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A grammar of Lumun : a Kordofanian language of Sudan

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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 (ɪ-). 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 (ʒ-) and the plural suffix (-ɲɔ̃n). The prepositional elements ɪ- ‘in’, nɔ- ‘on, at’, tɔ- ‘up on, up at’, ʔɔ- ‘at’ and ɲ- ‘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 **-ta**.

Some enclitic particles are not restricted to a certain word category. The question clitics **-i**, **-a** and **-ε** (chapter 20.2) and the discourse clitics **-a**, **-ti**, **-mé** and **-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 **Ṭṛṭi**. Some additional remarks are made on the basis of the speech of Nafisa Abdullai (NaA) from **Ṭṛṛəmaṭṣṇ**, and Nimeri Alemin (NiA) from **Ṭəumân**, both uphill settlements. Nimeri Alemin speaks with more lenition, assimilation and elision than Nafisa Abdullai, 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 **Ṭṛṛəmaṭṣṇ** on the one hand, and **Ṭəumân** and **Ṭaṛu** on the other hand. Inhabitants of **Ṭəumân** and **Ṭaṛu** typically speak very fast, while several of the speakers from **Ṭṛṛəmaṭṣṇ** speak somewhat slower and more articulated. It appears that there is no stereotypical picture of the speech of **Ṭṛṭi**, possibly due to its more heterogeneous population: Lumun people from different uphill places have settled in **Ṭṛṭi**.

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 **ŋ^w** indicate its marginal status.

Table 4 Consonant phonemes

	<i>bilabial</i>	<i>dental</i>	<i>alveolar</i>	<i>retro- flex</i>	<i>palatal</i>	<i>velar</i>	<i>labialized velar</i>
obstruents	p	t̪	t		c	k	k ^w
nasals	m		n		ɲ	ŋ	(ŋ ^w)
rhotics			r	ɽ			
lateral			l				
approx- imant							w

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 5 Phonetic consonants

	<i>bilabial</i>	<i>dental</i>	<i>alveolar</i>	<i>retroflex</i>	<i>palatal</i>	<i>velar</i>	<i>labialized velar</i>
voiceless plosives	p	t̪	t		c	k	k ^w
voiced plosives	b	d̪	d		ɟ	g	g ^w
voiced fricatives	β	ð			j		
approx- imants					(j)	ɰ	ɰ ^w w
nasals	m, m:	ɳ	n, n:		ɲ, (ɲ:)	ŋ, (ŋ:)	(ŋ ^w)
rhotics			ɾ, ɾ, ɾ:	ɽ			
lateral			l, l:				

2.1.1. The phonemes **p**, **t̚**, **t**, **c**, **k** and **kʷ**

The phonemes **p**, **t̚**, **t**, **c**, **k** and **kʷ** 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 **t̚** in word-final position indicate that the phoneme is rare in that position.

Table 6 Allophones and distribution of **p**, **t̚**, **t**, **c**, **k** and **kʷ** in isolated words

	/p/	/t̚/	/t/	/c/	/k/	/kʷ/
word-initial and as geminate	[p]	[t̚]	[t]	[c]	[k]	[kʷ]
word-final		([t̚])	[tʰ]		[kʰ]	
after a nasal	[b]	[d̪]	[d]	[j]	[g]	[gʷ]
between vowels	[β]	[ð]	[ɾ]	[j]	[ɰ]	[ɰʷ]
before a nasal			[N]*		[N]*	

*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**, **t̚**, **t**, **c**, **k** and **kʷ** in additional environments in connected speech across word boundaries

	/p/	/t̚/	/t/	/c/	/k/	/kʷ/
before certain nasal-initial words			[ɾ]		[ɰ]	
after l or r	[β]	[ð]	[ɾ], [r]	[j]	[ɰ]	[ɰʷ]

Articulation of dental and alveolar stops

The difference between [t̪] and [t], [t̪ʰ] and [tʰ], and [d̪] and [d], respectively, is a difference of both the active articulator and the target area. [t̪], [t̪ʰ] and [d̪] are lamino-dental: they are articulated with the blade of the tongue touching the teeth but not becoming visible, whereas [t], [tʰ] and [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, t̪, t, c, k** and **kʷ** 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, t̪, t, c, k** and **kʷ**¹⁴, and illustrate their pronunciation as voiceless stops in initial position of isolated words.

paman	[paman]	‘tree (sp.)’
ṭamít	[ṭamítʰ]	‘healing’
tamot	[tamotʰ]	‘rat (sp.)’
caman	[caman]	‘fruit of paman-tree’
kamór	[kamór]	‘sand’
kwanôk	[kʷanôkʰ]	‘moon’

A further series shows that **kw** is different from a sequence **ku** or **ku**:

kwa	‘chaff’
kuâ	‘digging tool (k.o.)’ (plural: uâ)
kuá	‘trees (sp.); sticks for beating’ (singular: puá)
kuá	‘fruit of <i>pua</i> -tree’ (plural: uá)
kua	‘strand of hair’ (plural: tua)

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.

cít	[cít̚]	‘eye’
cĭk	[cĭk̚]	‘place(s)’

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

ɔcâp	[ɔjâp̚]	‘friend’	(< Sud. Ar. <i>ṣaḥīb</i>)
aləpaccôṭ̚	[alʰβacôṭ̚]	‘jackal’	(< Sud. Ar. <i>al-baʿshoob</i>)
múccuṭ̚	[múcuṭ̚]	‘comb’	(< Sud. Ar. <i>mushuṭ</i>)
môṭ̚	[môṭ̚]	‘bananas’	(< Sud. Ar. <i>mooz</i>)
aləpıríṭ̚	[alʰβıríṭ̚]	‘prayer mat’	(< Sud. Ar. <i>al-birish</i>)

Obstruent phoneme after a nasal

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

ṭumpĭl	[ṭumbĭl]	‘rainbow’
ɔnṭê	[ɔndê]	‘wash’
ɔcĭntɔ	[ɔjĭndɔ]	‘wrestle’
kɪncɛ	[kɪɲɛ]	‘nose’
cɪɲkɪ	[cɪɲgi]	‘sun’
ṭuɲkwat	[ṭuɲgʷat̚]	‘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-dajókʰ]	‘on foot’ (lit.: with the legs) (< ń- + tacók)
ɲ-caón	[ɲ-jaón]	‘with the finger’ (< ń- + caón)

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

təllɔn tɛt	[tʰl:ɔn dɛtʰ]	‘the caterpillar (sp.) has gone’
kəmaráj kɔpɔl	[kʰmaráj ɡɔβɔl]	‘the shield of the person’
cakókɔ ɕm	[cakókɔ ɲm]	‘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-paík	[ˈmbaíkʰ] [mbaíkʰ] [ᵐbaíkʰ]	‘I am’
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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

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:

cʊrən̩tʊk [cʊr^an̩ðʊk^ˀ], [cʊr^an̩ðʊk^ˀ] ‘small bell’

Obstruent phoneme between vowels

Between vowels, non-geminated **p**, **t**, **c**, **k** and **kw** are phonetically realized as weakly articulated voiced fricatives ([β], [ð], [ɹ]) and approximants [ʋ] and [ʋ^w].

kapík	[kaβík ^ˀ]	‘rain’
ɔt̪ɔ̃	[ɔðɔ̃]	‘pull’
tacɔ	[taɹɔ]	‘grass’
íkɛ	[ɪʋɛ]	‘giraffe’
ɔkwɔ̃	[ɔʋ ^w ɔ̃]	‘blow’

The friction of especially [ɹ] 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 **ɪ-** ‘in’:

ɪ-parantán̩	[ɪ-βarandán̩]	‘in the calabash (k.o.)’
ɪ-cakk̩ɔ̃	[ɪ-ɹak̩ɔ̃]	‘in the calabash (k.o.)’
ɪ-kwɔ̃k	[ɪ-ʋ ^w ɔ̃k ^ˀ]	‘in the shoe’

Some examples with the enclitic question particle **-ɪ**:

aləpaccúɫ-ɪ	[al ^a βacúð-ɪ]	‘a jackal?’
tuk-ĩ	[tūʋ-ĩ]	‘a dog?’

Processes across morpheme-boundaries show that word-internally the phoneme **t** is realized as **ɹ** between vowels. Note that, in the spelling, I use **ɹ** for the intervocalic allophone of **t**.

tué	[tué]	‘river’
i-rué	[i-rué]	‘in the river’
kīt	[kīt̚]	‘wild chicken’
kīr-ĩ	[kīr-ĩ]	‘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:

kappəɾĩ	[kap̚ˈɾĩ]	‘spoon’
caṭṭak	[caṭak̚]	‘bowl’
tuttû	[tutû]	‘dung’
cakkôŋ	[cakôŋ]	‘calabash (k.o.)’
kukkwâ	[kok̚ˈwâ]	‘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.

kwímmát tón	[k̚ˈwím̚ːá tón]	(< kwímmat tón)	‘s/he saw us’
kaṭok kîn	[kaṭ̚o kîn]		‘my spear’

Since **p**, **t̚**, **c** and **k̚** do not occur word-finally (with a few exceptions for **p** and **t̚**) the adjacencies **p-p**, **t̚-t̚**, **c-c** and **k̚-k̚** 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

mpɪmmát paʊn [mbɪm:á paʊn] ‘I saw a rat’

t + t̪ > tt̪

ɪtt̪aɪk̪ (< **ýt- ɬaɪk̪**) [ɪtt̪aɪk̪] ‘you and I are’

t + c > cc

cəkəccəkət (< **cəkət cəkət**) [cəpəcəpət] ‘quickly’

t + k > kk

mpɪmmák kɪn (< **mpɪmmât kɪn**) [mbɪm:á kɪn] ‘I saw them’

t + kw > kkʷ

mpɪmmát kwa [mbɪm:á kʷa] ‘I saw the chaff’

k + p > pp

mpaɪk̪ pæj̯ [mbaɪ pæj̯] ‘I am going’

k + t̪ > tt̪

ɬakkəʊt̪-ɬákkəʊk̪ (< **ɬakkəʊk̪ ɬákkəʊk̪**)
[ɬak̪ʊt̪-ɬákk̪ʊk̪] ‘butterfly’

k + t > tt

cɪt-tókɪt (< **cík- tókɪt**) [cɪ-tókɪt] ‘firstly, at first’

k + c > cc

cɪk caɪk cɪɪma [cɪ caɪ cɪɪma] ‘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

m-p-əká.t cɪk a-n-ɟcat cɪk-kɪ (< **cɪk + tɪ**)
 1-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 **pəŋəʔé** and **k** of **kəpá** are realized as [β] and [w] respectively, the initial consonant of **ppárəkó** ‘he (the cat) will eat’ is realized as [p]. For this reason I write double **p**:

pəlla p-əŋəʔ.é itti p-p-á.ɾəkó kəpá
 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 underlyingly, they are pronounced short. That they are underlyingly geminated is evidenced by the fact that the initial velar of the morpheme **-ŋɔ̃n** (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 **ŋ** would be a singleton, it would undergo elision itself (see also under 2.1.3). Since word-internal intervocalic length of **ŋ** is attested (though rarely) I write **ŋ** as a singleton within the word:

၁ပု-၇၇ (< ၁ပု၇-၇၇ < **၁ပု** -၇၇) ‘servants, masters’
၁ခခခခခခခ-၇၇ (< ၁ခခခခခခခ-၇၇ < **၁ခခခခခခခ** -၇၇) ‘Hunchback
 and his companions’

A word-internal case that, in analogy to sequences **t-၇** and **k-၇**, 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.

ငါ-နဝ-နုတုတု (**ငါ**- **နဝ**- **နုတုတု**) ‘(right) at the meeting circle’

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 **နဝ-** ‘on, at’ attached to a common noun (ex. 6-7), or the absolute preposition **နာ** ‘on, at’ (ex. 8):

m-p-immá.t **məṭṭət** [mbɪm:á məṭṭət̚]
 1-C-see:COMPL stars
 I saw the stars

m-p-immá.t **ṇura** [mbɪm:á ṇura]
 1-C-see:COMPL bulls
 I saw the bulls

m-p-immá.t **ṇón** [mbɪm:á ṇón]
 1-C-see:COMPL O2A
 I saw you (PL)

၇-kw-၁လ်လ်.တ **၇ဂ်-တ** [ṇg^wɔ:lɪnɛ ṇɪnda]
 2-C-run_for:COMP what-QW
 why did you run?

နက **န-၁-ဝ** [nɔ nɔw]
 waterplaces C-of-people
 the waterplaces of the people

a-kw-ákkakat **nɔ-ppǎn** [au^wákāuā nɔpān]
 CONJ-3-come:DEPPRFV on-room

and s/he came into the room (the speaker is in the room)

m-p-ímmát-ɔk **nɔ-cɔɔɔŋ** [mbim:ádɔ̃ nɔjɔɔŋ]
 1-C-see_at:COMPL-O3 on-mountain

I saw him/her on the mountain

tuɔɔt **t-á.rəttakɔt** **nán** [tár^ətauɔ nán]
 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 **ɲ** could actually also be regarded as elision of **t** or **k** before **m**, **n** or **ɲ**. 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-ún-néɔ́ ‘both rats (sp.)’

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

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

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

Examples follow here with **t** realized as [r] before **ń-** ‘with, by, (away) from’. In the first to third examples **t** is (part of) a verbal

inflection marker, in the last example **k** is the final consonant of an object pronominal clitic.

a-kw-ákkakat n-óɽupa [aʷákaʷar nótɽɒa]

CONJ-3-come:DEPPRFV with-spirits

and s/he came with the spirits

a-kw-ákkakat n-tacók [aʷákaʷar ndajókʰ]

CONJ-3-come:DEPPRFV with-legs

and s/he came on foot

a-kw-ákkakat n-nɔ-ppăn [aʷákaʷar nɔpān]

CONJ-3-come:DEPPRFV with-on-room

and s/he came out of the room (the speaker is outside the room)

ɔllé p-ɔkɨccé.r-ɔk n-tuăn [ɔl:é βɔʷicérɔʷ n̄dōān]

husband C-chase:COMPL-O3 with-home

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.

ant-ɔkwárikɔt na [andɔʷáɽɨʷɔɽ na]

can:DEPINCOMPL-recall:DEPINCOMPL where:REL

ɨ-kw-ɔnəkkét.é kúrrôɨ

2-C-put_down:COMPL stick

please recall where you have put your stick

m-p-a.nékɔ kəɾet na-kakkâ [kʰɾɛɾ nauʷakâ]

1-C-take:INCOMPL cloth where:REL.PERS-Kakka

I will take the cloth to where Kakka is

Before nɔ- ‘on, at’ when attached to a noun or pronoun with the persona prefix ɔ- or to the question word ɔtta ‘who’:

maɪt m-a.ɪk m-ɛkkót n-a-kukkô [mekór nauʔokô]
 beans C-be:PR C-enough on-PERS-Kukku
 the beans are enough for Kukku

maɪt m-a.ɪk m-ɛkkót n-a-nîɲ [mekór nanîɲ]
 beans C-be:PR C-enough on-PERS-1A
 the beans are enough for us

maɪt m-a.ɪk m-ɛkkót n-á-t̪ta [mekór náʔta]
 beans C-be:PR C-enough on-PERS-who:QW
 for whom are the beans enough?

By contrast, there is assimilation and shortening of the resulting geminate when **t** and **k** precede **nɔ-** ‘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).

pul p-ɛ̃.t [pul ^(ə)βɛ̃t̪]
 person C-go:COMPL
 the person has left

kaʔər k-ápe [kaʔər ^(ə)ʔáβɛ]
 road C-wide
 the road is wide

tər t-ɔ-kəpá [tər ɔʔəβá]
 appetite C-of-meat
 appetite for meat

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:

lɔŋkwat lɛɬt [lɔŋg^wa lɛɬt^ː] ‘the sheep (PL) have gone’
lɪcɔk lɛɬt [lɪcɔ lɛɬt^ː] ‘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:

lakkəɾulákkəɾuk (< **lakkəɾuk-lákkəɾuk**) ‘butterflies’

/t/ is, however, realized as a trill before **l** as allomorph before an **l**-initial noun of **ń-** ‘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-lɪcɔk [aɥ^wákawɾar lɪjɔk^ː]

CONJ-3-come:DEPPRFV 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:

ɪmɪt w-ɪn [ɪmɪr ɪn]

goat C-POSS1

my goat

wɔk w-ɔ-ul [wɔɥ 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-ûkwît** ‘long’ when the concord is **w**:

arí **w-ûkwîr-ûkwît** [wûw^wírwûw^wî^ˈ] (< **wûkwît wûkwît**)
 nails c-long-(c).long
 the nails are long

2.1.2. Remarks on **k^w**

*Variation **k^w** ~ **k** after a high back vowel (**u** or **ʊ**)*

In word-medial position there is neutralization between **k^w** and **k** after **ʊ** 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:

porókô	vs.	porúkwô	‘friend’
orúkwô	vs.	orúkwô	‘hide’
tókia	vs.	túkwia	‘head pad’ (for carrying heavy things)
ókka	vs.	úkkwa	‘become old’ (of people and animals)
otúrukke	vs.	otúrukke	‘swallow’
tunkat	vs.	tunkwat	‘sheep’
tunke	vs.	tunkwe	‘liver’

The same is found in a borrowed word:

cókkar vs. **cókkwar** ‘sugar’ (< Sud. Ar. *sukkar*)

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

apo ‘fall’ **apukkwô** or **apukk(w)ô** ‘fall with several bumps’

An exception is the adjective **-ûkwîṭ** ‘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:

cəkwâ	‘breath’
cəkwónə	‘produce’
akwa	‘okay’
aɪkkwət	‘drive (animals) in different direction’
(also: aɪkkwət or aɪkkət)	‘drive (animals) in different direction’
cəkkwə	‘stir to solve lumps’

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

cəkkwə	‘hit’	cəkkə	‘pass’
cəkkwət	‘kill’ ¹⁶	cəkkət	‘do, make’

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

¹⁶ In the speech of NiA there was lenition also in the words **cəkkwə** ‘hit’ and **cəkkwət** ‘kill’. They were pronounced as [cʷβə] and [cʷβət] respectively, with very weakly articulated ʷβ, whereas they were pronounced as [cʷkə] and [cʷkət] by NaA and JS. No information is available about the pronunciation by NiA of other words with **kkʷ** between vowels.

k^w before a high back vowel (u or ʊ)

For some speakers there is a phonological restriction against a labialized velar consonant preceding ʊ or u, but not for all. JS and NiA did not produce sequences k^w-ʊ or k^w-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 ʊ or u-initial verbs preceded by the 2nd person singular pronoun clitic + concord (ŋ-kw-), the third person pronoun clitic (kw-), and the third person pronoun clitic + concord (kkw-):

ŋ-kw-úmmə	vs. ŋ-k-úmmə	‘you will take’
a-kw-úrəkə	vs. a-k-úrəkə	‘and/while s/he gets up’
k-kw-úrəkə	vs. k-k-úrəkə	‘s/he will get up’

Variation was also found in a few lexical items:

əkúrət	vs. əkwúrət	‘move up’
akúccɨ	vs. akwúccɨ	‘money’ (< Sud. Ar. <i>al-guruush</i>)
kucúl	vs. kwucúl	‘back’

Origins of k^w

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

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

k^w incidentally arises from phenomena across morpheme boundaries. The 2nd person singular pronoun clitic ŋ + concord p combine to

ŋkw (see chapter 6.2.1). A labialized velar can also arise from prefixation of the prepositional clitics **ɾ**-, **nɔ**-, **tɔ**- or **ʔɔ**- to a noun with initial **k** and a labial consonant as onset of its second syllable, for example: **ɪkkwɔ̃n** ‘in the field’ (< **ɪ** + **kəpɔ̃n**), and **ŋkwɛ̃l** ‘in the hunting party’ (< **ɪ** + **kəmə̃l**) (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. **tʷ** is attested as a variant of **tɔ** in just two items, at least one of which is probably not originally Lumun.

ittuǎŋ ~ **ittwǎŋ** very (also **ittiǎŋ**)
attoak ~ **attwak** all, whole (probably a loan from Tocho)

2.1.3. The phonemes **m**, **n**, **ɲ** and **ŋ**

The distribution of **m**, **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 8 Distribution of nasal phonemes in words

	m	n	ɲ	ŋ
word-initial	+	+	+	+
word-final	(+)	+	–	+
before an obstruent phoneme	+	+	+	+
between vowels	+	+	+	+

Word-initial position

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

məpôk	‘arrows’
nəɽi	‘cobras’
ɲəpǎɾ	‘partridges’
ɲɔɾɛ	‘laziness’

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

ɔkukkú-ɲn	(< ɔkukkô + -ɲn)	‘Kukku and his companions’
akka-ɲn / aka-ɲn	(< akkă + ɲn)	‘why?’
a-úra ...	(< á- + ɲura)	‘and the bull ...’
lɪpɪl ló-ura	(< lɔ- + ɲura)	‘the horns of the bull’
ɲura ɲɛɛt	[ɲura ɛɛtʰ]	‘the bull has gone’

Initial **ɲ** 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 **ɲ** (though rarely attested, see 2.1.3), the resulting nasal is written as a singleton:

ɔcɔ-ɲn	[ɔjɔ-ɲn]	‘John and his companions’
(< ɔcɔɲ-ɲn < ɔcɔn + -ɲn)		
ɲɪttɪpɪt ɲn	[ɲɪtɪβɪ ɲn]	‘my billy goat’
mpɪmmát ɲura	[mbɪm:á ɲura]	‘I saw the bull’

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

noɽupa nɛɛt	[noɽupa nɛɛtʰ]	‘the lizards (sp.) have gone’
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Word-final position

Word-final nasals are restricted to **n** and **ɲ**:

kaɾan	‘place’
kanáj	‘wind’

Final **m** just occurs in a few loans, for example:

kálam ‘pen’ (< Sud. Ar. *galam*)

Unlike initial **ŋ**, final **ŋ** is not deleted between vowels:

ɔkumáŋ-i [ɔuɔumáŋ-i] (< **ɔkumâŋ** + **-i**) ‘(is/was it) Kumaŋ?’
ɔkumáŋ émpí [ɔuɔumáŋ émbí] ‘this Kumaŋ’

A nasal before an obstruent phoneme

All nasals can precede a phoneme **p**, **t̪**, **t**, **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:

cin̩t̪aŋ [cin̩ɖaŋ] ‘bird (sp.)’
m-pól [mból] ‘with the person’ (< **ń-** + **pól**)
parantaŋ pîn [parandam bîn] ‘my gourd’

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

pɪɾɪmam-pɪɾɪman [pɪɾɪmambɪɾɪman] ‘spider’
ciɾɪŋ-ciɾɪn [ciɾɪŋɾɪn] ‘seed (sp.)’
kəɾɪŋ-kəɾɪn [kəɾɪŋgəɾɪn] ‘musical instrument (k.o.)’
takkun-tákkun [takundákkun] ‘mosquito’

Between vowels

Between vowels, all nasals are attested:

ɪama [ɪama] ‘be(come) hungry’
ana [ana] ‘and’
aɲɔ [aɲɔ] ‘open’
ɔŋɔt [ɔŋɔt] ‘like, want, love’

A labialized velar nasal

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

ṁṁɔt [ṁṁɔt̚] ‘like, want, love’

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

One word may seem to have [ŋ^w] as initial sound: the singular of **ṁṁí** /**ṁṁí** ‘milk’ ([ṁṁí], [ṁ^uí], [ṁ^wí]). However, between vowels **u** remains, so that a sequence **ŋ-u** is the better analysis:

í-uí ‘in the milk’ (< **í** + **ṁṁí**)

Moreover, **ṁṁí** 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 **ŋ**, not **ŋ^w**.

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 **ɲ** and **ŋ** (not **ŋ^w**) 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

¹⁷ I use **ŋw** 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

ɔmmê	‘move asida’ (bring to mouth or pour on a plate)
ɔmê	‘tattoo’ (verb)
imma	‘see’
i-má	‘in heads’
ime	‘wash’
c-ímmjɪn	‘heavy’
ɪmɪt	‘goat’
ɔmmo	‘take, pick (up)’ (one item)
ɔcúmɔ	‘take, pick (up) one by one’ (scattered items)

Short versus long n

ɔnne	‘help put a load on the head several times’
ɔnê	‘help put a load on the head’
ɔnné	‘your mother’
ɔnâ	‘bring’
ɔnna	‘habitually bring’
ɔnnân	‘(his/her) mother’
kunnûr	‘fruit of <i>punnur</i> -tree’
kunú	‘ear’
cannán	‘very’
kanáj	‘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 wordlists¹⁹, 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’.

cɲâ	‘shoulder blade’
-ɲâ	‘secrete itching fluid (poison)’
mɲâ	‘shoulder blades’
mɲâ	‘speed’
kɲɪ	‘wound’
pɲɪl	‘snake’
? pɲɲît	‘singer’
kɲɪt	‘rib’

In the adverb **ɲɲəɲɲ** ‘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 **ɲɲɪ** ‘this, these’ (near speaker), **ɲɲəɲɪk** ‘this, that, these, those’ (near addressee) and **ɲɲəɲê** ‘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 (**ɲɲɪ** is an assimilation product with format **ɛn-C-í**, where the concord (C) is ɲ; **ɲɲəɲɪk** has the format **ɛn-C-əɲɪk**, and **ɲɲəɲê** the format **ɛn-C-əɲê** (see chapter 8.1)). Some nasal length can also be realized in **ɲɲ-ɲ-ɲɲ-ɲɲɪ** ‘both’ modifying a noun of the ɲ-class, and other modifiers based on the format **at-C-ɔt-C-numeral** (**át-C-út-C-numeral**) (see 10.4.2).

¹⁹ Kuku et al. (2006) and Lumun wordlist 25 February 2004.

Short versus long ɲ

There seems to be no root-internal length contrast of ɲ between vowels. In **añəna** ‘very’ the velar nasal has (or can have) length, but, like in **añəɲə** ‘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 **əpəɲɔn** ‘siblings’ (< **əpən** + **-ɲɔn**), 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 **əɲ-ɲ-í** ‘this, these’ (near speaker), **əɲ-ɲ-ərík** ‘this, that, these, those’ (near addressee) and **əɲ-ɲ-ərê** ‘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 ɲ 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 **ń-** ‘with, by, (away) from’. In these cases length tends to be realized, especially in isolated words.

m-máɲtak	‘with bowls’
n-naɲám	‘with books’
ɲ-ɲaɲɔkkɔl	‘with calabashes (k.o.)’
ɲ-ɲaɲɔkkɔl	‘with a calabash (k.o.)’

Some speakers realize a short vowel **ɪ** before the clitic instead:

m-máɲtak	[m:áɲakʰ], [ˈmáɲakʰ]	‘with bowls’
ɲ-ɲɪn	[ɲ:ɪn], [ˈɲɪn]	‘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-ḡṛəkó.t [nḡṛ^hʷót^h]

PRO.C-eat:COMPL

they (the rats, sp.) have eaten it

ʊkʊl w-ḡnekó.t ḡṛɪ ána ḡ-ḡ-ímmɪn

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, **ḡ** is typically elided after **l** or **r** across a word boundary. The other nasals can be elided in this position as well.

mʊpól mɪn	[mʊβól mɪn], [mʊβól ɪn]	‘my hats’
naɾaŋkal nɪn	[naɾaŋgal nɪn], [naɾaŋgal ɪn]	‘my beds’
ɲʊkʊl ɲɪn	[ɲʊʋʊl ɲɪn], [ɲʊʋʊl ɪn]	‘my children’
ḡʊcʊl ḡɪn	[ḡʊcʊl ɪn]	‘my sauce’
mɔɾér mɪn	[mɔɾér mɪn], [mɔɾér ɪn]	‘my young female goats/cows’
nɔr naɪk	[nɔr naɪk ^h], [nɔr aɪk ^h]	‘there is appetite’
ḡar ḡaɪk	[ḡar aɪk ^h]	‘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 **-mé** (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

ĩĩk.ĩ **kĩ-nâ** (**< kĩt -na**)
 tie:IMP wild chicken-ALLOW

ɪ̞ɾɪk.ɪ ʔakəɾɔ-ŋâ (< ʔakəɾók -na)
 tie:IMP chicken-ALLOW

ana ɔ-rit t̪-a.rékɔ ɣǝré ɣ-ótté-i-ɣé (< ɣóttéik -mé)
and PERS-12 C-work:INCOMPL work C-little-VREF-PROP

Nasal before l

1-lôn ‘with words’ (< **ń-** + **lôn**)

lɒn	l-aŋ	l-ɔpərɔt	[lɔ la lɔβ ^ə rɔtʰ]
words	C-POSS2	C-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

	l
word-initial	+
word-final	+
between vowels	+

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

lɔn ‘words, matters, mouths’

ɬɔn ‘mouth’

cɪl ‘grain of sorghum’

cɪt ‘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**:

cələk ‘neck’

cakkəlɔk ‘calabash (k.o.)’

kəlɔk ‘first stage of what becomes a fruit’

kulɔra ‘shelter for goat’

kwalɪlɪn ‘centipede’

ɔcɔla ‘become tasteless’

aləkɔt ‘surpass, defeat’

apɛɾɪlakɔ ‘hang (intr., from the hands)’

Some words with geminated **l**:

pəlla ‘cat’

calle ‘ball’

kəllân ‘old woman’

kɪllôk	‘skin of sugarcane’
təllapôk	‘frog’
cəllakkér	‘roof skeleton’
cəɾellé	‘hip’
cəɾəllăn	‘calf (part of leg)’
cərəllópa	‘sorghum stem’
ella	‘be absent’
əllô	‘run’

Word-initially there is geminated **l**, resulting from attachment of the prepositional proclitic **ń-** ‘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 **ń-** ‘with, by, (away) from’ can be pronounced with some length. It contrasts with short **l** in word initial position:

l-lɪcók	‘with the goats’
lɪcók	‘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 **lən** ‘words, matters’:

l-ɔpərôt (< **l-l-ɔpərôt**) [lɔβːrôt] ‘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 **lən** ‘words, matters’) and concord:

lɪpɪl lɪn [lɪpɪ lɪn] ‘my horns (musical instrument)’

A case in which length may (but needs not) be pronounced is demonstrative **əllí** ‘these’, in which the second **l** is the concord, while the first **l** is underlyingly **n** (the frame is **en-C-í**).

In two lexemes, **l** becomes **ɽ**, or can become **ɽ**, in intervocalic position across a morpheme boundary:

lɛccɪt ‘threshing floor’
ɪ-ɽɛccɪt ‘on the threshing floor’
tɔ-ɽɛccɪt ‘on the edge of the threshing floor’

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

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

ɽɛ́kket ~ ɔ́kket ~ nɛ́kket ‘put down’

In the verb ‘close’ **l** varies with **n**:

ɔlukkwa ~ ɔnukkwa ‘close’

l 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, **l** does not change, rather a very short schwa may be inserted:

lar l-ɪn [lar ^(ə)lɪn] ‘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

	/r/	/ɽ/	/t/
word-initial	–	–	[t]
word-final	[r] ~ [r:]	–	[tʰ]
between vowels	[ɾ], [r]	[ɽ]	[ɾ]

Table 11 Rhotics: realization across a morpheme or word boundary

	r	ɾ	t
before certain nasal morphemes	[r]	–	[r]

Geminated rhotics

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

There is no geminated retroflex flap. **ɾ** 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):

arɔ cɪk	‘sleep, spend night’	alle cɪk	‘habitually sleep, habitually spend night’
urɛ	‘graze (animals)’	urɛlle	‘habitually graze (animals)’
irɛ	‘say’	irille	‘habitually say’
ɔkəɾɔ	‘bite’	ɔkəɾelle	‘habitually bite’
ɔɾɔtta	‘be eaten’	ɔrrɔtta	‘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:

ərét	[ʔrét]	‘cloths’
ərrɔ	[ʔr:ɔ]	‘push’
ərɔ	[ʔɾa]	‘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:

rrəppe ‘illness caused by somebody who has twins’

However, this word appears to be underlyingly **t**-initial, since it takes **t**-concord:

rrəppe **t-ɔ-kəllán** **t-ɔkítak** [rɪəpɛ rɔɥ^əlɪán dɔɥítakʰ]
 illness(k.o.) c-of-old_woman c-bad

the illness of the old woman is bad

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

ərɛt w-ɔ-kakkâ ‘the cloths of Kakka’ [ʔɛɛɛ ɔɥakâ]

Word-final position

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

kaɽər [kaðər], [kaðər:]

Rhotics between vowels

Between vowels all rhotics occur. Some words contrasting **r** and **r:** intervocalically follow here:

kara	‘tick’	karră	‘lie’
kəmarâŋ	‘shield’	karrəŋ	‘wall’
cɔrɔcɔrɔ	‘fruit (k.o.)’	arrô	‘Lumun people’
cɪrɪ	‘wrist’	cɪrrít	‘tick (sp.)’
ɔrâ	‘cultivate’	ɔrra	‘habitually cultivate’
kurê	‘left side’	kurrét	‘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

NaA		JS	
[ɾ]	carók ‘belly, stomach’	[ɾ]	carók ‘belly, stomach’
	ɲura ‘bull’		ɲura ‘bull’
	pɪra ‘tree’		pɪra ‘tree’

[r]	ɲorak ‘monkey (sp.)’	[r]	ɲorak ‘monkey (sp.)’
	kɪrék ‘hoe’		kɪrék ‘hoe’
	pɛrǔ ‘tree (sp.)’		pɛrǔ ‘tree (sp.)’

In the writing in this book, I do not represent the intervocalic rhotic contrast [r] - [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** ([r]). For JS the **r**’s in **ɔrâ** ‘cultivate’ and in **ɔkéɾɔ** ‘trade’ are not different. Whether or not they are different for NaA I do not know.

ɔrâ ‘cultivate’ **ɔrrɛ** ‘habitually cultivate’
ɔkéɾɔ ‘trade’ **ɔkéttɛ** ‘trade (several objects)’

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):

kurəʈut [kurəʈutʰ] ‘bed plank (k.o.)’
ɔkkápəɾəttakɔ [ɔkáβɾtaʋɔ], [ɔkaβʳɾtaʋɔ] ‘return’
pəré [pɾé], [pʳɾé] ‘monitor lizard’

In these cases it seems that the moraicity of schwa can (partly) be transferred to **r**. This does not happen in **carák** ‘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:

kaɽər **k-ápe** [kað̣ʳ-əʷáβɛ]
 road c-wide
 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 JS²⁰:

kaɽər-î [kað̣ər-î] ‘the road?’

Flap

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

C-əɽɛk ‘some’
cələk ‘neck’
kəɽát ‘door’
kəréɽ ‘cloth’

ɽ is sometimes interchangeable with **r**:

ɽɽé ~ **ɽɽé** ‘young girls’ (but in SG only **ɽɽé** ‘young girl’)
ɽɽáɽə ~ **ɽɽáɽə** ‘peel’

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.

2.1.6. The phoneme **w**

The distribution of **w** is presented in the table below. **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), **w** is typically elided between vowels at a word-internal morpheme boundary, just like **w** as a common noun subject pronominal clitic (chapter 6.3). As a noun class prefix, however, some speakers (among whom JS) retain **w** between vowels at a word-internal morpheme boundary, while others delete it.

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

Table 13 Distribution of **w** and occurrence after a vowel-final prefix or clitic

	<i>word-initial</i>	<i>word-internally between vowels</i>	<i>word-final</i>
w	+	–: not in roots, except in some loans + /–: as noun class prefix after a vowel at a morpheme boundary: not elided by some speakers, for others elision is possible –/(+): as a common noun subject pronominal clitic after a vowel at a morpheme boundary: commonly elided –/(+): as a concord after a vowel at a morpheme boundary: commonly elided	–

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 **wék** 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 **u** (or **u**) as found in verbal stems or nominal roots. **w** as a concord (or a pronominal clitic) is pronounced as a consonantal glide.

uɛt	[uɛtʰ]	‘make accept’	
wét	[wétʰ] ~ [ʷétʰ]	‘bamboo circles of roof’	
wék	[wékʰ] ~ [ʷékʰ]	‘leg’	
uɛ	[uɛ]	‘undress’	
wê	[wê] ~ [ʷê]	‘calabash(es) or pot(s) for fermenting flour and water’	
pé	[pé]	‘gum tree’	
uá	[uá]	‘fruits of <i>pua</i> -tree’	
waɿ	[wāɿ] ~ [ʷāɿ]	‘cow’	
wanôk	[wanôkʰ] ~ [ʷanôkʰ]	‘moons’	(also anôk)
w-aîk	[waîkʰ]	‘C-is/are’	
p-aîk	[paîkʰ]	‘C-is/are’	
uɔ	[uɔ]	‘descend’	
w-ɔ	[wɔ]	‘C-of’	
wɔk	[wɔkʰ] ~ [ʷɔkʰ]	‘shoes’	
pók	[pókʰ]	‘foam’	

Root-internal intervocalic w

Root-internal **w** is only attested in a few loans from Arabic:

aláwa	‘sweets’	(< Sud. Ar. <i>halaawa</i>)
alawîr	‘bush (sp.)’	(< Sud. Ar. <i>al-ʕawiir</i> ‘the stupid’)
aṭṭáwa	‘medicine’	(< Sud. Ar. <i>ad-dawa</i>)

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-waɪ̯ / ɪ-waɪ̯	‘in the cow’
ɪ-wét	‘between the bamboo circles of the roof’
cɪrɪ cɔ-wék	‘the ankle (lit.: the joint of the leg)’

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

ɪ-aɪ̯ / ɪ-aɪ̯	‘in the cow’
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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-allîr / ɪ-allîr	‘in the gazelle’
ɪ-wallîr / ɪ-wallîr	‘in the gazelle’

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

n-naɪ̯ / n-náɪ̯	‘with the cow’
n-nék	‘with the leg’

The pronoun clitic **w-** is commonly elided word-internally between vowels, unless in careful speech:

aʊn w-ɔká.t cɪk áɾəkɔ kəpá (< **a-w-ɔ́ɾəkɔ**)
 rats C-be:COMPL VREF CONJ.(PRO-)eat:DEPINCOMPL meat
 the rats were eating meat

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

aʊn ɪ-ɛɔ̃.t (< **ɪ-w-ɛɔ̃t**)
 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):

mpakóɬa wai ‘I will look at/after the cow’
mpɪmmát wék ‘I saw the leg’ [mbɪm:á wékʰ]

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

mpɪmmát wék ‘I saw the leg’ [mbɪm:ár ékʰ]

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**:

wai w-aát	[wai aátʰ]	‘the cow has come’
wan w-ɔkakkâ	[wan ɔɰakâ]	‘the hair of Kakka’
ʊnɔ̃ŋ w-ɛɾá	[ʊnɔ̃ŋ ɛɾá]	‘two walls’
ʊl w-ɛɾá	[ʊl ɛɾá]	‘two persons’
aɾər w-ɛɾá	[aɾər ɛɾá]	‘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 [w]. After [r] **w** is elided, whereas after [u] it can be elided but not necessarily so:

it	w-a.ɪk	w-ímma	[ɪr aɪw wím:a], [ɪr aɪw ím:a]
wild_chickens	C-be:PR	C-see:INCOMPL	

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.

ukul	w-ɔŋɔ́.é	itɪ	w-úkkwə	[ʊkʊl ɔŋɔ́ðe itɪ wókʷə]
child	C-like:COMPL	that	PRO.C-dance:INCOMPL	

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 **ń-** ‘with, by, (away) from’, but a noun with initial **w** does. As shown above, **w** assimilates to proclitic **ń-** ‘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 [ɰ] and with [j]. The latter realization is spelled as <ɪ>. In this case, [j] is a further lenition of the intervocalic allophone of **c** ([ɰ]).

ɰcáca	[ɰjája]	‘my mother’
ɰíáia	[ɰjája]	‘my mother’

[j] is in some cases the realization of a vowel. In a sequence of three vowels **aeɰ**, **ɛ** is realized as [j], though in careful speech it can be realized as **ɛ**. The verb in the first example below is related to the noun **ŋae** ‘urine’. The second example is the (irregular) Incomplete TAM of the verb **ɛŋ** ‘go’.

ɰŋáɛŋ	[ɰŋájɰ]	‘urinate’
m-p-aeŋ	[mbajɰ]	‘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’:

kəɾet	k-íccí	[kící], [kísí]
cloth	c-green	
the cloth is green		

Sibilants are also found in some words used for chasing away or calling animals. An example is **síla**, 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 [ɿ] (**ʃɛn**, for calling a pig), and a word with [h] (**hao**) for chasing away a dog. [θ] occurs in a sound symbolic word expressing the sudden appearance of something, **attôθ**.

2.1.9. Consonant clusters

As mentioned earlier, Lumun has nasal-stop clusters:

mp [mb], **nt** [nd], **nt** [nd], **ɲc** [ɲj], **ŋk** [ŋg] and **ŋkw** [ŋgʷ]

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

kɪpɛ ‘nose’

In word-initial position they result from attachment of one of the nasal proclitics **ń**- ‘with, by, (away) from’, **ń**- ‘I’, **ŋ**- ‘you (SG)’, **ń**- ‘you (PL)’ or **ń**- ‘they’ to a word with an initial obstruent phoneme. These nasals can be moraic. Some speakers tend to pronounce a short **ɪ** [ɪ] 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.

m-p-immâ.t [ᵐbɪm:âːt̚], [mbɪm:âːt̚], [ˈmbɪm:âːt̚]

1-C-see:COMPL

I saw (it)

m-pôl [mbôl], [ˈmbôl]

with-person

with the person

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 ə can be transferred to this rhotic, lateral or nasal.

obstruent and lateral:

pəlla	[pʰl:a], [p :a]	‘cat’
kəllân	[kʰl:ân], [k :ân]	‘old woman’

obstruent and rhotic:

pəɽɪn	[pʰɽɪn], [pɽɪn]	‘finally’
kəɽét	[kʰɽétʰ], [kɽétʰ]	‘cloth’

obstruent and nasal:

pənân	[pʰnân]	‘woman without children’
kəmɛl	[kʰmɛl]	‘hunting party’

nasal and rhotic:

ɲəɽĩ	[ɲʰɽĩ], [ɲɽĩ]	‘water’
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nasal and lateral:

mələmɛla	[mʰləmʰla]	‘a little’
ɲəlləkôr	[ɲʰl:əkôr], [ɲ :əkôr]	‘sorghum (k.o.)’

Tone movements also show that these consonants do not form consonant clusters, but are separated by ə. Upon prefixation of **ń-** ‘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 **nɔ-** ‘on, at’ or **ɪ-** ‘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.

pəɾɛ	[pʰɾɛ], [pɾɛ]	‘monitor lizard’
mpʰɛɾɛ	[mpʰɾɛ]	‘with the monitor lizard’
nɔpʰɛɾɛ	[nɔβʰɾɛ], [nɔβɾɛ]	‘on the monitor lizard’

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:

ɔlʰkkɛt	[ɔlʰketʰ]	‘put down’
aləppéra	[alʰpéra], [alpéra]	‘flag’ (< Sud. Ar. <i>al-beerag</i>)

rhotic and voiceless stop:

ɔrrɔtta	[ɔrːʰta], [ɔɾːta]	‘be eaten (plural subject)’
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lateral and voiced fricative or approximant:

aləpaccôṭ	[alʰβacôṭʰ], [alβacôṭʰ]	‘jackal’ (< Sud. Ar. <i>al-baʿshoob</i>)
aləkaɾɛ	[alʰɥaɾɛ], [alɥaɾɛ]	‘old coin of ten piasters’

rhotic and voiced fricative or approximant:

ɔɾəkɔ	[ɔɾʰɥɔ]	‘eat’
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lateral and nasal:

aləmóntu	[alʰmóndu], [almóndu]	‘gun’ < Sud. Ar. <i>al-bundugiyya</i>
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rhotic and nasal:

mərəmər	[mərʰmər], [mərmər]	‘eight’
cərəntuk	[cərʰndukʰ], [cərɳdukʰ]	‘small bell’

rhotic and lateral:

corəllópa [cor^hl:óβa], [corl:óβa] ‘sorghum stem’

2.2. Vowels

Lumun has eight vowel phonemes: **ɨ**, **ɪ**, **u**, **ʊ**, **ɛ**, **ɔ**, **a**, **ə**.²¹

2.2.1. Contrastive series

Minimal pairs and near minimal pairs provide evidence for the contrastive status of **ɨ**, **ɪ**, **ɛ**, **a**, **ɔ**, **ʊ** and **u**.

ɨ versus **ɪ**

kɨt	[kɨt ^h]	‘eyes’
kɪt	[kɪt ^h]	‘wild chicken’
ɨɪkɔ	[ɨɪuɔ]	‘tie’
ɪɪkɔ	[ɪɪuɔ]	‘enter’
ɔkɨɔ	[oɔɪɔ]	‘drive together (of cattle)’
ɔkɪɔ	[ɔuɪɔ]	‘cut’

u versus **ʊ**

kua	[kua]	‘strand of hair’
kuâ	[kuâ]	‘digging tool’
ɲuɾû	[ɲuɾû]	‘asida’
ɲuɾʊ	[ɲuɾʊ]	‘dirt’
uno	[uno]	‘pour’
ʊno	[ʊno]	‘build’

²¹ Kutsch Lojenga also analysed eight vowel phonemes (unpublished notes of 2004).

ε versus ɪ, ʝ and ɔ

cêṇ	[cêṇ]	‘palm fruit’
cîn	[cîn]	‘egg’
cîṇ	[cîṇ]	‘thigh’
εḏ̣	[εḏ̣]	‘go’
ɪɔ	[ɪɔ]	‘die’
ʝɔ	[ʝɔ]	‘set fire to’
ceɾêṇ	[ceɾêṇ]	‘middle of body’
cɔɾḏṇ	[cɔɾḏṇ]	‘mountain, hill’

ɔ versus ʊ

kəpɔṇ	[kəpɔṇ]	‘farming field’
k-ɔpún	[kɔpún]	‘bitter’
ɔrâ	[ɔrâ]	‘cultivate’
ʊra	[ʊra]	‘escape’

a versus ε and ɔ

măṇ	[māṇ]	‘house’
mên	[mên]	‘palm fruits’
ʊra	[ʊra]	‘escape’
ʊre	[ʊre]	‘forget’
ṭār	[ṭār]	‘net for storage’
tɔr	[tɔr]	‘appetite’
ɔllâ	[ɔl:â]	‘wipe away’
ɔllô	[ɔl:ô]	‘run’

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.

ərɾɔ	[ʔɾɔ]	‘shoot’
ɪrrɔ	[ɪɾɔ]	‘jump’
ɲəɾĩ	[ɲʔɾĩ]	‘water’
ɲilĩ	[ɲilĩ]	‘leadership’
cəmmɔ́ɔ́n	[cʔm:ɔ́ɔ́n]	‘caterpillar (sp.)’
cummûn	[cum:ûn]	‘owl’
cəpú	[cʔβú]	‘hole in the ground’
cupû	[cuβû]	‘fruit of pupû-tree’
capú	[caβú]	‘ground’
əpa	[ʔβa]	large bowl for preparing beer
paa	[pa:]	grapevine
pəré	[pʔré]	‘monitor lizard’
peré	[peré]	‘chest’
əɬén	[əðén]	‘wild felines (sp.)’
ɔɬén	[ɔðén]	‘baskets (k.o.)’
kəɾan	[kʔɾan]	‘name’
kaɾan	[kaɾan]	‘place’
ɬəɾák	[ɬʔɾák]	‘rope’
ɬəɾák	[ɬʔɾák]	‘war’

2.2.2. ATR (Advanced tongue root)

In minimal pairs the difference between **ɔ** and **u** and particularly between **ɪ** 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 **ɪ** and **ɔ**. 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 **ɪ**, **ɔ**, [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, **ɪ**, **ɔ**, **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. **ə** 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 laxer 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:

kucúl ‘back’, **mucúk** ‘ashes’, **cərúk** ‘opening’, **kunú** ‘ear’, **kunû** ‘scorpion’, C-**ullúk** ‘only, just’, C-**ərúk** ‘only, just’, **cuccû** ‘bead’, **waĭ** ‘cow’ and C-**ɔŋĭ** ‘black’.

2.2.3. Phonetic realizations of ə

The vowel ə (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 ə

ə 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 ə 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:

kappəɾi	[kap'ɾi], [kapɾi],	‘spoon’	L.L.H
kapəɾal	[kaβ ^ə ɾal]	‘apron’	L.L.L

In initial position it is short but clearly audible:

ərit	[ɾit ^ʔ]	‘granaries’
əɾan	[ɾan]	‘names’

In a closed final syllable, ə often sounds like a full vowel, particularly when the final consonant is an obstruent:

carək [carəkʰ] ‘belly, stomach’
cakət [caʊətʰ] ‘toe’ (also: **cakát** [caʊátʰ])

quality of ə

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

təpək [təβəkʰ] ‘forked stick’
əttəŋ [ʔtəŋ] ‘again’
təmmək [tʰm:əkʰ] ‘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 ɔ:

cakət [caʊətʰ] ‘toe’
carək [carəkʰ] ‘belly, stomach’
kaɾən [kaɾən] ‘place’
kaɾər [kaðər] ‘road’
cɔɾər [cɔɾər] ‘young goat’

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

kuɾəɽɪ [kuɾʊɽɪ] ‘leaf of *pupu*-tree’
kuɾəɽa [kuɾʊɽa] ‘bamboo needle’
ʊɾəlle [ʊɾʊl:ɛ] ‘habitually graze (animals)’

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

p-ərɪk [pʰɪkʰ] ‘big, important’
ɲarəkkuɔk [ɲarʊkʰ] ‘baby’

In case of a following mid-vowel (ɛ, ɔ), ə can take on the quality of this vowel, but also be realized as a central vowel:

ərɔ	[ʔr:ɔ], [ʔr:ɔ]	‘shoot’
ərét	[ʔrétʔ], [ʔrétʔ]	‘cloths’

With **a** in the stem-internal following syllable, **ə** is realized as a central vowel:

əlla	[ʔl:a]	‘cats’
-------------	--------	--------

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

cəmməɔn	[c ⁰ m:ɔn]	‘caterpillar (sp.)’
ɔpəllɛ	[ɔp ^ɛ l:ɛ], [ɔp ^ɛ l:ɛ]	‘frighten’
ɔkəɽɔt	[ɔk ^ɔ ɽɔtʔ], [ɔk ^ɔ ɽɔtʔ]	‘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 **-arɔ** and the Benefactive suffix **(ɪ)nɛ**. The initial vowel of the Benefactive suffix, realized as **ɪ** when attached to a verb with final or last vowel **ɔ**, is now reduced to **ə**:

ɔkkɔt ‘do, make’ + **arɔ** + **nɛ** > **ɔkkárənɽɛt** ‘do for e.o., make for e.o.’

A case which suggests reduction is the verb **ɔkəɽa** ‘look at’ vs. its Imperative **kaɽa** ‘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 **l** and any following consonant, except when this is another **l**. For example:

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

aləmóntu ‘gun’ (< Sud. Arabic *al-bundugiyya*)

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 **ĩ** and **u** can co-occur, and **ɪ** and **ʊ** (irrespective of which vowel comes first), but not **ĩ** and **ɪ**, **ĩ** and **ʊ**, **u** and **ʊ**, or **u** and **ɪ** (irrespective of which vowel comes first). The vowels **a** and **ə** can co-occur with all other vowels (**ĩ**, **ɪ**, **u**, **ʊ**, **ɛ** and **ɔ**), but in the case of **ə** this is not vice versa: the high vowels and **ɛ** do not precede **ə** root-internally. [e] and [o] do not occur in roots unless **ĩ** 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

	ĩ	ɪ	u	ʊ	ɔ	ɛ	a	ə
ĩ	+	-	(-)	-	+	+	+	-
ɪ	-	+	-	+	+	+	+	-
u	+	-	+	-	+	+	+	-
ʊ	-	+	-	+	+	+	+	-
ɔ	+	+	(-)	+	+	+	+	+
ɛ	(-)	+	+	+	+	+	+	-
a	+	+	+	+	+	+	+	+
ə	+	+	+	+	+	+	+	+

2.2.6. Harmony effects across morpheme boundaries

ɛ, 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:

ɔrékɔ	[ɔréɥɔ]	‘work’
ɪɪkɔ	[ɪɪɥɔ]	‘enter’
ɪɪkɔ	[iɪɥɔ]	‘tie’
ɪɛ	[ɪɛ]	‘say’
ɪɛ	[iɛ]	‘thresh’

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

ɪɪk-ɪɛ	[ɪɪɥɪɛ]	‘make enter’
ɪɪk-ɪɛ	[iɪɥɪɛ]	‘make tie’
ʊn-ɪɛ	[ʊnɪɛ]	‘make build’
un-ɪɛ	[unɪɛ]	‘make pour’

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

ʊn-akɔ	[ʊnaɥɔ]	‘be built’
ʊn-ak-ɪnɛ	[ʊnaɥɪnɛ]	‘be built for’
un-akɔ	[unaɥɔ]	‘be poured’
un-ak-ɪnɛ	[unaɥɪnɛ]	‘be poured for’

Verbal inflectional suffixes tend to have variable realization. There can be (some) harmonization to +ATR root vowels, but not necessarily so. [ɪ], [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 (ɪ-) 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 -tɪ and -mɛ́.

Two clitics have themselves +ATR vowels: the 1PL exclusive subject pronominal pro-clitic (ɪn-) and the 1PL exclusive object pronominal enclitic (-ɪn). 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 ɪ 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.

ɔkkwɔ́	[ɔkwɔ́]	‘hit’
ɔkkwɔ̌	[okwɔ̌]	‘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 (ɪ vs. ɨ and ʊ vs. ʉ), 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:

ŋaák/ɲaák	‘oil’
ɬaák/laák	‘sesame paste’
ŋɛɛ/ɲɛɛ	‘poison’
tuôn/nuôn	‘shovel (k.o.)’
paa/kaa	‘grape (plant sp.)’
caa/maa	‘fruit of <i>paa</i> ’

There is one case in a longer noun:

ɬuulí/luulí	‘hyena’
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One adjective (possibly) has a long vowel:

c-ɛɛná	‘such, like this/that’
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In the case of **ɨɨ** ‘yes’ (answer to a polar question), length can be explained from avoidance of words that consist of just a single vowel.²²

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:

ɔɔ ‘descend’ **ɔɔɔ** ‘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** [ɪ:nɛ] ‘die for’

Long **a** is further attested in some inflected forms of the verb **ɔɔ** ‘come’. The Completive of **ɔɔ** 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 **á**, which is attached between the concord and the —always vowel-initial— verb stem:

ɔl **w-á-aná.t** **ŋəpak**
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-ɪkê (< **ɪ** + **ŋɪkê**)

in-flood

in the flood

pul **ɪ-p-ɔparí-ɪ** (< **ɪpɔparí** + **-ɪ**)

person

RES-C-female-Q

(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 (**aɪ**, **ɔɪ**, **ɛɪ**, **aɛ**, **ɛɔ**, **aɔ**), to 10 (**aɪ**) and 16 (**ɪa**). The separate vowel qualities are largely retained.

Table 15 Diphthongs in nominal roots

	ɪ	ɪ	u	ɔ	ɛ/[e]	ɔ/[o]	ə	a
ɪ		–	–	–	ɪɛ	–	–	–
ɪ	–		–	–	ɪɛ	ɪɔ	–	ɪa

u	–	–	–	–	–	–	–	ua
o	–	oi	–	–	ue	–	–	oa
ɛ/[e]	–	ei	–	–	–	eo	–	–
ɔ/[o]	–	–	–	ou	–	–	–	–
ə	–	–	–	–	–	–	–	–
a	ai	ai	–	au	ae	ao	–	–

Examples:

ijɛ	kijé ‘cows’	iɛ	tukonkíɛŋ ‘bee (sp., small)’
io	miǒ ‘spell’	ia	comian ‘bone’
ua	tua ‘hair (of animal)’	oi	ŋoi ‘milk’
ue	tué ‘river’	oa	cuân ‘rat (sp.)’
ei	ɔpɛi ‘child (of X)’	eo	ʔɛɔŋ ‘beard’
ou	təllɔ́n ‘caterpillar (sp.)’	ai	waɿ ‘cow’
ai	kaɪɸ ‘nail, claw, louse’	au	paun ‘rat’
ae	ŋaé ‘urine’	ao	paó ‘tree (sp.)’

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 **ij**) -initial noun typically retains length, as do vowels resulting from attachment of the question markers **-i**, **-a** and **-ɛ** (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-ɛ**, **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**, **ɪ**, **ʊ**) 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-árrô** (< **k-ɔ** + **arrô**)

mother_tongue C-of.Lumun_people

the mother tongue of the Lumun people

The same happens with **nɔ** ‘on, at’ followed by an **a**-initial noun. The resulting vowel **a** tends to be pronounced with some length (see also 16.3.2).

ɔt̪t̪e **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** [kwáŋ^w-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’:

... **akwɔ-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:

m-p-éí **p-á.éí-a**
 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**:

tɔrrô (< **tɔ-** ‘up on, up at’ + **arrô** ‘Lumun people’)

a-ɔ

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

... **a-laló** **ɔmentet** **ól** **ittí ...** (**á** + **ɔlaló**)
 CONJ-Laló tell.PLUR:DEPINCOMPL people that
 ... and Laló 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:

m-p-a.ík **p-a.kétta** **ɔ-kokkú** **ɲ.ɲɲ** [pawét-ɔwɔkú]
 1-C-be:PR C-be_shaved:INCOMPL PERS-Kokku with:ABS

I am being shaved by Kokku

ɲ-kw-ímma **ɔcáɲ** [ɲgʷím:-ɔjáɲ]
 2-C-see:INCOMPL lizards

you will see the lizards

The sequence **aw** is attested in the verb **aw** ‘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 **ɛɛ** ‘stab, blow’, **ɛɔ** ‘go’ and **ɔŋáɛɔ** ‘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 **ɛétta** ‘be stabbed’ and **mpeɛt** ‘I am gone’.

A noun which is nasalized is **miɔ̃** ‘spell’. **á̃** **ã** [ʔá̃ʔã] ‘no’ is also nasalized.

