2. CONSONANTS, VOWELS AND SYLLABLE STRUCTURE

2.1 List of consonants

The consonants as they are spelled in this book are listed below. Their corresponding phonetic symbols are given in square brackets.

<table>
<thead>
<tr>
<th>Labial</th>
<th>Labio-dental</th>
<th>Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>p [p]</td>
<td>t [t]</td>
<td>ch [tʃ]</td>
<td>k [k]</td>
<td></td>
</tr>
<tr>
<td>b [b]</td>
<td>v [v]</td>
<td>d [d]</td>
<td>g [g]</td>
<td></td>
</tr>
<tr>
<td>m [m]</td>
<td>n [n]</td>
<td>ny [ŋ]</td>
<td>ng [ŋ]</td>
<td></td>
</tr>
<tr>
<td>mb [mb]</td>
<td>nd [nd]</td>
<td>nj [ɲ]</td>
<td>ng [ŋ]</td>
<td></td>
</tr>
</tbody>
</table>

Lorenz (1914:47f.) notes that the s (just like the f, r and sh) is not an original Makonde consonant, but that the sound appears in more and more words as a replacement for the h. Nowadays, there are still examples where both sounds are possible, e.g., **kuviiha/kuviiisa** ‘to be angry’ and the Causative extensions -lh/-ls-. In Swahili loans, z and sh become s, e.g., **nsungu** ‘European’ (SW mzungu) and **kufundiisa** ‘to teach’ (SW kufundisha). As the last examples shows, the f does appear in loans, but since there are only one or two other examples, the sound is not included in the chart above.

The consonants b and g are only found in a few words, e.g., **kubáduula** ‘to bite off’ and **kugóngúola** ‘to push once’; g sounds implosive, more so than b and d (which sound slightly implosive).

The v [v] is a voiced labiodental frictionless continuant (or approximant). — The l often sounds a bit d-like, and especially before the vowel i it becomes a tap [ɾ].
glides may appear as default consonants in onsetless syllables (glide insertion, see 2.7). In other syllables of the shape yV and wV, the two glides phonologically have a different status. The glide y has to be regarded as a consonant, while the glide w underlyingly is a rounded vowel. One argument is found in prenasalization. Prenasalization affects only consonants, not vowels. The y may be prenasalized, and results in nj (lu-yéeye/di-njéeye 11/10 lip). (In the Makonde variants of Mozambique, we found several examples of j which are y in the variants of Tanzania, e.g., luchiya – lusijja 11 root, kuyánda – kujáanda 15 be thin, kuyúúma – kujúúma 15 be dry.) Vowels may not be prenasalized, not in the verbal system (the SC and OC for 1SG; no prenasalization before vowel-initial stems) nor in the nominal system (class 10 nouns which are the plural of class 11 nouns with vowel-initial stems; these class 10 nouns are regarded as starting with y, e.g., lw-ááu/di-njááu 11/10 lip). Prenasalization of w results in mbw (lu-wááni/di-mbwááni 11/10 fence), a clear indication that the w itself is not prenasalized, but is regarded as preceded by a labial consonant. (In the Makonde variants of Mozambique, we found several examples of gw which are w in the variants of Tanzania, e.g., liwáángwa – ligwáángwa 5 bone, luwááni – lugwááni 11 fence, uwoówa – ugwóówa 14 mushroom and kuwáála – kugwáála 15 to dress.) Another argument is found in syllable structure. Syllables of the shape CGV occur where the (consonant) y may be followed by the glide z (’be trapped’), but there are no such syllables where the w may be followed by the glide y.

The symbol ny is not only used for the palatal nasal, but also for the phonetically identical palatalized alveolar nasal ny (’n + i), e.g., in the causative stem -vinya ‘make dance’ (cf. -vina ‘dance’). The distinction between the palatal nasal and the palatalized alveolar nasal can only be made when the sound appears as onset of the final syllable of verbal stems. When the palatalized alveolar nasal occurs in that position, the tonal process Retraction of the final H tone to the penultimate syllable (R) has been blocked (see 3.5.2), e.g., kuvíinya ‘to make dance’ (F tone: blocking of R); this process is not blocked when the palatal nasal occurs in that position, e.g., kúpáánya ‘to beat’ (level H tone: no blocking of R). As the symbol ny represents two different underlying sources which can only be distinguished when appearing as onset of the final syllable of verbal stems, there are three other consonants for which the same story is valid: ch, h and w. They are dealt with here below in short (for more details, see 6.3.2).

To begin with the w, the passive extensions are -w- and -iw-/ew- where w has a vocalic origin (’u). A passive extension in the final syllable of verbal stems blocks the tonal process R, e.g., kuliíwa ‘to be eaten’; a non-passive w is not a block in that position, e.g., kumóówa ‘to shave’. There are examples of ch and h with incorporated vowel, probably the causative ’i (the causative extensions are -y-, and -ih-/eh- with the h with incorporated vowel). When these consonants occur as onset of the final syllable of verbal stems, the tonal process R has been blocked, e.g., kuyóócha ‘to roast’ and kutóóha ‘to touch’; consonants without incorporated vowel are not a block in that position, e.g., kukóócha ‘to poke’ and kuyááha ‘to throw.
away’. All instances of s in the final syllable of verbal stems are with incorporated vowel, probably the causative ‘i (a variant of the causative extension -ih/-ch- is -is/-es- with the s with incorporated vowel).

Finally, in the dialect Chimaraba, the second part (b) of the prenasalized consonant mb (not the b on its own) contains a roll: [mbr].

2.2 The syllabic nasal, prenasalized consonants and the voiceless nasal

The syllabic nasal is homorganic. The syllabic nasal does not occur before vowel-initial stems and monosyllabic stems. As will be shown in the sections mentioned below, certain stem-initial consonants change when preceded by a syllabic nasal:

\[
\begin{align*}
v & \rightarrow m \\
l & \rightarrow n \\
h, y & \rightarrow ny \\
hw, w & \rightarrow mw \\
\end{align*}
\]

The following prefixes and concords occur as syllabic nasals in the proper environments (followed by the section numbers where they are described, and by examples):

NPx: cl.1/3, 18 (4.1, 4.2) n-nyáavi/va-háavi sorcerer (cl.1/2)
PPx: cl.18 (5.1) n-níida/ku-liída which (cl.18/17)
SC: cl.18, 2PL (6.2.1) m-míine/va-víine you/they should dance
OC: cl.1, 2PL (6.2.1) m-mwiile/tu-hwiile die for her/us!

Prenasalization of consonants occurs with the following prefixes (+ section where they are described):

NPx: cl.9/10 (4.1)
SC/OC: 1SG (6.2.2)

Prenasalization occurs at the beginning of a word only in case of a SC of 1SG. As will be shown in the sections 4.1 and 6.2.2, the prenasalized consonants of the chart in 2.1 are only a part of the result of these prenasalizations. The result of these prenasalization also includes the nasals, hw, s and h as well as mbw; below, we give these results, followed by an example.

\[
\begin{align*}
m & < \text{p} \quad \text{lu-paápa/di-máápa} \quad \text{wing} \\
n & < \text{t} \quad \text{i-neembo} \quad \text{elephant} \\
ny & < \text{ch} \quad \text{lu-chiýa/di-nýíya} \quad \text{root} \\
ng’ & < \text{k} \quad \text{i-ng’áánga} \quad \text{guinea fowl} \\
hw & < \text{hw} \quad \text{va-ngu-hwikile/va-hwikile} \quad \text{they should come to me} \\
s & < \text{s} \quad \text{ngu-suúme/suíme} \quad \text{I should buy} \\
\end{align*}
\]
Lorenz (1914:48) notes the existence of “ein nasales h” - [a nasal h] - which particularly appears with nasals. He in fact mentions the voiceless nasal which, as he remarks, began to disappear in more and more words at that time. He notes the nasal h in the examples where it was still audible, e.g., nhnyongo ‘snake’ (pl.: mihongo) and nhnyao ‘Yao person’ (pl.: vahao). We have found only one type of environment where a voiceless nasal optionally appears in Chinnima nowadays: 2PL of tenses with zero tense marker with -hwika ‘arrive’, e.g. the Optative, where next to m-mwiike ‘you (pl) should arrive’ also m-hmwiike is possible. The voiceless nasal starts with a short airstream through the nose while articulating the nasal; the nasal is voiceless, though there may be a very short final voiced phase. In one other dialect, Chindonde, voiceless nasals are retained in many words. The voiceless nasals in Chindonde are hm, ẖn, ẖny and ẖng’.

Although there are examples of voiceless nasals within (verb) stems, in most words, voiceless nasals occur stem-initially. There are two specific environments where voiceless nasals appear. These environments are after a syllabic nasal, and with prenasalisation; the processes which occur in these environments are similar to those in Chinnima (see above). The first environment is with syllabic nasals followed by the voiceless consonants (non-stops) h and hw, which become (voiceless) nasals.

The second environment where voiceless nasals appear is with prenasalisation of the voiceless stops, p, t, ch and k, not with other consonants.
Nowadays, there are words without voiceless nasals in this environment even in Chindonde. Some examples:

- lu-pambaahi/ji-mambaahi bamboo
- lu-täämbo/ji-näämbo trap
- lu-kaloongo/ji-ng’aloong’o throat

In some words, the singular form has a voiceless nasal while the plural does not.

- i-hnuula/ji-mnuula nose
- i-hnyümmba/ji-nyümmba house

A final note about Chindonde, there are examples of singular forms with a h where in the plural forms a h with stronger friction (noted h’) appears.

- li-pahu/ma-pahh’u lung
- chi-hing’ììno/vi-h’ììng’ììno elbow

### 2.3 Palatalization, depalatalization and labio-velarization

Palatalization of consonants (called frication by Hyman (2003)), as occurs with the addition of the causative extension y (‘i), occurs with most consonants. Some examples are the following.

- -ipyà make cut grass (cf. -ipa cut grass)
- -lekyà make leave (cf. -leka leave)
- -yahya make throw away (cf. -yaha throw away)
- -ivyà make steal (cf. -iva steal)

The hy is a palatalized h where the h has light friction (as occurs with labialized h, see below). With three consonants, palatalization changes their place and/or manner of articulation.

- l + ‘i → dy
- n + ‘i → ny
- ng’ + ‘i → ny

- -wadyà dress (cf. -wala put on clothes)
- -ng’anya make play (cf. -ng’ana steal)
- -penya make blow one’s nose (cf. -peng’a blow one’s nose)

It should be noted that the other causative extensions, -ih/-eh- and -is/-es-, may also appear instead of y (‘i).
Not all consonants may be palatalized; with the addition of a causative extension, they do not get the short extension y (‘i) but -ih-/eh- or -is-/es-. These consonants are ch, the consonants with incorporated vowel (ch, h, s), and the consonants w, ny, nj, ng; also causative y and passive w do not get the extension y (‘i), but the longer ones. Examples are the following.

-kocheha make poke (cf. -koche poke)
-yocheha make roast (cf. -yoche roast)
-toheha make touch (cf. -tohe touch)
-visiha be made angry (cf. -visa be angry)
-moweha make cut hair (cf. -moweha cut hair)
-panyiha make beat (cf. -panyiha beat)
-kunjih make fold (cf. -kunjih fold)
-lingiha make try (cf. -lingiha try)
-tonyeha make rain (cf. -tonyeha rain)
-tamwiha make love (cf. -tamwiha love, like)

Monosyllabic stems also get the longer extensions, e.g. -liha ‘make eat’ (cf. -lya ‘eat’), as well as some stems with three or more syllables having k as their final consonant. Some examples are the following.

-pwetekha make hurt (cf. -pweteka hurt)
-veleka make give birth (cf. -veleka give birth)
-pepeka be made narrow (cf. -pepeka be narrow)
-motokeha make fall (cf. -motokeha fall)
-hipukia make sprout (cf. -hipukia sprout)

Just as disyllabic stems, stems as -penekha ‘put sideways’ and -teleka ‘cook’ may appear with the short as well as with the long extensions: -penekha/-penekha and -telekanka/-telekanka. Stems with the final consonant (non-causative) y appear with the following extension(s):

-haiha make grind (cf. -haiha grind)
-ladya/taiha make put into (cf. -ladya/taiha put into)
-tedya/-teyeha make trap (cf. -tedya/-teyeha trap)
-meyeha make break off a piece (cf. -meyeha break off a piece)
-wiha make return (cf. -wiha return)

The stem -mala ‘know’ may appear with the following extensions: -madya/-mahi. See 6.3.2 for more details about the causative extension.

The consonant l also changes to d after the addition of the Perfective Final -ile (but not before -ite; see 7.1.4), e.g., -tidile/-tilite (cf. -tilite ‘run away’) and before the final -i with manner nouns (see 4.5.2), e.g., chi-cheedi ‘way of cutting’ (cf. cheela ‘cut’). The l does not change to d after addition of other extensions like the applicative (-il-) and neuter (-ik-), and also not in the case of the monosyllabic stem -lya ‘eat’.
With depalatalization, as occurs with the addition of the Perfective Final -ile, the
original consonants are restored and the 'i appears after the consonant l of
the Perfective Final (which become -idy). Some examples are the following.

- ipidy (cf. -ipya make cut grass, -ipa cut grass)
- lekidye (cf. -lekya make leave, -leka leave)
- ividy (cf. -ivy make steal, -iva steal)
- ng’anidye (cf. -ng’anya make play, -ng’an play)

There is one exception: the original l is not restored with depalatalization, e.g.,
-chedidy (cf. -chedya ‘make cut’, -chela ‘cut’); even the whole dy remains in place,
as can be seen with the addition of the applicative extension -il/-el- (which becomes
-idy/-edy-), e.g., -chedyedy.

Labio-velarization, as occurs with the addition of the passive w (’u), occurs with
most consonants. Some examples are the following.

- ipwa be cut (grass) (cf. -ipa cut (grass))
- pitwa be passed (cf. -pita pass)
- vikwa be put (cf. -vika put)
- yahwa be thrown away (cf. -yaha throw away)
- lombwa marry (of woman) (cf. -lomba marry (of man))

The hw is a labialized h where the h is pronounced with simultaneous lip rounding;
the h has light friction. It should be noted that the other (long) passive extension -iw-
/-ew- may also appear instead of w (’u).

Labio-velarization is not possible with the consonant v, nor with w and passive w; the
longer extension -iw/-ew- is chosen instead. Some examples are the following.

- iviwa be stolen (cf. -iva steal)
- mowewa be cut hair (cf. -mowa cut hair)
- tamwiwa be loved (cf. -tamwa love, like)

Monosyllabic stems also get the longer extension, e.g. -liwa ‘be eaten’ (cf. -lya ‘eat’).
From the stems with the final consonant (non-causative) y, we found the following
forms:

- haiwa be ground (cf. -haya grind)
- teywa/-teyewa be trapped (cf. -teya trap)

The passive forms of -mala ‘know’ are -malwa/-maiwa ‘be known’. From the
lexicalized causatives, we found the following forms:

- udywa/-udiwa be asked (cf. -udy a ask)
- kundanywa/-kundaniwa be mixed (cf. -kundany a mix)

See 6.3.7 for more details about the passive extension.
2.4 List of vowels

The five vowels as they are spelled in this book are listed below. Their corresponding phonetic symbols are given in square brackets.

\[ i \] [i] \[ e \] [e] \[ a \] [a] \[ o \] [o] \[ u \] [u]

The \( i \) is front/high, the \( e \) is front/mid, the \( a \) is front/low, the \( o \) is back/mid and the \( u \) is back/high.

2.5 Vowel harmony, imbrication and vowel anticipation

There are two instances of vowel harmony. One instance is restricted to verbal extensions with one of the high vowels \( i \) or \( u \), of which the vowel harmonizes with the vowel of the preceding syllable. The applicative -il-, the causative -ih- and -is-, the neuter/impositive -ik- and the passive -iw- occur as -el-, -eh- and -es-, -ek-, and -ew- respectively, when they follow a syllable with one of the mid vowels \( H \) or \( R \).

\[ -minya \] squeeze: \[ -hepa \] gather (fruit):
\[ -minyila \] -hepela
\[ -minyiha \] -hepeha
\[ -minyisa \] -hepesa
\[ -minyiika \] -hepeka
\[ -twala \] seize:
\[ -walila \]
\[ -walika \]
\[ -twaliwa \]
\[ -nowa \] be sweet: \[ -tang'una \] chew:
\[ -nowela \] -tang'unila
\[ -noweha \] -tang'uniha
\[ -nowesa \] -tang'unisa
\[ -noweka \] -tang'unika
\[ -nowewa \]

The separative extensions -ul- and -uk- only occur as -ol- and -ok- when they follow a syllable with the vowel \( o \).

\[ -chima \] shut, fasten: \[ -tepa \] stoop, bend down:
\[ -chimula \] -tepula
\[ -chimuka \] -tepuka
Verbal extensions with the low vowel a (as well as the Pre-Final -ang- and the Perfective Final -ile/-ite) do not change in any environment.

The other instance of vowel harmony occurs with Imbrication of the Perfective Final, where an harmonic vowel appears after the vowel of the penultimate syllable. The imbricated vowel occurs as e when the vowel of the penultimate syllable is e or o; it occurs as i when the vowel of the penultimate syllable is i, a or u. Vowel coalescence occurs with the penultimate vowels i, e and a, resulting in i, e and e respectively (see 7.1.4 for further details).

When all vowels of the verbal stem are a, like in -papata ‘follow’, Imbrication may further affect all these vowels, e.g. -pepete (next to -papete).

A similar process is found with some verbal stems where the vowel of the penultimate syllable seems to be imbricated in the first syllable. The imbricated stems are the more modern variants of the older forms without Imbrication.

An imbrication-like process is found with certain verbal stems as well as with nouns. With this process, a vowel seems to replace the vowel of the preceding syllable; for the time being, we call this process Vowel Anticipation (but further analysis might prove that in fact Imbrication occurs). Forms with the replaced vowel are the more modern forms.

-mata plaster a wall:
-matula
-matuka

-homa pierce:
-homola
-homoka

-uta pull:
-utula
-utuka

Verbal extensions with the low vowel a (as well as the Pre-Final -ang- and the Perfective Final -ile/-ite) do not change in any environment.

The other instance of vowel harmony occurs with Imbrication of the Perfective Final, where an harmonic vowel appears after the vowel of the penultimate syllable. The imbricated vowel occurs as e when the vowel of the penultimate syllable is e or o; it occurs as i when the vowel of the penultimate syllable is i, a or u. Vowel coalescence occurs with the penultimate vowels i, e and a, resulting in i, e and e respectively (see 7.1.4 for further details).

- -pikite < -pikita break away
- -chekete < -cheketa cut
- -papete < -papata follow
- -olwete < -olota point
- -tukwite < -tukuta run

When all vowels of the verbal stem are a, like in -papata ‘follow’, Imbrication may further affect all these vowels, e.g. -pepete (next to -papete).

A similar process is found with some verbal stems where the vowel of the penultimate syllable seems to be imbricated in the first syllable. The imbricated stems are the more modern variants of the older forms without Imbrication.

- -pweteka < -poteka wound, get hurt, be ill
- -pwechela < -pochela receive

An imbrication-like process is found with certain verbal stems as well as with nouns. With this process, a vowel seems to replace the vowel of the preceding syllable; for the time being, we call this process Vowel Anticipation (but further analysis might prove that in fact Imbrication occurs). Forms with the replaced vowel are the more modern forms.
2.6 Vowel dissimilation and final vowel raising

There are two processes that occurred in the Makonde dialects of Mozambique which have spread north to the southern Makonde dialect of Tanzania, Chindonde. The processes are currently spreading over the Northern Makonde dialect of Tanzania, Chinnima, which we describe in this dissertation. Remarkably, the most southern dialects which are spoken along the Ruvuma, Chimatambwe and Chimaraba (Chimaraba is also spoken along the coast) are not (yet) affected by these processes (we have no data from the other coastal dialect Chimachinga). One process might be called Vowel Dissimilation, the other Final Vowel Raising.

Vowel Dissimilation occurs with tri- and more syllabic verb stems with identical mid vowels e or o. With trisyllabic verb stems, the first vowel changes to a; with four-syllable verb stems, the first two vowels change to a. The verb stems contain an expansion or a lexicalized extension.

-teleka < -teleka cook
-pwachela < -pwechela receive
-chaketa < -cheketa cut, chop
-nang’ena < -neng’ena cut (with hands)
-matoka < -motoka fall
-tangola < -tongola speak
-alota < -olota point
-nanopa < -nonopa be hard
-kahamola < -kohomola cough
-papatola < -popotola wring out

Note that all vowels of the stem (except the Final) should be identical; for instance, when the penultimate vowel of four syllabic stems is different, Vowel Dissimilation does not occur: -nyonyomala ‘squat’, -lombolela ‘applaud’, -ngongomana ‘be curved’.

With nouns derived from these verb stems, Vowel Dissimilation is taken over.

chipwächéléélo/chipwéchéléélo utensil (cf. -pwechela receive)
chitangoódi/chitongoódi language (cf. -tongola speak)

The other process is Final Vowel Raising. The final mid vowels e and o of certain non-verbal forms are raised to i and u respectively.

muúti < muútwe head
chituundi < chituundwe anger
lutaánu < lutaáno story
ing’óówu < ing’óówo banana

-mu < -mo a(n), one
-nu < -no this

With some forms, the raising is found in non-final position.
Since Vowel Dissimilation and Final Vowel Raising are currently spreading over the Chinnima-area, forms with and without Vowel Dissimilation and Final Vowel Raising all are acceptable. But there are exceptions: the word for ‘head’, e.g., is *muútwë* in Chinnima; *muúti* generally is regarded as Chindonde. The speakers of at least the South-Western part of the area more and more use the forms with Vowel Dissimilation and Final Vowel Raising.

### 2.7 Vowel coalescence, glide insertion and liaison

Vowel Coalescence of two adjacent vowels within a word gives the following results (there are no examples of *e* and *o* in the position of V1, but see under Liaison below):

<table>
<thead>
<tr>
<th>V1 V2</th>
<th>Examples (no tones indicated in underlying forms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i + i → i</td>
<td>miíhi &lt; 'mi-ihi' pestles</td>
</tr>
<tr>
<td>i + e → ye</td>
<td>myéédi &lt; 'mi-edi' months</td>
</tr>
<tr>
<td>i + a → ya</td>
<td>vyáála &lt; 'vi-ala' fingers</td>
</tr>
<tr>
<td>i + o → yo</td>
<td>myoóngo &lt; 'mi-ongo' backs</td>
</tr>
<tr>
<td>i + u → yu</td>
<td>lyúúlo &lt; 'liulo' evening</td>
</tr>
<tr>
<td>a + i → i</td>
<td>kiíhi &lt; 'ka-ibi' little pestle</td>
</tr>
<tr>
<td>a + e → e</td>
<td>kéeelu &lt; 'ka-elul' little field</td>
</tr>
<tr>
<td>a + a → a</td>
<td>káál'a &lt; 'ka-ala' little finger</td>
</tr>
<tr>
<td>a + o → o</td>
<td>koóngo &lt; 'ka-ongo' little back</td>
</tr>
<tr>
<td>a + u → u</td>
<td>kúúmba &lt; 'ka-umba' little arrow</td>
</tr>
<tr>
<td>u + i → wi</td>
<td>lwíídi &lt; 'lu-idi' door</td>
</tr>
<tr>
<td>u + e → we</td>
<td>wéeelu &lt; 'u-elul' field</td>
</tr>
<tr>
<td>u + a → wa</td>
<td>lwááu &lt; 'lu-au' net</td>
</tr>
<tr>
<td>u + o → wo</td>
<td>lwóógo &lt; 'lu-ogo' cassava</td>
</tr>
<tr>
<td>u + u → u</td>
<td>múúmba &lt; 'mu-umba' arrow</td>
</tr>
</tbody>
</table>

Two adjacent vowels merge into one vowel which has the quality of the second vowel, and when the V1 is *i* or *u* and the V2 is not identical with V1, the glides *y* and *w* appear as well. From now on, we will call this merging process Vowel Coalescence/Glide Formation (VC/GF). There is no compensatory lengthening. The extra vowel after the V2 in the examples does not appear as the result of VC/GF, as can be seen with examples with a trisyllabic stem such as *mwikúumba* < *mu-ikumba* ‘turkey sp.’, but the extra vowel is due to the process Penultimate Lengthening (see 2.9). VC/GF applies post-lexically at a certain stage of the derivation (see 3.5.5).
There are some nouns where VC/GF of a and i resulted in e, and vowel coalescence of u and o resulted in o. The full list:

- méêho < `ma-iho eyes
- méêno < `ma-ino teeth
- ? méêdi < `ma-idí water
- móómi < `mu-omi healthy person (mwôómi also possible)
- moóngo < `mu-ongo back of body
- moóoto < `mu-oto fire

VC/GF generally does not apply successively to sequences of three vowels. It does not apply to tenses with a tense marker, the vowel of the tense marker being one of three vowels in a row. With tenses without a tense marker, it does not apply because there is no VC/GF between a subject concord and a object concord when the subject concord is a (see below); when the subject concord is u- or i-, the non-existant initial sequences wy or yw would occur. The only exception we found is with the Indirect Relative tense starting with a Pre-Initial with the vowel a, e.g., the “fixed” pa-

```
pwîwa < `pa-ú-iva when you steal
```

Sequences of four vowels are attested with Indirect Relatives with an object concord. But then, there is no VC/GF between the subject concord and the object concord. In the example below, there is VC/GF between the vowel of the subject concord and the vowel of the preceding pa-, and between the vowel of the object concord and the initial vowel of the stem.

```
púyîwa < `pa-ú-i-iva when you steal it (cl.9)
```

There are more restrictions on positions where VC/GF takes place. Within stems, there is no VC/GF:

- when the first of two adjacent vowels is e or a
- between two identical vowels

In the examples below, two adjacent vowels belonging to different syllables are separated by a dot.

```
u-të.ùúla to serve food
ku-yândâ.ùúka to be wide
u-ppyá.ìlìa to sweep
ku-ù.ùúla to fall ill
cf. li-kwaánda abces
cf. ku-dyúuha to revive
cf. ku-pwéêéka to hurt
```
There is optional glide insertion in all these cases: **kutéwúla**, **kuyándáwúúka**, **kupyáyíila** and **kuwúwúúla**; without glide insertion, the syllables of these forms do not fuse, but they remain separate syllables.

Within stems of nouns, there is also no VC/GF when the V2 is the vowel of the final syllable. In cases mentioned above (V1 is e or a, identical vowels), glide insertion is optional (not indicated in the examples below) with other stems. Glide insertion often occurs in other cases. (The rules are roughly as follows: the glide y is inserted when V2 is i, and also when V1 is i while V2 is e or a; the glide w is inserted when V2 is o or u, and also when V1 is o or u while V2 is e or a. However, we did not always find glide insertion in these cases; especially when u is V1 and i is V2, glide insertion rarely occurs.) It should be noted that we have not found an example of a verb stem with the V2 as the vowel of the final syllable (without a preceding glide).

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>chi-leč.u</td>
<td>beard</td>
</tr>
<tr>
<td>lu-vaá.u</td>
<td>rib</td>
</tr>
<tr>
<td>chi-pyáá.i</td>
<td>broom</td>
</tr>
<tr>
<td>chi-koó.o</td>
<td>banana</td>
</tr>
<tr>
<td>i-ngúú.wo</td>
<td>cloth</td>
</tr>
<tr>
<td>ma-uú.wa</td>
<td>flowers</td>
</tr>
<tr>
<td>lu-woó.i</td>
<td>rope</td>
</tr>
<tr>
<td>ku-móó.wa</td>
<td>to shave</td>
</tr>
</tbody>
</table>

For the rest, VC/GF within stems is obligatory.

Outside stems, between a prefix and a vowel-initial nominal stem, there is no VC/GF:

- when the stem is monosyllabic
- when the word is a name or loan word

(Glide insertion is indicated where it normally occurs.)

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>lii-i</td>
<td>egg</td>
</tr>
<tr>
<td>lii-ye</td>
<td>egg</td>
</tr>
<tr>
<td>lii-wu</td>
<td>ashes</td>
</tr>
<tr>
<td>lu-úuma</td>
<td>Ruvuma (river)</td>
</tr>
<tr>
<td>ma-uúmba</td>
<td>smells</td>
</tr>
<tr>
<td>? lu-úunjí</td>
<td>cleared thicket (pl.: dimúunjí)</td>
</tr>
<tr>
<td>li-uúwa</td>
<td>flower</td>
</tr>
<tr>
<td>di-yeémbé</td>
<td>mangos</td>
</tr>
</tbody>
</table>

In other cases, VC/GF is obligatory.

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>mwihi/mihi</td>
<td>&lt; `mu-ihi/mi-ihi pestle/pestles</td>
</tr>
<tr>
<td>chaanga/vyaanga</td>
<td>&lt; `chi-aanga/vi-aanga galago/galagos</td>
</tr>
</tbody>
</table>

We found one example where the inserted glide is y instead of the expected w. (This example is probably a loan and treated differently; it will be shown in 4.1 that class
10 nouns which are the plural of class 11 nouns with vowel-initial stems are regarded as starting with ə, e.g., lw-ááu/dí-njááu 'net': ku-yândiíka/kwándiíka 'to write'.

Outside stems, within verbal forms, there is no VC/GF:
- between a subject concord and an object concord or a vowel-initial stem when the subject concord is a-
- between a tense marker and an object concord with monosyllabic stems
  a-i-lolíte (s)he who has seen it/them (cl.9/4)
  cf. tw-i-lolíte they who have seen it/them
tu-ka-ii-lya if we eat it/them
tu-na-uu-lya we (will) eat it (cl.3 or cl.14)
tu-chí-úu-lya we were eating it

But there is always VC/GF in verbal forms between a subject concord and the following Far Past tense marker -a-.

  tw-á-ní-liíma < `tu-á-ní-liíma we had cultivated (long ago)
  tw-á-ná-liíma < `tu-á-ná-liíma we cultivated (long ago)

VC/GF is optional in other positions within verbal forms, except in case of a vowel-initial stem preceded by the object concord `-mu-' of class 1, which becomes `-mw-'.

  ku-úudyá/kúúdyá to ask
  ku-ikáála/kwikáála to live
tu-iíve/tw-iíve we should steal
tu-ní-imba/tu-níimba we sang
u-na-iíve/u-nííve you should not steal
tu-ka-lólóla/tu-ki-lólóla if we look at it (cl.9)
tu-na-chi-iíva/tu-na-chiíva we (will) steal it
va-ká-tú-uudýa/va-ká-túudyá they do not ask us
tu-mw-iíve we should steal it (e.g. a cow)

A consequence of VC/GF is tonal coalescence; this process is dealt with in 3.5.5. Although not dealt with there, a consequence of Liaison is also tonal coalescence, and the results are the same as those of VC/GF.

Liaison of two adjacent vowels across a word boundary gives almost the same results as vowel coalescence within a word. In addition, there are examples for e and o in the position of V1. The only example we found of e as V1 and a as V2 was preferably used without liaison; fast speech resulted in ya.

V1 V2    V1 V2
  e + i → i    o + i → wi
  e + e → e    o + e → we
  e + a → (ya)  o + a → wa
  e + o → o    o + o → o
  e + u → u    o + u → o
Liaison mainly occurs between a verb and a following (object) noun or (head-less) specifier.

- **ndolít’ìng’áande**  \(<\) **ndolite ìng’áande**  \(\) I looked at the house
- **vannolít’iéme**  \(<\) **vannolite ééme**  \(\) they looked at Emé
- **vannolity’ááli**  \(<\) **vannolite ááli**  \(\) they looked at Ali
- **vannolít’óóki**  \(<\) **vannolite óóki**  \(\) they looked at Oki
- **vavalolít’úúóovó**  \(<\) **vavalolite úúóovó**  \(\) they looked at them
- **vannw’íima**  \(<\) **vanno(la) íima**  \(\) they look at Ima
- **vannw’céeme**  \(<\) **vanno(la) ééme**  \(\) they look at Emé
- **vannw’ááli**  \(<\) **vanno(la) ááli**  \(\) they look at Ali
- **vann’óóki**  \(<\) **vanno(la) óóki**  \(\) they look at Oki
- **vavaló’úúovó**  \(<\) **vavalo(la) úúóovó**  \(\) they look at them

Liaison also occurs within complex verbal forms as well as between the index forms (\(\text{na-}\) and the associative \(\text{PPx-a-}\)) and a following noun. It is generally refused between a noun and specifier as well as between two specifiers.

### 2.8 Surface syllable structure

On the surface, the following types of syllables occur (\(\text{NC}\) represents a prenasalized consonant, \(\text{N}\) represents a syllabic nasal, \(\text{G}\) represents a glide):

- \(\text{V} \quad \text{VV} \quad \text{GV} \quad \text{GVV} \quad \text{N}\)
- \(\text{CV} \quad \text{CVV} \quad \text{CGV} \quad \text{CGVV}\)
- \(\text{NCV} \quad \text{NCVV} \quad \text{NCGV} \quad \text{NCGVV}\)

The nucleus (or peak) of a syllable consists of a vowel or a syllabic nasal, each of which counts as one mora. The mora is the Tone Bearing Unit (TBU, see 3.3). The syllabic nasal has a restricted distribution: it is a prefix, generally not occurring in final and prefinal position in words (see below). The syllables with two vowels occur post-lexically, and they also have a restricted distribution: they occur in penultimate position in phrase-final words, where the vowel is automatically lengthened by the post-lexical process Penultimate Lengthening. (In the examples below, syllables are separated by a dot).

- **ku-pyá.íí.la** to sweep
- **i-nóó.ndwa** star
- **tu-ká-ya.ngé.te** we have not helped
- **lu-wáá.ni** fence
- **tu-na-lyaa.nga** we (will) eat a lot
- **li-ngwéé.łe** baboon
- **n-nóó.me** man, husband
- **ń-ndóó.nde** Ndonde person
Rarely also occur syllables with three TBU’s.

- VVV 
- GVVV
- CVVV 
- CGVVV
- NCVVV 
- NCGVVV

These types of syllables also occur post-lexically; they only occur as penultimate syllables of phrase-final words consisting of disyllabic stems in the tenses Relative Present and Relative Perfective, as well as penultimate syllables of phrase-final words containing certain nominal and pronominal stems where syllable fusion has taken place. All these cases are the result of blocking of the process Structure Simplification (3.5.6 and 3.5.8).

- a-iii.va (s)he who steals
- ndiima I who cultivate
- tu-wée.te we who have put on clothes
- mbwáa.la I who put on clothes
- chi-loó.ngo pot
- mwéeé.nu you (pl.)

The syllabic nasals are homorganic; they are representations of the syllable mu of certain class prefixes and concords (cl.1, 3 and 18; 2PL) before other than monosyllabic stems.

- n-neémba 1 boy (before initiation)
- m-piíni 3 handle
- n-chiloóongo18 in the pot
- tu-u-táamwe we should like you (2PL)
- muú-nu 1 person
- tu-múú-lye we should eat it (e.g. n-kóoko cl.1 animal)

In some cases, an allomorph of the syllable ngu of the concords for 1SG is represented by N, i.e., prenasalisation of the following consonant occurs, followed by cluster reduction in most cases (see 6.2.2).

- va-ngu-táamwe/va-náamwe they should like me

There is syllable fusion between a syllable and a following syllabic nasal (which is a TBU). The nucleus of the fused syllable consists of two TBU’s. This process also occurs between words. In the examples below, the high-toned syllabic nasal raises the preceding TBU of the syllable with which it has been fused (see 3.5.8).

- tu-náp-táamwa we (will) like him (object concord cl.1)
- va-mwoná nj-núme they see the man

There is even a case where syllable fusion of three syllables results in a syllable with three TBU’s: the second syllable in the complex tense va-veéji-kúlima; this form is derived from va-velé-ji-kúlima ‘they are cultivating’, where the 1 of -vele- is omitted and three syllables are fused to one syllable (see 3.5.8 and 7.4).
2.9 Penultimate lengthening and penultimate shortening

There is no phonologically distinctive vowel length. But the penultimate syllable of phrase-final words is automatically lengthened by the post-lexical process PenUltimate Lengthening (PUL). Words in citation form, as the examples given in the preceding sections, are considered to have the same form as phrase-final words. A description of PUL is given in 3.2 and 3.5.1. In the examples below, PUL marks the end of a phrase, indicated by the sign ‘]’.

We see the men only in the morning
we see the young children only in the morning

The underlying forms of the forms with PUL in the first phrase are ´valúmé and ´vakănunú. These forms appear when they occur as non-final words in phrases.

valúmé vááno these men
vakănunú veétu our young children

Phrase-finally, PUL occurs followed by Retraction of the final H tone (R, see 3.5.2).

However, the lengthened penultimate syllable of non-final phrases may be reduced with fast speech. This process, PenUltimate Shortening (PUS), is described in 3.5.9.

We see the men only in the morning
we see the young children only in the morning

The forms valúme and vakanunú are derived from the forms with PUL (plus a tone rule in the second form), not directly from their underlying forms.