio]  ‘drive together (of cattle)’
ɔkiɔ  [oʨio]  ‘cut’

u versus ʊ

kua  [kua]  ‘strand of hair’
koâ  [koâ]  ‘digging tool’

ŋuɾû  [ŋuɾu]  ‘asida’
ŋuɾo  [ŋuɾo]  ‘dirt’

uno  [uno]  ‘pour’
ono  [ono]  ‘build’

21 Kutsch Lojenga also analysed eight vowel phonemes (unpublished notes of 2004).
### ɛ versus ɪ, Ɂ and ɔ

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>cɛn</td>
<td>[cɛn]</td>
<td>‘palm fruit’</td>
</tr>
<tr>
<td>cɪn</td>
<td>[cɪn]</td>
<td>‘egg’</td>
</tr>
<tr>
<td>cɨn</td>
<td>[cɨn]</td>
<td>‘thigh’</td>
</tr>
<tr>
<td>ɛ̃</td>
<td>[ɛ̃]</td>
<td>‘go’</td>
</tr>
<tr>
<td>ɔ</td>
<td>[ɔ]</td>
<td>‘die’</td>
</tr>
<tr>
<td>ɨ</td>
<td>[ɨ]</td>
<td>‘set fire to’</td>
</tr>
<tr>
<td>cɛ临港</td>
<td>[cɛ临港]</td>
<td>‘middle of body’</td>
</tr>
<tr>
<td>cɔ临港</td>
<td>[cɔ临港]</td>
<td>‘mountain, hill’</td>
</tr>
</tbody>
</table>

### ɔ versus ū

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>kəpɔn</td>
<td>[kəpɔn]</td>
<td>‘farming field’</td>
</tr>
<tr>
<td>k-ɔpɔn</td>
<td>[k-ɔpɔn]</td>
<td>‘bitter’</td>
</tr>
<tr>
<td>ɔrɑ</td>
<td>[ɔrɑ]</td>
<td>‘cultivate’</td>
</tr>
<tr>
<td>ɔra</td>
<td>[ɔra]</td>
<td>‘escape’</td>
</tr>
</tbody>
</table>

### a versus e and ɔ

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>mɑn</td>
<td>[mɑn]</td>
<td>‘house’</td>
</tr>
<tr>
<td>mɛn</td>
<td>[mɛn]</td>
<td>‘palm fruits’</td>
</tr>
<tr>
<td>ɔra</td>
<td>[ɔra]</td>
<td>‘escape’</td>
</tr>
<tr>
<td>ʊre</td>
<td>[ʊre]</td>
<td>‘forget’</td>
</tr>
<tr>
<td>tɑr</td>
<td>[tɑr]</td>
<td>‘net for storage’</td>
</tr>
<tr>
<td>tɔr</td>
<td>[tɔr]</td>
<td>‘appetite’</td>
</tr>
<tr>
<td>ɔllɑ</td>
<td>[ɔllɑ]</td>
<td>‘wipe away’</td>
</tr>
<tr>
<td>ɔllɔ</td>
<td>[ɔllɔ]</td>
<td>‘run’</td>
</tr>
</tbody>
</table>
Contrastive series involving ə

The vowel ə is contrasted with i, ɪ, u, ʊ, a, ɛ, ɔ and zero in the examples below. ə is often realized very short and is often co-articulated with an adjacent vowel (more details are given in 2.2.3). ə contrasts with zero only word-initially, but not before a rhotic sound, because rhotics do not occur word-initially.

<table>
<thead>
<tr>
<th>example</th>
<th>phoneme</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ærrə</td>
<td>[əɾ]</td>
<td>‘shoot’</td>
</tr>
<tr>
<td>jirə</td>
<td>[iɾə]</td>
<td>‘jump’</td>
</tr>
<tr>
<td>nəɾi</td>
<td>[ɲɾɪ]</td>
<td>‘water’</td>
</tr>
<tr>
<td>nəli</td>
<td>[ɲil]</td>
<td>‘leadership’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>example</th>
<th>phoneme</th>
<th>meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>cəmmɔn</td>
<td>[cəmɔn]</td>
<td>‘caterpillar (sp.)’</td>
</tr>
<tr>
<td>cummun</td>
<td>[cumun]</td>
<td>‘owl’</td>
</tr>
<tr>
<td>capɔ</td>
<td>[caβo]</td>
<td>‘hole in the ground’</td>
</tr>
<tr>
<td>cupɔ</td>
<td>[cuβo]</td>
<td>‘fruit of pupú-tree’</td>
</tr>
<tr>
<td>capɔ</td>
<td>[caβo]</td>
<td>‘ground’</td>
</tr>
<tr>
<td>ñpa</td>
<td>[ɲpa]</td>
<td>large bowl for preparing beer</td>
</tr>
<tr>
<td>paa</td>
<td>[paː]</td>
<td>grapevine</td>
</tr>
<tr>
<td>pərɛ</td>
<td>[pɾɛ]</td>
<td>‘monitor lizard’</td>
</tr>
<tr>
<td>perɛ</td>
<td>[pɛɾɛ]</td>
<td>‘chest’</td>
</tr>
<tr>
<td>atən</td>
<td>[ədən]</td>
<td>‘wild felines (sp.)’</td>
</tr>
<tr>
<td>atən</td>
<td>[ədən]</td>
<td>‘baskets (k.o.)’</td>
</tr>
<tr>
<td>kaɾan</td>
<td>[kaɾan]</td>
<td>‘name’</td>
</tr>
<tr>
<td>kaɾan</td>
<td>[kaɾan]</td>
<td>‘place’</td>
</tr>
<tr>
<td>tɔɾák</td>
<td>[tɔɾák]</td>
<td>‘rope’</td>
</tr>
<tr>
<td>tɔɾák</td>
<td>[tɔɾák]</td>
<td>‘war’</td>
</tr>
</tbody>
</table>
2.2.2. ATR (Advanced tongue root)

In minimal pairs the difference between ʊ and u and particularly between i and ɨ is clearly distinguishable. In their production in minimal pairs, JS perceives a clear difference as well, describing the articulation of ɨ and u as involving a ‘kind of pushing from the throat’ and ‘tension in the head’, in general requiring some special effort as compared to the articulation of i and ʊ. The same contrast exists between the allophonic variants of ɛ and ɔ: [ɛ] and [ɔ] on the one hand, and [e] and [o] on the other hand. This suggests a kind of tense/lax opposition, with ɨ, u, [e] and [o] having a tense articulation, and i, ʊ, [ɛ] and [ɔ].

There are, furthermore, some vowel harmony effects that are typical for advanced tongue root (ATR) systems. As shown in this chapter, roots contain only vowels from one set, while at least in some affixes, i, u, ɛ and ɔ tend to be raised, at least a little, towards ɨ, u, [e] and [o] by ɨ or u in the root. This is precisely compatible with a so-called 8-vowel 2IU- ATR harmony system (Casali 2008). In Lumun the vowel a is not involved in vowel harmony, which is attested in some other 7 or 8-vowel 2IU languages as well. a is a special case since it is realized in different ways in different environments, due to co-articulation.

The vowel harmony effects point towards advanced tongue root (+ATR) articulations of ɨ and u, and [e] and [o], though there seems to be no clear association between +ATR and ‘tense’, and –ATR and ‘lax’ (Ladefoged & Maddieson 1996); in some Nilotic languages there is even rather the opposite association (Tucker 1970). In western Nilotic languages there is, moreover, an association of +ATR with breathy voice (Hall & Creider 1998, p. 47-48), which is not found in Lumun.

How the high and mid vowels are precisely articulated in Lumun remains somewhat unclear, but it seems accurate to describe them in terms of ATR.
However, except in ATR-minimal pairs, the contrast seems to be on its way out. For several words, though articulated laxed rather than tensed, it was difficult to decide whether the vowels would best be qualified as –ATR or as +ATR. They seemed kind of “in-between”: +ATR as compared to clear –ATR examples, but –ATR as compared to clear +ATR examples. In addition, judgments could also be inconsistent, not only between speakers, but also by one and the same speaker. Cases which were not really clear but which I decided to represent as +ATR, because they seemed to be articulated more towards +ATR than towards –ATR include the following:


2.2.3. Phonetic realizations of ø

The vowel ø (schwa) is characterized by its variety in surface appearances. Its length varies from ultra-short to normal vowel-length, its quality from a schwa-like central vowel to the colour of a vowel in an adjacent syllable, often the following.

**length of ø**

ø can often be realized as ultra-short, so that consonants surrounding it nearly form a consonant cluster (see 2.1.9). It was also shown that the moraicity of ø can be realized on an adjacent lateral, rhotic or nasal. Between a voiceless plosive and a rhotic the vowel tends to be less audible than between a voiced fricative/approximant and a rhotic. Compare:

| Καππάρι | [kapɔɾi], [kapɔɾ], ‘spoon’ | L.L.H |
| Καπσάλ | [kaβɔɾal] | ‘apron’ | L.L.L |

In initial position it is short but clearly audible:

| Óριτ | [’ɾɪt] | ‘granaries’ |
| Óραν | [’ɾaŋ] | ‘names’ |
In a closed final syllable, ə often sounds like a full vowel, particularly when the final consonant is an obstruent:

- **carók** [carók] ‘belly, stomach’
- **cakót** [cauqát] ‘toe’ (also: **cakát** [cauqát])

*quality of ə*

In the absence of other vowels, ə is realized as a central mid vowel:

- **tapák** [təpæk] ‘forked stick’
- **attañ** [‘tæŋ] ‘again’
- **tammâk** [‘təmək] ‘bark of tree’

ə also has a central quality if it occurs in a root-final syllable. In such cases, root-internally preceding vowels are, if not ə as well, a or ø:

- **cakót** [cauqát] ‘toe’
- **carók** [carók] ‘belly, stomach’
- **karəŋ** [kaɾəŋ] ‘place’
- **kaṭär** [kaðəɾ] ‘road’
- **cəɾəɾ** [cəɾəɾ] ‘young goat’

When preceded by a syllable containing u or ø, ə adopts the quality of this preceding vowel:

- **kʊɾəɾti** [kʊɾʔəɾti] ‘leaf of popu-tree’
- **kʊɾəɾta** [kʊɾʔəɾa] ‘bamboo needle’
- **ʊɾəɾle** [ʊɾʔəɾle] ‘habitually graze (animals)’

If not preceded by u or ø, ə adapts to the vowel in the stem-internal following syllable when this is high vowel (i, i, u, o):

- **pəɾɪk** [pɾɪk] ‘big, important’
- **ŋarəkkoŋ** [ŋarəkkoŋ] ‘baby’

In case of a following mid-vowel (e, ø), ə can take on the quality of this vowel, but also be realized as a central vowel:
With a in the stem-internal following syllable, ə is realized as a central vowel:

**alla**  
[ələ]  
‘cats’

When the following syllable contains a vowel sequence, ə tends to adapt to the second vowel of the sequence, though not necessarily always:

**cammɔ́n**  
[kɛrmɔ̀n]  
‘caterpillar (sp.)’

**pɔ́llie**  
[ɔpɔ̀lje], [ɔpɔ̀lje]  
‘frighten’

**ɔkɔ́tɔ́t**  
[ɔkɔ̀tɔ́t'], [ɔkɔ̀tɔ́t']  
‘squeeze’

### 2.2.4. Distribution of ə

The distribution of ə is different from the distribution of the other vowels. It is absent from monomoraic words, does not occur word-finally and is not part of root-internal vowel sequences. No sequences kwə are attested.

Another observation is that many longer words (four or more morae) contain a schwa. It seems that, in longer words, vowel reduction is at play. Vowel reduction can be witnessed in derivations with a combination of the Reciprocal suffix -arə and the Benefactive suffix (i)nə. The initial vowel of the Benefactive suffix, realized as ə when attached to a verb with final or last vowel ə, is now reduced to ə:

**ɔkkət** ‘do, make’ + arə + me > ɔkkəɾəntət ‘do for e.o., make for e.o.’

A case which suggests reduction is the verb ɔkətə ‘look at’ vs. its Imperative kaṭa ‘look!’.

In (indirect) loans from Arabic which are borrowed together with the Arabic article al, schwa is an inserted vowel solving a consonant
cluster that is not allowed. This means that schwa is inserted between ă and any following consonant, except when this is another ă. For example:

*alakkóppa* ‘basket’ (< Sud. Arabic al-guffa)

*alamóntu* ‘gun’ (< Sud. Arabic al-bundugíyya)

2.2.5. Co-occurrence restrictions of vowels in roots

The same vowels can co-occur in a root, but there are some restrictions to the co-occurrence of different vowels. Root-internally ĭ and ŭ can co-occur, and ĭ and ŭ (irrespective of which vowel comes first), but not ĭ and ĭ, ĭ and ŭ, ŭ and ŭ, or u and ĭ (irrespective of which vowel comes first). The vowels a and ã can co-occur with all other vowels (i, ĭ, u, o, e and œ), but in the case of ã this is not vice versa: the high vowels and e do not precede ã root-internally. [e] and [o] do not occur in roots unless ĭ or u is present in the root as well.

Combinations of vowels in roots with two morae are presented in the table below. The first vowels are set out on the vertical axis, the second on the horizontal axis. (-) means that a combination was not attested, but that this does not seem structural, occurrences would in principle be possible.

Table 14 Vowel combinations in lexical roots

<table>
<thead>
<tr>
<th></th>
<th>ĭ</th>
<th>ĭ</th>
<th>u</th>
<th>o</th>
<th>ơ</th>
<th>e</th>
<th>a</th>
<th>ã</th>
</tr>
</thead>
<tbody>
<tr>
<td>ĭ</td>
<td>+</td>
<td>-</td>
<td>(-)</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>ĭ</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>u</td>
<td>+</td>
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2.2.6. Harmony effects across morpheme boundaries

ε, ɔ and ɪ in affixes tend to (somewhat) harmonize with a +ATR lexical root, being realized as, or towards, [e], [o] and [i] respectively. No cases are attested of a +ATR lexical root and ʊ in an affix. a in an affix is not affected by a +ATR lexical root.

As far as ə occurs in affixes, it is typically realized very short, such as in the allomorph -ənɛ of the Benefactive suffix -ɪnɛ (see 14.1). As far as there would be some colouring of ə this will be determined by an adjacent vowel, irrespective of its ATR-quality.

Some examples of verb stems follow here. They consist of a root and final vowel. The final vowel is –ATR by default, but harmonizes with a +ATR value of the verbal root:

- əɾɛkə [əɾɛwə] ‘work’
- ɨɾɪko [ɨɾɯ̞pə] ‘enter’
- ɨɾɨko [ɨɾiɯ̞ʊ̞] ‘tie’
- ɨɾɛ [ɨɾɛ] ‘say’
- ɨɾɛ [ɨɾe] ‘thresh’

Harmonization of affix vowels has in particular been observed in derivational suffixes, for example in Causative -ɪɛ:

- ɨɾɨk-ɪɛ [ɨɾɪɥɛ] ‘make enter’
- ɨɾɨk-ɪɛ [ɨɾɨɥiɛ] ‘make tie’
- ʊn-ɪɛ [ʊnɪɛ] ‘make build’
- un-ɪɛ [unie] ‘make pour’

The Passive morpheme -ak does not block harmonization of the final vowel, nor of the vowels of the Benefactive suffix -(ɪ)ne. The derivations below are based respectively on ona ‘build’ and una ‘pour’:

- on-akə [unauɾpə] ‘be built’
- on-ak-ɪne [unauɾɪne] ‘be built for’
- un-akə [unauɾo] ‘be poured’
- un-ak-ɪne [unauɾɪne] ‘be poured for’
Verbal inflectional suffixes tend to have variable realization. There can be (some) harmonization to +ATR root vowels, but not necessarily so. [i], [i] and qualities in-between were found as realizations of the Imperative suffix -ɪ attached to a +ATR verbal root. The Completive suffix -ɛ of t-final verbs tended to be realized as [ɛ] irrespective of the ATR quality of the verbal root.

The adnominal prefix ɔ- (the persona prefix) and the plural suffix -ŋɔn tend to harmonize (somewhat) upon attachment to a +ATR element.

Clitics such as the prepositional proclitics, connexive (c-ɔ) and the restrictor (r-) seem to undergo little or no change under influence of a +ATR lexical root. The same goes for the enclitic question marker (-ɪ) and the enclitic discourse markers -tı and -mé.

Two clitics have themselves +ATR vowels: the 1PL exclusive subject pronominal pro-clitic (iın-) and the 1PL exclusive object pronominal enclitic (-ıın). Both do not influence the vowel(s) of the verbal roots or stems to which they are attached.

One verb has +ATR mid-vowels though neither i nor u is present. This verb has a labialized velar (kw). The +ATR realization of ɔ in ‘fetch’ can be explained from the labialization being the realization of an underlying (+ATR) vowel u.

ɔkkwɔ [okʷɔ] ‘hit’
ɔkkwɔ [okʷɔ] ‘fetch’

The picture of the Lumun vowel system is that of a +ATR root-dominant 8-vowel harmony system with ATR contrast only in the high vowels - but a system in which the ATR-factor is on the retreat. Though the contrast remains clear in minimal pairs, it was difficult in several other cases to decide upon the ATR-qualities of the vowels. Harmonizing effects were found, but could be weak in some cases, or also absent.
Like Lumun, the Talodi languages Tocho, Acheron and Dagik have 8-vowel systems with (ATR-)contrast in the high vowels (i vs. ĩ and o vs. u), as did the probably extinct language Torona (Tocho: Kuku Alaki & Norton (2013); Acheron: Norton (2013); Dagik: Vanderelst (2013); Torona: Norton & Kuku Alaki (2015). Norton and Kuku Alaki remark that in Torona, like in Lumun, there is tendency for loss of the + ATR value in the high vowels (p. 103).

2.2.7. Vowel sequences

*Long vowels: sequences of identical vowels*

Root-internal long vowels are rare. The following nouns have a long vowel, which may have arisen from loss of a consonant (ŋ?) in between:

- ḉaák/phaák  ‘oil’
- ṭaák/laák  ‘sesame paste’
- ṇeɛ/peeɛ  ‘poison’
- tuōn/noōn  ‘shovel (k.o.)’
- paa/kaaa  ‘grape (plant sp.)’
- caa/maaa  ‘fruit of paa’

There is one case in a longer noun:

- ṭuoolí/luoolí  ‘hyena’

One adjective (possibly) has a long vowel:

- c-ecná  ‘such, like this/that’

In the case of īi ‘yes’ (answer to a polar question), length can be explained from avoidance of words that consist of just a single vowel.22

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22 Probably for the same reason, ka ‘body’ does not have a plural *a ‘bodies’ in the plural ∅ class.
Non-derived verbs with a long vowel are ɛɛ ‘stab, blow’ and ɔɔ ‘cry’. ɔɔ ‘cry’ can be analysed as consisting of a root (the first vowel) and a final vowel (the second) which is not part of the root, just like other verbs ending in ɔ (see 12.4.1). Some Pluractionals have a long initial vowel as compared to their non-Pluractional counterparts, for example:

ʊɔ ‘descend’ ʊʊɔ ‘habitually descend’

Vowel length generally results from two vowels coming together across a morpheme boundary. These vowels may have been the same in the first place, or one has assimilated to the other. In the following example a long vowel results from attachment of the Benefactive morpheme -ɪnɛ which replaces the final vowel ɔ:

ɪ-ɔ ‘die’ ɪ-ɪnɛ [ɪnɛ] ‘die for’

Long a is further attested in some inflected forms of the verb əɔ ‘come’. The Completive of əɔ with proclitic third person singular pronoun + concord forms a minimal pair with the noun ‘stranger’:

kkwáát ‘s/he has come’ kwát ‘stranger’

A morpheme that gives rise to a long vowel in a word is the irrealis marker ā, which is attached between the concord and the —always vowel-initial— verb stem:

ʊl w-á-aná.t ɲəpak
people C-IRR-bring:COMPL beer
the people would have brought beer (but now they did not)

In combination with the Completive of ‘come’ an extra-long vowel results:

kkw-á-aát ‘s/he should have come’

Attachment of vowel-final proclitics may result in an (underlyingly) long vowel, as may attachment of vowel-initial enclitics. In the first
example, there is elision of noun-initial ŋ upon prefixation of ɪ ‘in’. I write double vowels in the cases below, though length is not necessarily realized.

**ɪ-iḵè**  \(< ɪ + ŋike\)

in the flood

**pʊl ɪ-p-šparí-ɪ**  \(< ɪpóparí + -ɪ\)

person řēs-c-female-qua

(is / was it) a woman?

Though there are actually a few cases of true minimal pairs in roots (kaa ‘grapes’ versus ka ‘body, bodies’; caa/maa ‘fruit(s) of paa’ versus cá/má ‘head(s)), I do not consider long vowels as monophonemic units in Lumun. In the great majority of cases, long vowels can be analysed as a vowel sequence caused by adjacent morphemes, and an analysis of the long vowel as a sequence of two identical phonemes is therefore preferred.

Length of a sequence of identical vowels is often hardly or not audible unless in slow or carefully articulated speech. The vowels of some prefixes and suffixes tend to remain more audible than the vowel of other prefixes and suffixes, for which reason I write some sequences with a long vowel, and others with a short vowel.

**Diphthongs: sequences of different vowels**

Root-internal diphthongs are not frequent. The table below presents the cases attested in nouns, including borrowed nouns. The first vowels are set out on the vertical axis, the second on the horizontal axis. The attestations vary from 1 (ai, oi, ei, ae, ea, ao), to 10 (ai) and 16 (ia). The separate vowel qualities are largely retained.

**Table 15 Diphthongs in nominal roots**

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<th>I</th>
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<th>o</th>
<th>ɛ/[e]</th>
<th>ɔ/ [o]</th>
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<td>–</td>
<td>ɛe</td>
<td>ɔ</td>
<td>–</td>
<td>ia</td>
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</table>
Examples:

\begin{verbatim}
je kiê ‘cows’          re tokunjíen ‘bee (sp., small)’
ió miá ‘spell’           ia comian ‘bone’
ua tua ‘hair (of animal)’  oí nóf ‘milk’
œe tóe ‘river’            oa coán ‘rat (sp.)’
êi opé ‘child (of X)’     ée téd ‘beard’
œo tallóon ‘caterpillar (sp.)’ aï wai ‘cow’
ai karí ‘nail, claw, louse’  ao paun ‘rat’
æeₙaε ‘urine’              æoₙ paₙ ‘tree (sp.)’
\end{verbatim}

Just as I analyse long vowels as sequences of identical vowels, I analyse diphthongs as sequences of different vowels.

2.2.8. Vowel sequences across morpheme boundaries

Across morpheme boundaries and in connected speech there can be coalescence between adjacent vowels. There are general coalescence tendencies, but if and how coalescence takes place depends on the morphemes involved. Coalesced vowels often result in a short vowel, but generally also allow for a pronunciation with some length. This also goes for adjacent same vowels.

In some cases there is little to no shortening. The vowel resulting from attachment of prepositional proclitic -i- to an i (or ï) -initial noun typically retains length, as do vowels resulting from attachment of the question markers -i, -a and -e (chapter 20.2) and the discourse marker -a (chapter 17.2.1). In those cases, I write a double vowel word-internally. In other cases, I write a single vowel word-internally, though realization with some length is generally possible.
Sequences ɔ-e, ɔ-a and a-ɔ typically coalesce across a word-internal morpheme boundary as well as across a word boundary in connected speech, while sequences involving a high vowel (i, u, i, u) or schwa (ə) often (but not always) result in a diphthong. Some examples of coalescence as well of absence of coalescence will be given here, involving sequences ɔ-a and a-ɔ. Details are further found in the sections discussing the morphemes involved.

ɔ-a

Attachment of the connexive marker C-ɔ to an a-initial noun results in a vowel a. The vowel will generally be realized short, but can in careful speech be pronounced with some length.

karró  k-árró  (< k-ɔ + arró)

mother_tongue  c-of.Lumun_people

the mother tongue of the Lumun people

The same happens with no ‘on, at’ followed by an a-initial noun. The resulting vowel a tends to be pronounced with some length (see also 16.3.2).

ɔtte  na-apê  (< nɔ + apê)

leave:IMP  on-fish(PL)

leave the fish(PL) behind!

Also the persona prefix ɔ- before an a-initial noun results in (short) a:

ámra ‘Red’  (< ɔ- + ámra)

In connected speech verb-final ɔ followed by an a-initial noun is realized as a:

k-kw-á.ŋwó  ápê  [kwán̩-áβê]

3-C-kill.PLUR:INCOMPL  fish(PL)

s/he catches fish (lit. s/he kills fish)
A word-internal sequence ɔa is, however, attested in the Past and Dependent Perfective of the verb ɔɔ ‘cry’:

... akwó-at ‘... and s/he cried’

Coalescence is absent upon attachment of the question particle -a and the discourse particle -a. An example of the latter follows here:

\( \text{m-p-éí} \quad \text{p-á,é-á} \)

1-C-be\_NEARSP C-GO\_INCOMPL\_ATT

I am going!

In the word for the Lumun homeland coalescence of ɔ + a has resulted not in a but in ɔ:

\( \text{torrò} \ (< \text{ta-} \text{‘up on, up at’} + \text{arrò} \ ‘Lumun people’) \)

a-ɔ

a-ɔ becomes a upon attachment of the proclitic conjunctive particle á to a noun with initial ɔ:

... a-laló ōmentet ól ñtī ... (á + claló)

CONJ\_Lalu TELL\_PLUR\_DEF\_INCOMPL people that

... and Lalu was always saying to people ...

When an a-final verb is followed by an ɔ-initial noun, irrespective of whether this ɔ is the persona prefix or belongs to the nominal root, ɔ results in connected speech:

\( \text{m-p-a.ik} \quad \text{p-a.kétta} \quad \text{ɔ-kókkó ɲ.ɲɛ́} \quad \text{[pauçét-ɔ̄kukó]} \)

1-C-be\_PR 1-C-be\_shaved\_INCOMPL PERS\_Kókkó WITH\_ABS

I am being shaved by Kókkó

\( \text{ɲ-kw-ímma} \quad \text{ɔcáŋ} \quad \text{[ŋw̃ímː-ɔcáŋ]} \)

2-C-see\_INCOMPL lizards

you will see the lizards
The sequence aɔ is attested in the verb aɔ ‘come’, which consist of a root a and final vowel ɔ.

Some further details of vowel coalescence across morpheme boundaries are found in the chapters and sections describing specific morphemes.

2.2.9. Nasalization

In some words the vowels are or can be nasalized. In the verbs eê ‘stab, blow’, eɔ ‘go’ and ŋéac ‘urinate’ the vowels can be pronounced nasalized, in certain TAMs of the verb ‘go’ this is even generally the case. When a word is pronounced nasalized, the nasalization spreads over the immediately preceding vowel(s). No or little nasalization seems to take place if the vowels are not in word-final position, as, for example in e̥tta ‘be stabbéd’ and mpeɔt ‘I am gone’.

A noun which is nasalized is mĩɔ ‘spell’. ā ā [ʔáʔã] ‘no’ is also nasalized.