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3. Tone

3.1. General facts

This first paragraph establishes some general facts of the Lumun tonal system: its tonemes, the tone-bearing unit, and the distribution of tones.

3.1.1. Four tonemes

Lumun can be analysed as having four tonemes: high (H), low (L), falling (HL) and rising (LH). These tones are contrastive in prepausal positions, cf. the following words. Low tone is unmarked. Notably, the words with a rising tone are not actually pronounced with a contour, but —as a whole— at a pitch that remains level (see 3.2.2). When in non-prepausal position it becomes clear that a high tone is underlingly involved here (see 3.3.1).

<table>
<thead>
<tr>
<th>L vs. H</th>
<th></th>
<th>L vs. HL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kərgb</td>
<td>‘farming field’</td>
<td>kərbɡ</td>
<td>‘bellies’</td>
</tr>
<tr>
<td>ndərɛ</td>
<td>‘work’</td>
<td>ndɛrɛ</td>
<td>‘honey’</td>
</tr>
<tr>
<td>kəpɑn</td>
<td>‘bowl (k.o.)’</td>
<td>kəpɑn</td>
<td>‘meat’</td>
</tr>
<tr>
<td>paɔn</td>
<td>‘rat’</td>
<td>maɔn</td>
<td>‘fingers’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L vs. HL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>aʊn</td>
<td>‘rats’</td>
</tr>
<tr>
<td>ŋpit</td>
<td>‘edge’</td>
</tr>
<tr>
<td>ŋtulɛɾæk</td>
<td>‘lightening’</td>
</tr>
<tr>
<td>əʊlɔ</td>
<td>‘step aside’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>L vs. LH</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kʊɾi</td>
<td>‘family member’</td>
</tr>
<tr>
<td>erɛ</td>
<td>‘speak’</td>
</tr>
<tr>
<td>ŋtʊɾan</td>
<td>‘theft’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H vs. HL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>kunu</td>
<td>‘ear’</td>
</tr>
<tr>
<td>parĩ</td>
<td>‘wife’</td>
</tr>
<tr>
<td>aɾaŋkâl</td>
<td>‘bed’</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>kunu</td>
<td>‘scorpion’</td>
</tr>
<tr>
<td>parĩ</td>
<td>‘tree (sp.)’</td>
</tr>
<tr>
<td>aɾaŋkâl</td>
<td>‘name-sharers’</td>
</tr>
</tbody>
</table>
3.1.2. Tones on vowel sequences: counting morae

On diphthongs, it is possible to have more complex tonal contours, in which a low tone on the first part of the diphthong is followed by a falling tone, or by a rising tone, e.g.,

- **côân** ‘rat (sp.)’
- **côâl** ‘sack’
- **kôâ** ‘digging tool’
- **kaôn** ‘bee’
- **êô** ‘go’
- **tuân** ‘(at) home’
- **têôô** ‘beard’
- **tôkôô** ‘head pad’
- **môôô** ‘spell, disease’
- **waôôô** ‘cow’

**îttuôôô / îttiôôô** ‘very (modifying ɔ-rôô ‘red’ or ɔôa ‘become red’)’

The words with a rising tone (always in final position) are not pronounced with a contour but at a slightly raised pitch that remains level.

There are also some examples of complex tonal contours on long vowels:
tuôn  ‘cultivating tool’
ěê  ‘stab, blow’
ząk  ‘s/he’
naâk  ‘on him/her’

C-a-ār  ‘muddy’ (< C-ā- ‘of’ + ṇār ‘mud’)

Words with a low-falling tone on a diphthong or long vowel can be opposed to words with a high-low tone on a diphthong or long vowel (the derivation between parentheses is explained further below):

kuâ  ‘digging tool’
ŋkúa  ‘with the strand of hair’ (< ṇ-kúa < ñ- ‘with’ + kua ‘strand of hair’)

Words with a low-rising tone on a diphthong or long vowel can be opposed to words with low-high on a diphthong or long vowel:

C-aār  ‘muddy’
ŋaâk  ‘oil’
waį  ‘cow’
paį  ‘tamarind tree’

The oppositions show that it is useful to take the mora, not the syllable as the unit on which a toneme —low, high, rising or falling— is realized. If the syllable were taken as the counting unit, ŋkúa could be regarded as having a falling tone realized on a syllable, but for words like kuâ a more complex LHL contour would have to be posited. Likewise could the tones on ŋaâk and paį be regarded as realizations of the rising tone on a syllable, but then the tones on C-aār and waį (realized at a slightly raised level pitch) would have to be posited as single more complex tones. The mora as the counting unit offers the possibility of regarding the diphthong of ŋkúa as underlyingly falling + low (realized as high + low) and kuâ as low + falling. With the mora as counting unit ķaâk and paį are not seen as realizations of a rising tone on a long vowel or
diphthong, but as low + high, whereas c-aar and waAf both have a low + rising tone.

The mora as the unit on which a toneme is realized raises the expectation that on a diphthong or long vowel also high-falling and high-rising sequences might be possible (contours on single morae are always in pre-pausal position). High-falling sequences indeed occur, but only due to tone bridge (tone-bridge will be discussed in 3.5, the tonal derivations between parentheses show the application of the Tone Shift Rule and the Contour Simplification Rule, see 3.3.1 and 3.3.2):

ca c6-coan ‘the head of the rat (sp.)’
(< ca c5-_cu6n < ca c5- cu6n < ca ‘head’ + c-a ‘of’ + cu6n ‘rat (sp.)’)

High-rising sequences on a diphthong or long vowel are not attested.

Further arguments for the mora as counting unit

The tonal phenomena upon attachment of the prepositional proclitics i- ‘in’, nɔ- ‘on, at’, tɔ- ‘up on, up at’ and tɔ- ‘at’ provide a further argument for the mora as counting unit (or the unit of attachment for the toneme). Upon prefixation of i- ‘in’, nɔ- ‘on, at’, tɔ- ‘up on, up at’ and tɔ- ‘(down) at’ to a low-toned noun, the second mora of the noun becomes falling. If, however, the noun has only one mora, this mora becomes falling. If the noun has more than two morae, the falling tone on the second mora is simplified and realized as high (Contour Simplification Rule, see 3.3.2). Examples:

i-kwâ (< i- + kwa ‘chaff’) ‘in the chaff’
na-pallâ (< na- + palla ‘cat’) ‘on the cat’
i-narɔŋkwan (< i-narɔŋkwan < i- + narɔŋkwan ‘grasshoppers (sp.)’) ‘between the grasshoppers (sp.)’

Diphthongs count as two morae:
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ɪ-t̪ɪk (≤ ɪ- + ɬɪk ‘suffering’) ‘in suffering’
ɪ-aʊn (≤ ɪ- + ɬʊn ‘rats’) ‘among the rats’

Also the next example shows that the mora rather than the syllable is the carrier of tone. A word-final high tone becomes low in non-prepausal position and can reappear on the first mora of a following word (see the rules of Tone Shift and Contour Simplification, 3.3.1 and 3.3.2). The first noun in the example below has high-toned diphthong. When something follows, it is only the high tone on the last mora that becomes low (and reappears on the first mora of the following word):

kapı unsett k-ə-pul ‘the jaw of the person’
(≤ kapı unsett k-ə-pul < kapı unsett ‘jaw’ + c-ə- ‘of’ + pul ‘person’)

Mora-counting is, however, not without problems. Long vowels behave differently from diphthongs upon attachment of one of the prepositions ɪ- ‘in’, na- ‘on, at’, tə- ‘up on, up at’ and ɬə- ‘(down) at’.
They pattern with short vowels, and not with diphthongs, e.g.,

ɪ-cáa ‘in the grape’ (instead of *ɪ-caá)
(≤ ɪ-cáa < ɪ- ‘in’ + caa ‘grape’)

ɪ-ɛɛ ‘in the poison’ (instead of *ɪ-ɛɛ)
(≤ ɪ-ɛɛ < ɪ- ‘in’ + ɬɛɛ ‘poison’)

And in (at least) one case of a diphthong, there are alternative tonal realizations:

ɪ-maɪ / ɪ-maɪt (≤ ɪ- ‘in’ + maɪt ‘beans’) ‘in the beans’

In some items with a low + falling or a low + rising tone on a long vowel or diphthong it is clear that this long vowel or diphthong comes from loss of a velar nasal between vowels belonging to adjacent morphemes. Examples are ə-ɘk ‘s/he’ (≤ ə- + ɬək), na-ɘk ‘on him/her’ and ɪ-aɬk ‘in him/her’, which apart from, respectively, the prepositional proclitic na- ‘on, at’ and ɪ- ‘in’, contain the 3rd person singular formative ɬək (see also the chapter on pronouns).
C-a-r ‘muddy’, from C- of + ŋ ār ‘mud’ is another example of loss of a velar nasal. C-a-r, however, is not pronounced with a (complex) contour, but at a slightly raised pitch which remains level, and can also be pronounced with a short vowel (C-ār). In the case of C-aIk ‘be’ the diphthong with low + falling tone comes from historical loss of an oral palatal between vowels (< C-á ‘be’ + the vague reference particle cĩk). C-aIk ‘be’ and cĩk are discussed in chapters 12.7.1 and 15.2.1, respectively.

Long vowels in (real) roots are rare. And also in such cases, the long vowel may well stem from historical loss of a consonant (a velar nasal?) in between. In (real) roots the long vowel may function as a single tone bearing unit.

In view of the opposition on diphthongs and long vowels between H.L and L.HL patterns on the one hand, and L.H and L.LH patterns on the other hand, and in view of the occurrence of cases like i-ṯāk ‘in suffering’ with the second low mora of a diphthong becoming falling, and kapii̯et k-ẹ-pul ‘the jaw of the person, with the high tone on the second mora of diphthong becoming low (and reappearing on the next word), the mora as counting unit offers an easier way to describe the tonal phenomena in the language than the syllable.

3.1.3. Tone on nasals

Proclitics that consist of only a nasal can carry a tone. These proclitics are the subject pronominal clitics ń- ‘I’, ń̃- ‘you (sg)’, ń̃- ‘you (pl)’ and ń̃- ‘they’, and the prepositional clitic ń- ‘with, by, (away) from’. In the examples below, the nasal proclitics are also marked for tone in case of a low tone (in the other examples in this book the nasal proclitics are only marked for tone when they have a high tone). Notably, the clitics with high tone of their own are realized low in context, due to Tone Shift (see 3.3.1); the clitic with falling tone is realized high in context due to Contour Simplification (see 3.3.2).
In the chapter on segmental phonology it was shown that a tone on the very short vowel ə may rather be realized on an adjacent (geminated) sonorant or on the nasal part of nasal and stop cluster.

3.1.4. Distribution in other than prepausal position

In other than prepausal position, the distribution of the tones is different. Contour tones are in principle not allowed on a non-prepausal short vowel (a single mora). When, due to phonological and morphological concatenations, a falling tone is expected to appear on a non-prepausal single mora, it is simplified; for more details see 3.3. Rising tones on a (underlyingly) single mora occur only in prepausal position.

On long vowels and diphthongs, contour tones are found in all positions. In other than word-final position these contours generally arise from a morpho-phonological process. Under the mora-approach, I do not analyse such tones as falling or rising tones on a long vowel or diphthong, but as resulting from the combination of two tonemes.
E.g., in the first example below the falling surface tone on the long vowel can be regarded as a sequence of a falling (realized as high) and a low tone underlyingly. The rising surface tone on the diphthong in the second example can be analysed as consisting of a low and a falling (realized as high) tone underlyingly:

\[ \text{őtúolf} \quad \text{‘Hyena (as a nickname)’ (} < \text{őtúolf} < ő + túolf ‘hyena’) \]
\[ \text{őné} \quad \text{‘go to’ (} < \varepsilon\text{öt} ‘go’ + -me) \]

Long vowels that arise across morpheme boundaries are often shortened phonetically; under such circumstances a sequence of high and low can give rise to a falling tone on a phonetically short vowel. Thus, for example, when the proclitic subjunctive particle \( \text{á} \) is attached to a following \( \text{a} \)-initial element, the result is a long vowel with a contour tone, which, consequently, tends to be pronounced shortened:

\[ \text{ámmá k-kw-áá.t} \quad \text{á-ant-ő} / \text{ánt-ő} \quad (} < \text{á- ant-ő} \]
\[ \text{if 3-c-come:COMPL SUBJ-(2)-can:DEPINCOMPL-go:DEPINCOMPL when she arrives, you can go} \]

In fast speech, falling contours arising from morphological processes, can be simplified to a high tone on a short vowel. In the example above \( \text{ánt-ő} ‘\text{you can go}’ \) can also become \( \text{ánt-ő} \).

Notably, also before other consonants than nasals (and the lateral) a falling tone on a short vowel can arise from morpheme attachment. \( \text{ács} \) in the example below results from \( \text{á} + ő + \text{cs} \).

\[ \text{á-cs muccú m-őtůkkwa.t cakarůk} \]
\[ \text{SUBJ-(2)-string:DEPINCOMPL beads c-be_coloured:COMPL also you (must) also string beads of different colours (App. III, 16)} \]

Similarly, when the proclitic conjunctive particle \( \text{á} \)- becomes adjacent to another \( \text{a} \) (or to a vowel that assimilates to it) a long vowel with a rising contour tone may result. The long vowel tends to be pronounced shortened, in which case the rising contour may be simplified to high:
a-átaɾəpə / átaɾəpə … ‘and the rabbit …’
(< a-átaɾəpə < å- + ɲaɾəpə)

A rising contour is further found on the verbal negation marker ânn-. Here, however, no rising toneme is involved. The element ânn- is a shortened form of akónn-, which itself is a shortened form of akórrənə. Apparently, ânn is underlyingly a diphthong (aânn) with a low + high tone, but shortened phonetically. Notably, the rising tone on the shortened negation marker ânn cannot be simplified to just a high tone.

ɔkʊł w-ânn-ɔllɔ
c-hild C-NEG-PUR-DIEPCOMPL

the child did not run

3.2. The phonetic realization of the tones

This section gives an idea of the phonetic realization of the tones. The transcriptions between square parentheses are based on whistling by the consultants.

3.2.1. Prepausal low tone

A prepausal mora with low tone is pronounced with a slight downglide. Some words follow here which have this final downglide in prepausal position.

<table>
<thead>
<tr>
<th>Word</th>
<th>Meaning</th>
<th>Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>kat</td>
<td>‘grasshopper(s)’</td>
<td>[₁]</td>
</tr>
<tr>
<td>palla</td>
<td>‘cat’</td>
<td>[₁₁]</td>
</tr>
<tr>
<td>akkarɔ</td>
<td>‘call’</td>
<td>[₁₁₁]</td>
</tr>
<tr>
<td>cuman</td>
<td>‘bone’</td>
<td>[₁₁₁₁]</td>
</tr>
<tr>
<td>apɔɾilakɔ</td>
<td>‘hang (with hands)’</td>
<td>[₁₁₁₁₁]</td>
</tr>
</tbody>
</table>

When a high tone precedes a single prepausal low tone within the word, downglide is difficult to hear (first example below). It is more clearly audible in case of more prepausal low-toned morae preceded by a H-tone within the word (second example below).
mpímma pólla ‘I will see the cat’ \([-\_\_\_\_\] or \[-\_\_\_\_\]
mpímma tɔmɔcco ‘I will see the old man’ \([-\_\_\_\_] or \[-\_\_\_\_\]"

3.2.2. Rising tone on short (prepausal) vowels

A rising tone on a (underlyingly) single prepausal mora is never pronounced as rising. Unlike the falling tone in prepausal position, the rising contour cannot as a whole be realized on one mora: in prepausal position the high part of the contour remains unrealized (NB: in context it becomes clear that this tone involves a high part, see 3.3.1).

A couple of phonetic cues make the contrast between the rising and the low tone in prepausal position. In the first place, unlike in prepausal low tones, there is no downglide. In the second place, isolated nouns with a rising tone are, as a whole, realized at a slightly raised pitch as compared to all-low nouns. The differences are clearly audible in the following pairs (though the initial pitch difference, tends to be somewhat smaller than in the transcriptions below):

<table>
<thead>
<tr>
<th>Noun</th>
<th>Meaning</th>
<th>Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>kat</td>
<td>‘grashopper’</td>
<td>([-_] )</td>
</tr>
<tr>
<td>kit</td>
<td>‘wild chicken’</td>
<td>([-_] )</td>
</tr>
<tr>
<td>pɛɽɔŋ</td>
<td>‘palm tree’</td>
<td>[-__]</td>
</tr>
<tr>
<td>cɔɽɔŋ</td>
<td>‘mountain’</td>
<td>[-__]</td>
</tr>
<tr>
<td>tɔmɔcco</td>
<td>‘old man’</td>
<td>[-____]</td>
</tr>
<tr>
<td>tɔmekɔ</td>
<td>‘scarification’</td>
<td>[-____]</td>
</tr>
</tbody>
</table>

The difference between rising and low tones is consistent when words are given in isolation. However, when such nouns occur in sentences (but still before a pause), it is often possible to pronounce the rising tone in the same way as a low tone, i.e. with low pitch and slight downglide. In isolation the words tɔk ‘dog’ and karjttan ‘knife’ have a rising tone.
Also in the following cases, there are two possibilities for the realization of the rising tone in prepausal position: as a rising tone (there is a smaller pitch interval with the preceding high tone and no downglide) and as a low tone (there is a bigger pitch interval with the preceding high tone and some downglide). The noun ṭorā ‘cultivating’ has a rising tone in isolation, the proclitic connexive particle ko ‘of’ is realized high due to preceding kirék ‘hoe’:

kirék k-ṣ-ṭorā ‘a hoe for cultivating’  [−−−−]
kirék k-ṣ-ṭora ‘a hoe for cultivating’  [−−−−]

The two realizations are equivalent in the sense that they raise no expectation of anything following, and that no specific emotion is conveyed. Nevertheless, it is well possible that in certain pragmatic contexts the one tends to be used rather than the other. Physical distance is also a factor that may be of influence. According to one of the consultants (JS), when speaking to somebody who is at a distance, the variant with the rising tone is more likely to be used than the variant with low-tone realization.

The exact conditions of the neutralization of low and rising tones in prepausal position are not clear, and would need further investigation.

When a word with a rising tone follows one or more all low words (or words realized as such), these low tones and the following word with rising tone are pronounced at the same pitch level. This pitch level is (often) not the level of an isolated low word (such as pol ‘person’ in the first example below) or of the initial mora of a word that is low + high in isolation (such as aţik ‘come!’ in the second example), but the slightly raised pitch level of isolated words with a rising tone:
3.2.3. High and falling tones

A falling tone is initiated at a somewhat lower pitch than a high tone (but at a higher pitch than an item with a rising tone). This can, for example, be observed in the following pairs:

\[
\begin{align*}
\text{cǐt} & \quad \text{‘eye’} \quad [-] \\
\text{cēn} & \quad \text{‘palm fruit’} \quad [\sim]
\end{align*}
\]

\[
\begin{align*}
\text{kunú} & \quad \text{‘ear’} \quad [- -] \\
\text{kunû} & \quad \text{‘scorpion’} \quad [- \sim]
\end{align*}
\]

3.2.4. Downdrift and downstep

Within a clause there can be some downdrift: a high tone following a low tone can be realized at a slightly lower pitch than a preceding high tone, and a low tone following a high tone at a slightly lower pitch than a preceding low tone. Word-internally this is possible as well. Downdrift effects tend to be light and do not continue over long stretches of speech.

In the following sentence there is some downdrift. The high tone on ‘four’ is realized at a slightly lower pitch than the preceding stretch of high tones, while ‘cows’ is realized a little lower than the initial low tone, and the low tones on ‘four’ a little lower than those on ‘cows’:

\[
\begin{align*}
pʊl & \; r-p-ɪpʊkɪppōk \; \text{‘a very white person’ } [- - - -] \\
ərɪk & \; nəppān \; \text{‘come inside!’ } [- - - -]
\end{align*}
\]

\[
\begin{align*}
ɛjɛntɛři & \; c-aat \; n-τɛ-ττʊk \; \text{‘come inside!’ } [- - - - - - - -]
\end{align*}
\]
kəllán  ét-k-í  k-ônó  kje  k-ôcørn [---]  
old_woman  DEM-C-NEARSP  c-have  cows  c-four

this old woman has four cows

There is no downstep in Lumun. A downstep effect might be expected in cases of a word-final falling contour tone which is directly followed by an initial high or falling tone. In such cases, the contour tone becomes high (see the Contour Simplification Rule, 3.3.2), but it does not influence the pitch-level of the following high tone, which is on the same level. Some examples:

kəllán  k-ére  (< kəllán kéré)  [---]  
old_woman  c-speak

the old woman will speak

ɔ-kôkkô-ðn  (< ɔ- + kôkkô + -ðn)  [---]  
PERS-Kôkkô-PL

Kôkkô and his group

3.2.5. Graphs of phonetic realisations

A few graphs showing phonetic realizations of the four tone patterns on monosyllabic nouns are presented here, as well as a clause. The nouns and the clause are produced by Nafisa Abdullai (at the time ca. 19 years old). In each picture, the second representation is set out on a vertical scale ranging from 100 to 400 Hrz.

Graph 1. kat ‘grasshopper(s)’
Graph 2. ŋok ‘dog’, lōk ‘dogs’

Graph 3. cǐt ‘eye’

Graph 4. cǐl ‘grain of sorghum’
TONE

Graph 5. ‘and I like to talk about the singing whip like this’

\[\text{ana mpọọtë itti mpɛɛ̃ n̥-kammia ittinā}\]

and I like that I talk on-singing whip like this

and I like to talk about the singing whip like this (App. II, 30)

3.3. Tone rules

There are a number of tone rules that apply within the sentence (or in a smaller domain before a pause).

3.3.1. Tone shift

Word-final high and rising tones in non-prepausal position undergo specific changes.

Tone Shift Rule: When a word with a (underlying) final high tone is followed by another word, the final high tone becomes low. The high tone reappears on the first mora of the following word if this mora is low (this can be called tone shift), leading to a HL contour. The same behaviour is found with the high part of a rising tone (as mentioned earlier, rising tones (on a single mora) only occur word-finally).

\[\text{m-pọọkọt}\ kāt\quad (\text{< mọọkọt kat})\]

1-C-eat:COMPL grasshopper(s)

I have eaten grasshoppers
Certain grammatical words as well as words containing certain grammatical morphemes have a floating high tone. These words have a final low tone in isolation but bring a high tone to the first mora of a following word if this mora is low, leading to a HL contour. These words thus behave in accordance with the Tone Shift Rule. In non-prepausal position their final mora is realized low (as it would be, in these cases, in prepausal position as well), while their floating high tone appears on the first mora of the following word if this mora is underlyingly low, leading to a HL contour.

The following example with the Incompletive verb mpakōta ‘I will look’ illustrates the effect of application of the Tone Shift Rule. This verb, which is based on the verb okāta ‘look at/after’ (see 12.4 for the segmental and tonal shape of verbs), has a final low tone in isolation, but when followed by a low-toned word, it imposes a high tone on the first mora of that word, leading to a HL contour:

\[
\begin{array}{ll}
\text{mpa}.kōta & pōl \\
\text{1-C-look:INCOMPL} & \text{person}
\end{array}
\]

I will look at/after the person

An example is also the conjunction word ana ‘and’. In isolation it is pronounced as all-low, but a high tone appears on the first mora of a following low noun, leading to a HL contour:

\[
\begin{array}{ll}
papōkira & \text{ana} & kāt \\
\text{leopard} & \text{and} & \text{grasshopper}
\end{array}
\]

the leopard and the grasshopper

3.3.2. Simplification of a falling (HL) contour

On a single mora, a falling contour only occurs in prepausal position (this can be different in case of shortened long vowels). The following tone rule applies:
Contour Simplification Rule: A falling contour (on a single mora) is realized as a high tone, except in prepausal position.

The Contour Simplification applies after Tone Shift.

The Contour Simplification Rule predicts that there are no falling tones on short vowels in any but prepausal position. In isolation, the word kəllán 'old woman' has a falling tone, kwɔk 'shoe' has a low tone. In context, the contour tone of kəllán becomes high:

```
m-p-ɛtə kəllán kwɔk
 1-c-give:INCOMPL  old_woman  shoe
```

I will give the old woman the shoe

The non-prepausal falling tone is realized as high, irrespective of the tones of the following item:

```
mpɛtət kəllán tʃ  'I will give the old woman the thorn'
mpɛtət kəllán tək  'I will give the old woman the dog'
mpɛtət kəllán cɛn  'I will give the old woman the palm fruit'
```

Tone Shift leads to a HL contour on the first mora of the following word if this mora is low. If this mora is not in prepausal position, Contour Simplification applies. Some further examples follow here. The first two below involve the connexive proclitic c-ɔ- 'of' (see 7.1).

```
c-a  c-ɔ- pɔlla  (< c-a  cɔ-poł < c-a  cɔ- pɔlla)
head  c-of-cat
the head of the cat

kærɨttaŋ  k-ɔ-puł  (< kærɨttaŋ kɔ-puł < kærɨttaŋ kɔ- puł)
knife  c-of-person
the knife of the person

m-p-a.kətə  tʊt̪tərʊk  (< mpakətə H tuţtərʊk)
1-c-look:INCOMPL  pig
I will look at/after the pig
```
In the next example, the first word has two high tones, the first of which stays in place, while the last mora becomes low. The high tone of this last mora reappears on the initial mora of the next word:

\[ \text{alápiríår w-ş-pu} \quad ( < \text{alápiríår w-ş-pu} < \text{alápiríår w-ş-pu}) \]

the prayer mat of the person

Tone Shift applies first, then Contour Simplification. This is illustrated by the following example, which shows that a high tone derived from a falling contour does not shift further (irrespective of whether the falling tone belongs to the lexical item (first example below, with \( \text{pəɾemē} \) ‘Acheron person’) or is generated by the preceding item (second example below, with \( \text{pəl} \) ‘person’). In the first example only Contour Simplification applies, in the second first Tone Shift, then Contour Simplification).

\[ \text{m-p-êtet pəɾemē kôm모k} \quad ( < \text{mpêtet pəɾemē kômモk}) \]

I have given the pot to the Acheron person

\[ \text{m-p-a.ɾêkme pəl kôm모k} \quad ( < \text{mpanêkme ili pəl kômモk}) \]

I will take the pot to the person

3.3.3. More details on Tone Shift: Tone Reappearance sub-Rules

While the lowering of the non-prepausal final high or rising tone is general, its (re)appearance on the following word is only found in a subset of contexts. The high tone will reappear on the initial mora of a following word that is (underlyingly) all-low, irrespective of its length. Examples of this were given above. However, in certain cases in which the following word contains a (underlying) high or falling
tone, the high tone will not reappear. It will also not reappear if the following word contains a rising tone.

The circumstances will be specified in four Tone Reappearance sub-Rules.

sub-Rule 1: When the following mora is already high, there is no change to this word. In the examples below, па́ра́ has a final high tone, тóк ‘dog’ and пускон ‘barren woman’ have a final rising tone in isolation. The nouns вёк ‘leg’ and кálам ‘pen’ have an initial high tone in isolation.

\[
\begin{align*}
\text{мпе́чет па́ра вёк} & \quad \text{‘I will give the Tira person the leg’} \\
\text{мпе́чет тóк вёк} & \quad \text{‘I will give the dog the leg’} \\
\text{мпе́чет па́ра кálам} & \quad \text{‘I will give the Tira person the pen’} \\
\text{мпе́чет пускон кálам} & \quad \text{‘I will give the barren woman the pen’}
\end{align*}
\]

sub-Rule 2: When the following word has an initial mora with a low tone, immediately followed by a vowel with a high tone or falling tone, it remains the same. The nouns in the examples have, in isolation, the following tones:

па́ра́ ‘Tira person’, пускон ‘barren woman’, имвит ‘goat’ and апэ́ ‘fish’

\[
\begin{align*}
\text{мпе́чет па́ра имит} & \quad \text{‘I will give the Tira person the goat’} \\
\text{мпе́чет пускон имит} & \quad \text{‘I will give the barren woman the goat’} \\
\text{мпе́чет па́ра апэ́} & \quad \text{‘I will give the Tira person the fish’} \\
\text{мпе́чет пускон апэ́} & \quad \text{‘I will give the barren woman the fish’}
\end{align*}
\]

sub-Rule 3: When the following word has a final or last vowel with a rising tone, this word remains the same, irrespective of the number of low-toned vowels in the word. The nouns in the examples have, in isolation, the following tones:

mpeṭet pəra ʃok  ‘I will give the Tira person the dog’
mpeṭet pucəŋ ʃok  ‘I will give the barren woman the dog’
mpeṭet pəra kəriṭṭāṇ  ‘I will give the Tira person the knife’
mpeṭet pucəŋ kəriṭṭāṇ  ‘I will give the barren woman the knife’
mpeṭet pəra tennəkkettā  ‘I will give the Tira person the test’
mpeṭet pucəŋ tennəkkettā  ‘I will give the barren woman the test’

sub-Rule 4: When the following word starts in a number of vowels with a low tone and has a high tone or falling tone later on in the word, it depends on the word whether or not the first low becomes high (i.e. becomes a falling tone, after which the contour is simplified to high). In some words, the first mora becomes high when there is only one low mora separating it from the high or falling tone of the word itself, in other words, there must be two low morae in between.

All examples below are given with pəra ‘Tira person’, but could also be given with a noun with a rising tone such as pucəŋ ‘barren woman’. The second nouns are, in isolation, tουλί ‘hyena’, ɲʊmpəroŋ ‘calf (in sucking stage)’ and takərōk ‘chicken’, all of which have 3 morae (a final high tone preceded by two low morae). Note that in the example with takərōk ‘chicken’, the first mora does not become high.

mpeṭet pəra tουλί  ‘I will give the Tira person the hyena’
mpeṭet pəra ɲʊmpəroŋ  ‘I will give the Tira person the calf’
mpeṭet pəra takərōk  ‘I will give the Tira person the chicken’

Examples with purope ‘bird’, ɲatərapə ‘rabbit’ and aləmōntu ‘gun’ follow here. In the example with purope ‘bird’, the first mora does not become high.

mpeṭet pəra purope  ‘I will give the Tira person the bird’
mpeṭet pəra ɲatərapə  ‘I will give the Tira person the rabbit’
mpeṭet pəra aləmōntu  ‘I will give the Tira person the gun’
There are a few exceptions to these rules. In the first place, counter to sub-Rule 2, `cittín` ‘bird (sp.)’ changes its initial tone into a falling contour.

`mpetet pəra cittín` ‘I will give the Tira person the `cittm`-bird’

As this also runs counter to Contour Simplification, one may assume that the underlying form of `cittín` is `cittín` with a long vowel. However, in this lexeme, the vowel is always pronounced short.

Another case running counter to sub-Rule 2 (but not to Contour Simplification) is `parák` ‘fly’, the initial low tone of which becomes high:

`mpetet pəra párák` ‘I will give the Tira person the fly’

The examples above involve nouns with a final high or rising tone. Examples with words with a floating high tone give precisely the same results, for example:

`m-p-a.káta`  `ŋómpærúŋ`
1-c-look:INCOMPL  calf
I will look at/after the calf

`mpakóta tóulí` ‘I will look at/after the hyena’
`mpakóta tákørók` ‘I will look at/after the chicken’
`mpakóta puŗupɛ` ‘I will look at/after the bird’

This includes the exceptions to the rules, such as:

`mpakóta cittín` ‘I will look at/after the `cittm`-bird’

When the sentences are further extended, final high, rising and falling tones undergo the same phonological development. Compare:

`m-p-eṭet`  `pəra`  `wék`
1-c-give:INCOMPL  Tira.person leg
I will give the Tira person the leg
I will give the Tira person the leg of the chicken

Repeated application of Tone Shift goes from left to right: first the final high tone of ɲəŋ is lowered and will not reappear on wek because that word has an (initial) high tone itself. Then the high tone of wek is lowered and realized as a falling tone on the connexive element w-ɔ-, after which the contour is simplified to a high tone.

3.4. Deviations from the tone rules

There are more tone changes that do not follow from the tone rules established above. Those that seem to be specific to certain morphological and morphosyntactic constellations will be treated in the respective chapters on morphology. Morphemes/words with specific tonal effects include the non-personal proclitic subject pronouns and the 3rd person singular and plural (3 and 3A) proclitic subject pronouns (chapter 6.2), four out of five prepositional proclitics (chapter 16.1), the 1st and 2nd person singular possessor (chapter 7.3.1) pronouns and the vague reference particle cɪk (chapter 15-2). Conjunctions display tonal properties that do not fully comply with the tone rules (chapter 18).

In general, in situations of vowel coalescence and shortening of an underlyingly long vowel, (non-prepausal) low + high, or high + low tone combinations can be simplified to a high tone; some examples of this with the conjunctive particle á- and the subjunctive particle â- are presented in chapter 18.2. Examples of this simplification can also be found in 7.1.1 on the connexive. The falling tone of the irrealis morpheme (â), on the other hand, cannot be simplified to a high tone in case of coalescence and shortening (chapter 12.8).

The deviating tonal behaviour of certain verb forms with a final falling contour is described here.
3.4.1. Deviation from Contour Simplification: lowering of a final falling tone

Against the expectation raised by Contour Simplification, namely that the high part of a falling contour always remains in place, there are falling tones in word-final position that are, in certain contexts, realized as low, not as high. One such example are the tense-aspect-mood forms (TAMs) of verbs of tone class IIb (i.e. of verbs with a final falling contour) which have a final falling contour, notably the Dependent Incompletive (the stem form itself) and the Incompletive (see chapter 12 for the tone patterns of verbal stems and verbal TAMs).

Examples follow here with the stems of the tone class IIb-verbs ɔkkɔt ‘do, make’ and ɔcɔ ‘string’. When these verbs are followed by an all-low noun such as lɔn ‘words, matters’, their falling tone becomes high, as expected according to Contour Simplification:

ɔkkɔt lɔn  ‘to do things’
ɔcɔ lɔn  ‘to string things’

When the underlying falling tone is followed by an element with an initial high or falling tone or by an element with a high or falling tone on its second mora, the falling contour becomes low:

ɔkkɔt lù  ‘to make steam’  lù ‘steam’
ɔcɔ mɛn  ‘to string palm fruits’  mɛn ‘palm fruits’
ɔkkɔt kɔrɛt  ‘to make a cloth’  kɔrɛt ‘cloth’
ɔkkɔt cuccɔ  ‘to make a necklace’  cuccɔ ‘necklace’
ɔcɔ mɔrɔtɔ  ‘to string goatskin bracelets’  mɔrɔtɔ ‘goatskin bracelets’

If the following element has a high or falling tone on its third mora, the falling tone can become high or low. It becomes high here:

ɔkkɔt kappɔrɪ  ‘to make a spoon’  kappɔrɪ ‘spoon’
ɔkkɔt ɲaṭtɔkɔl  ‘to make a gourd’  ɲaṭtɔkɔl ‘gourd (k.o.)’

In the following example, neɔ becomes low:
In case of a following word with a final rising contour, there are two options for the realization of the verb: the falling tone may become high or low. Recall that the utterances without a high tone realized on the verb, are entirely pronounced at a slightly raised pitch, i.e., the whole stretch is pronounced according to the phonetic realization of the final rising tone.

To make a fire / to make a bracelet

These phrases allow for a third tonal realization: after a final high tone on the verb, the noun can be realized as all-low (see 3.2.2).

In case of a following underlyingly low + high word which is itself followed by another word so that the final high is realized as low, the verbal contour may be realized as high but also as low. The contour thus shows the same behaviour here as when it is followed by a word with a rising tone. Examples of this were the earlier given sentences with the verb mpɛtɛt ‘I will give’ followed by pəɾa ‘Tira person’ and an object noun. Though only one tonal realization was presented in the earlier given examples (the one deviating from Contour Simplification), there are actually two possibilities:

I will give the Tira person the leg

The lowering of a falling tone that is found with verb forms with a final falling contour of tone class IIb does not occur in comparable tonal constellations involving two adjacent nouns. An earlier given example for Contour Simplification is repeated here. The contour of mpɛtɛt ‘I will give’ is lowered before the contour or kallâ ‘old woman’ (which is realized as a high tone), but the contour of kallâ is not lowered before the contour of cɛn ‘palm fruit’.
mpeṭet kollán cën 'I will give the old woman the palm fruit'

Lowering of a falling contour does not occur in verbs from other tone classes. The examples below have the Completive form mpimmát of the verb imma ‘see’ of tone class I (see chapter 12.4.2 for the tone classes). The verb is followed by the nouns lú ‘steam’, mén ‘palm fruits’ and kərèt ‘cloth’. The contour is simplified, leaving its high part in place, in accordance with tone Contour Simplification:

mpimmát lú ‘I saw the steam’
mpimmát mén ‘I saw the palm fruits’
mpimmát kərèt ‘I saw the cloth’

Lowering of a final falling contour is, however, found in constructions with the Present of the verb ɔkā ‘be’, c-aīk (containing the formative ik (< cik)). Compare the following examples with the noun kwok ‘shoe’. In the fourth case, the prepositional proclitic ɪ- ‘in’ causes the contour to lower (see also 16.1).

kwok kaïk ‘the shoe is present; there is a shoe’
kwok kaïk karata ‘where is the shoe?’
kwok kaïk nə-wék ‘the shoe is on the foot’
kwok kaïk ɪ-wék ‘the shoe is on the foot’

There are some other cases in which, against the expectation raised by Contour Simplification, word-final falling tones are realized as low in non-prepausal position, instead of as high. These include the 3rd person singular and plural (3 and 3A) personal subject pronouns if preceded by the clitic subjunctive particle ā-: ā- + ɔk > ǎk and ā- + ɔkîn > ǎkîn.

3.5. Tone bridge

In certain contexts, a stretch of low tones becomes high between an underlyingly falling or a non-final high tone and a later falling or non-final high tone, cf.
The old woman will eat it.

The bird (sp.) will eat it.

The old woman will look.

The bird (sp.) will look.

Tone bridge occurs less commonly before a final high tone. In the following case there is tone bridge between the underlyingly falling tone on c-ɔ- ‘of’ (received from caɾi ‘day’ and simplified to a high tone) and kɨt ‘eye’. The derivation between parentheses is given under the gloss line.

caɾi  c-ʃ-r-ʃ-kɨt
 day  c-of-up.on-eyes
 (< caɾi c- t- kɨt < caɾi c- t- kɨt < caɾi c- t- kɨt)
the first day

A rising tone cannot function as the end of tone bridge:

kəpa  k-ʃ-ŋ-ʃɨk / k-ʃ-ŋ-ʃɨk
meat  c-of-on-fire / c-of-on-fire
(< kəpa k- n- ɨk < kəpá k- n- ɨk)
boiled meat (lit.: meat of on the fire)

kəpa  k-ʃ-waʃ / k-ʃ-waʃ
meat  c-of-cow
(< kəpa k- waʃ < kəpá k- waʃ)
the meat of a cow
There can be no tone bridge between two high/falling tones that occur in the same root. This is irrespective of whether both high/falling tones underlyingly belong to that root or one high tone (the initial one) comes from a preceding element. The latter is the case in the second example below: the high tone on ‘rabbit’ comes from ɲəʈá ‘Tira person’. Thus, the mora between the high tones in ‘lizard (sp.)’ cannot become high since they both belong to the root, nor can there be tone bridge on ‘rabbit’:

\[\text{kapəʈənt̪ʊŋ} \quad \text{‘lizard (sp.)’}\]
\[\text{mpeʈɛt/mpeʈɛt} \ ɲəʈəɾəpɛ \quad \text{‘I will give the Tira person the rabbit’}\]

There can, however, be tone bridge when one of the high/falling tones occurs on a clitic or affix. Question words with the suffix -tə allow for tone bridge. In the example below, karəʈá has received a high tone on its initial mora from ɲ- ‘with, by, (away) from’ and there is tone bridge:

\[\text{ɕ-kɪn} \quad ʈ-aa.t \quad ɲ.ɲin \quad ɲ-kárő-tâ}\]
\[\text{PERS-3A} \quad \text{come:COMPL} \quad \text{with:ABS} \quad \text{with:where-QW}\]
\[(< \ ɲkárəʈá < ɲkárəʈá < ɲ- karəʈá)\]
from where did they come with it?

Tone bridge applies after the other tone rules. In certain constellations it is obligatory, in others optional, in again others impossible. The following cases suggest that, at least in some environments, the number of low morae between two high/falling tones plays a role. In the first example, tone bridge is obligatory, in the second it is impossible.

\[\text{ŋkwɔnɔ pâpɛ-ı} \quad (< \ ŋkwɔnɔ pâpɛ -ı) \quad \text{‘do you have a fish?’}\]
\[\text{ŋkwɔnɔ pʊɾʊpɛ-ı} \quad (< \ ŋkwɔnɔ pʊɾʊpɛ -ı) \quad \text{‘do you have a bird?’}\]

The exact conditions under which tone bridge must, can or cannot be applied have not been fully clarified.
In the following, two common situations of tone bridge are studied, first tone bridge between a subject and an Incompletive verb; second in connexive constructions.

Tone bridge between subject nouns and verbs

A standard situation of tone bridge is found when a subject noun which itself has a final falling contour is followed by an Incompletive verb with a high tone on a non-initial vowel, as in the earlier mentioned examples:

[kəlłán k-áʔokó] (kəlłán kərəkə)  
old_woman c-eat:INCOMPL  
the old woman will eat

[kəlłán k-á.kóta] (kəlłán kəkəta)  
old_woman c-look:INCOMPL  
the old woman will look

The possibility of tone bridge depends on the aspectual form of the verb. There is no tone bridge when the verb is a Completive with a final falling contour (first example below) or a Past with a non-final high tone (second example below), nor when it is a Completive with a final high tone (third example below).

[kəlłán k-əkətā.t] (kəlłán kəkətāt)  
old_woman c-look:COMPL  
the old woman has looked

[kəlłán k-əkətá.kate] (kəlłán kəkətákatə)  
old_woman c-look:PST  
the old woman looked

[kəlłán k-əɾəkort] (kəlłán kəɾəkort)  
old_woman c-eaten:COMPL  
the old woman has eaten it

Tone bridge does, however, occur between a subject with a final falling contour and a Completive verb with a final falling contour.
preceded by the ‘restrictor’ (see chapter 9). The high tone of the restrictor cannot reappear on the Completive verb kɔkətāt.

kɔllān  ɪ-k-ʃkətā.t
old_woman  RES-C-look:COMPL
(< kɔllān kokaṭāt < kɔllān ɪ- kokaṭāt < kɔllān ɪ- kokaṭāt)
the old woman who has looked

Verb forms of tone class IIb and tone bridge

As discussed earlier, a non-prepausal final contour of verb forms of tone class IIb will be realized as high in certain circumstances and as low in others. It is realized as low in the first example, and as high in the second and third. There is tone bridge between the subject and the verb in the third example. Notably, verbs with an (underlying) final falling tone do not have a floating high tone.

m-p-a.ɾako  ṭʊɾɪt  (< mpaɾəkɔ ṭʊɾɪt)
1-c-eat:INCOMPL  food
I will eat the food

m-p-a.ɾakó  pacikkɔt  (< mpaɾəkɔ pacikkɔt)
1-c-eat:INCOMPL  mashed_groundnut_dish
I will eat pacikkɔt

kɔllān  k-á.ɾako  pacikkɔt
old_woman  C-eat:INCOMPL  mashed_groundnut_dish
(< kɔllān kaɾako pacikkɔt < kɔllān kaɾako pacikkɔt < kɔllān kaɾako pacikkɔt)
The old woman will eat pacikkɔt

In the example below, where the verb has become all-low because of the process described under 3.4.1, tone bridge spans from the subject noun all the way to the object noun:

kɔllān  k-á.ɾako  ṭʊɾɪt
old_woman  C-eat:INCOMPL  food
(< kɔllān kaɾako ṭʊɾɪt < kɔllān kaɾako ṭʊɾɪt < kɔllān kaɾako ṭʊɾɪt)
The old woman will eat the food
This works also when the noun at the end has a final high tone:

kəllán k-á.róbó kópá
old_woman c-eat:INCOMPL meat
(< kəllán k-arákó kópá < kəllán k-arákó kópá < kəllán k-arákó kópá)
the old woman will eat the meat

Tone bridge can even extend further, as will be exemplified using the expression caří cíaťâ ‘on which day’. In the first example below, the final high tone of kópá ‘meat’ has become low, without causing a high tone on the following word because of Tone Reappearance sub-Rule 2 (the next word has itself a rising tone). As a result a long stretch of low tones appears. Note in the tonal derivation presented between parentheses, that in caří cíaťâ the final rising tone of caří ‘day’ has become low, and caused the heightening of the initial vowel of cíaťâ ‘which’, after which the two high tones formed a tone bridge: cíaťâ. The second example, with a low-toned subject is given for comparison.

kəllán k-á.róbó kópá caří c-ía-tâ
old_woman c-eat:INCOMPL meat day c-which-QW
(< kəllán k-arákó kapa caří cíaťâ < kəllán k-arákó kapa caří cíaťâ <, kəllán k-arákó kapa caří cíaťâ <, kəllán k-arákó kapa caří cíaťâ <, kəllán k-arákó kapa caří cíaťâ < kəllán k-arákó kopa caří cíaťâ)
on which day will the old woman eat meat?

ukul w-a.țókó kópá caří c-ía-tâ
child c-eat:INCOMPL meat day c-which-QW
(< ukul w-țókó kapa caří cíaťâ < ukul w-țókó kapa caří cíaťâ < ukul w-țókó kapa caří cíaťâ < ukul w-țókó kópá caří cíaťâ)
on which day will the child eat meat?

The next case is given for comparison as well. The verb is not lowered before mait ‘beans’, so that there is no uninterrupted stretch of low tones between kəllán and cíaťâ. There is tone bridge, but not all the way to the question word.
kəllán k-á.rákó mait caři c-íá-tâ
old_woman c-eat:INCOMPL beans day c-which-QW
(< kəllán ká.rákó mait caří cíá-tâ < kəllán kərákó mait caří cíá-tâ < kəllán kərákó
mait caří cíá-tâ)
on which day will the old woman eat beans?

In the examples above with tone bridge spanning over the verb, the verbs have lowered before they are bridged. The (underlying) final falling tone of a verb of tone class IIb can also function as the left boundary of a tone bridge, as in the next example:

tʊra-tʊra t-có.r-ín ź-unú
insect(sp.)-REDUP c-go:COMPL-01 at-ears
(< tʊr-ɨn ź-unů < tɛr-ɨn ź-unů < tɛʃ t-ɨn ź- unů)
a tʊra-tʊra-insect went into my ear (lit.: went me at the ears)

**Tone bridge in connexive constructions**

In constructions with the connexive marker c-ɔ- ‘of’, tone bridge is applied when c-ɔ- has a high tone (always because of Tone Shift followed by Contour Simplification), while the following noun (the possessor) has a final falling contour or a non-final high tone.

kəpa k-ʃ-kɔllând
meat c-of-old_woman
(< kəpa k-ʃ-kɔllán < kəpa k-ʃ-kɔllán < kəpá k-ɔ- kəllán)
the meat of the old woman

kɪt k-ʃ-cǔllúkkur
eyes c-of-bird(sp.)
(< kit k-ʃ-cǔllúkkur < kit k-ʃ-cǔllúkkur < kɪt k-ɔ- cǔllúkkur)
the eyes of the bird (sp.)

Tone bridge does not apply when the possessor noun has a final high tone, e.g.,
kəpa  k-ʃ-ɪmɪt  ( < kəpa kʃ-imɪt < kəpá k- ḳɪmɪt)
meat       c-of-goat

the meat of the goat

In a construction where the connexive marker does not become underlyingly falling because it is preceded by a noun with an (underlying) final falling contour, there is no tone bridge between this underlying contour of the possessed noun and a final falling tone of the possessor noun:

_tCʊ́rɪ́t   ʈ-ɕ-kəlɭən  ( < ḳʊ́rɪ́t ʈ-ɕ-kəlɭən)
food     c-of-old_woman

the food of the old woman

ćʊɽɛ  c-ọ-ɪ́tʊ́n  ( < ćʊɽɛ c-ọ-ɪ́tʊ́n)
bulb       c-of-onion

the bulb of the onion

Cf. also the following examples. In the first case below, the connexive has not become underlyingly falling either, but is preceded by an all-low noun which is itself preceded by a verb with (underlyingly) a final falling contour. There is tone bridge spanning over the low noun and the connexive particle to the noun with final falling contour:

m-p-ɔnú  ʈiák   ʈ-ʃ-ʊŋʊ́ (< mponú ʈiak ʈ-ŋʊ́)
1-c-have  appetite       c-of-asida

I long for asida

There is, however, no tone bridge when the final noun has a high tone:

m-p-ɔnú  ʈiak   ʈ-ɕ-kəpá   ( < mpʊnú ʈiak ʈ-ɕ-kəpá)
1-c-have  appetite       c-of-meat

I long for meat
There is also no tone bridge in the following case, in which the connexive has become high but is followed by a verbal noun with an underlying rising tone:

\[
\text{kûrek k-ş-t-ora mîl}
\]

\(< \text{kûrek k-ş- trà mîl} < \text{kûrek k-ş- trà mîl} < \text{kûrek k-ş- trà mîl})
\]

a hoe for cultivating sorghum

The precise circumstances under which connexive constructions in larger contexts undergo, or do not undergo, tone bridge have not been clarified.

Optional tone bridge

In some contexts tone bridge is optional. Some examples follow here. Note that it concerns verbs with an underlyingly falling contour followed by more than one element: tone bridge spans from the high tone of the verb to the high tone of the second following element.

\[
\text{pol p-ôkkîntét úkol kúrrôŋ}
\]

\[
\text{pol p-ôkkîntét úkol kúrrôŋ}
\]

person C-do_for:COMPL child stick

the man has made a stick for the child

\[
\text{ɔ-nnán p-ónek.âté úkol a-kw-ǐce.kat cik ná-ǎraŋkál}
\]

\[
\text{ɔ-nnán p-ónek.âté úkol a-kw-ǐce.kat cik ná-ǎraŋkál}
\]

PERS-mother C-take:PST child CONJ-3-lay_down:DEPPRFV VREF on-bed

the mother picked up the child and laid it down on the bed

In the following sentence there is obligatory tone bridge between the high tone of paparšt (underlyingly papařšt) and the falling contour of papottě (realized as pápottě), which is a contraction of papaště. Tone bridge between Krishna (underlyingly Krishna) and paparšt is optional. The more common variant in connected speech is with tone bridge.
I hope you feel a little better?

When \texttt{păpott{	extae}} is omitted and \texttt{p\textipa{pərőt}} is in prepausal position, there cannot be tone bridge between \texttt{ŋkw\textipa{t\textae}kkát} and \texttt{p\textipa{pərőt}}:

\texttt{att\textipa{i} \texttt{ŋ-kw\textipa{-t\textae}kká.t \textipa{p\textipa{pərőt}} \textipa{pá-p\textipa{-őttē}}}}

I hope you feel better?

In some cases, tone bridge is a marked intonation, used for covering distance across a valley (people typically communicate over large distances, from one mountain slope to another, shouting with a particular, far-reaching voice). The following phrase (for an example as an answer to ‘where are you going’, or ‘what is going on’ is an example:

\texttt{t\textipa{ipa} \textipa{t-\textipa{-k\textipa{o}kkó} \textipa{ɔ-k\textipa{n} \textipa{ɔ-kakká}}} \texttt{t\textipa{ipa} \textipa{t-\textipa{-k\textipa{o}kkó} ś-k\textipa{n} ś-k\textipa{kakká}}} \texttt{\textipa{(distance \textipa{covering})}}}

\texttt{\textipa{marriage \textipa{c-of-K\textipa{k\textipa{k}}u} \textipa{PERS-3\textipa{A} \textipa{PERS-K\textipa{k\textipa{k}}a}}} \texttt{the \textipa{marriage \textipa{of \textipa{K\textipa{k\textipa{k}}u and K\textipa{k\textipa{k}}a}}}}

3.6. Clause-final boundary tone with pragmatic function

In situations of clause chaining, a first clause can take a final high tone. This high tone is an intonational tone; it is independent from tonal properties of the clause-final element or its preceding element. It conveys that the sentence is not finished yet and creates an expectation that something interesting is going to follow in the next clause. It is typically followed by a small pause.

Clauses that start with the conjunction word \texttt{á\textipa{mma} + H ‘if, when’ or \texttt{ak\textipa{ka} + H ‘when, because’}, or a compound conjunction containing \texttt{á\textipa{mma} + H or \texttt{ak\textipa{ka} + H}, and that are followed by a clause starting with \texttt{ana + H ‘and’}, the conjunction particle \texttt{ā} or the subjunctive particle \texttt{â}, creating a construction such as ‘if/when ..., then ...’, ‘as soon as ..., x must ...’ often take the boundary tone.
In the following sentence the word mpántɔkòtak ‘I can see him’, which has a final low tone in isolation, has a final high tone and precedes a small pause. manákka ‘when, as soon as, even as’ is a compound conjunction of maná ‘even’ and akká ‘when, because’.

manákka m-p-aa.t t-ceik k-óŋ itti
when 1-c-come:COMPL near c-POS3 that
m-p-ánt-ɔkɔtá-k ana k-kw-ìrr.áte
1-c-come:COMPL-look at:DEPINCOMPL-03 and 3-c-jump:PST
when I had come near him so that I could see him, he jumped (written story)

In the next example with akka, there is a high tone on the 3SG object pronoun attached to the verb ‘turn’ that would otherwise not be there. This tone causes tone bridge over the entire verb. In isolation, the verb would be realized as kkwápəráttɔrɔk ‘s/he has turned him/her’.

akka k-kw-ápəráttɔ.r-ɔk
that 3-c-turn:COMPL-03
áccieka a-k-kw-óllókkwɔ.t
CONJ.(2.)hear:DEPPRFV CONJ-3-c-hir:COMPL
when he (the bird) turned him (to his other wing), you could hear that he (the tortoise) slipped (away) (App. IV, 126-127)

An example with an ámma +H clause and a clause-final high tone (on the anaphoric demonstrative cen, see 8.2) follows here. Note also that Contour Simplification was not applied to the word ‘rock’ (underlyingly cʊɾɔl). This may have to do with the ability of l (and also the nasals) to carry part of the preceding tone.

ámmá á-kkɔ nɔ-cʊɾɔl c-ɛn
if CONJ-(2)-reach:DEPINCOMPL on-rock c-DEM
ŋ-kw-át-ɔt cieka c-ɔkɔr̥iakɔ.t.c
2-c-IT:INCOMPL-find:DEPINCOMPL place c-be_squeezed:COMPL
á-ppɔ tут kaša kaʃɔr k-ɛn
SUBJ-(2)-pass:DEPINCOMPL in:ABS look:IMP road c-DEM
when you reach that rock, you will find a narrow space, you must pass there, look, it is that road (i.e. the road you need to take) (fr. written text)
The clause final high tone is not part of these constructions per se. In the previous example, ēn ‘that’ could also be realized with its own low tone. In the next sentence it is possible to realize āpɔ ‘fall’ with a final high tone (and a pause), but a low realization of āpɔ is actually somewhat more natural, since no expectation or “suspense” is involved. It is just a description of what happens under a certain circumstance:

ámmá á-kápik āpɔ a-kw-ikkɔ cik 1-kɔɾúk k-en
if CONJ-rain fail:DEPNCOMPL CONJ-3-sit:DEPNCOMPL VREF in-sheltered_spot C-OF:ABS
when the rain falls, he sits in its shelter (in the shelter of a wall) (App. I, 18)

Other clause chaining constructions can also have this high tone. The final high tone on póccɔk ‘for some time’ in the example below is such a tone:

a-kw-ɔcca.kat ɲurú ɪ-carək póccɔk
CONJ-3-scoop:DEPPRFV asida in-belly for_some_time

a-kw-ɔtɔka.kat a-kw-ɔme.kat ɪtti ...
CONJ-3-become_satisfied:DEPPRFV CONJ-3-say:DEPPRFV that
and he scooped the asida into his stomach for some time and he got satisfied and he said … (App. IV, 29-30)

To the same effect the underlying final Falling tone on the last mora of the first ákka clause in the example below is realized as high before a small pause (i.e. ɲurú instead of ɲurũ). In the second clause with ákkã there is again a final high tone on póccɔk

akka k-kw-ɔtɔka.t ɲurú
that 3-C-eat:COMPL asida

akka ɔ-kín t-ɔtɔka.t ɲurú póccɔk
that PERS-3A C-eat:COMPL asida for_some_time

a-kw-ɔme.kaɭ-ɔk ɪtti ...
CONJ-3-tell:DEPPRFV-O3 that
when he had been eating the asida, when they had been eating the asida for some time, he (the bird) said to him: … (App. IV, 24-26)
3.7. Intonation effects in isolated nouns

Intonation effects exist in isolated nouns. If, in answer to a question, a single noun is uttered with annoyance or impatience its tones may be realized slightly differently. An all-low noun may be realized at level pitch (without final downglide) and a final high tone may be realized at a somewhat lower pitch than usual.

There also seem to be intonation effects depending on whether an utterance is an 'out-of-the-blue' remark or provides information that was solicited (typically an answer to a question). In the example below, a final high tone suggests that the information was solicited, a final low tone that it is a thetic remark.

\( \text{ɲ-pan-k-í̄n} \quad \text{p-á-nín} \quad \text{t-á.fk} \quad \text{í̄n-áṭṭót / í̄n-áṭṭót} \)

\footnotesize{pers-sibling-c:poss1 \quad c:be:pers-1a \quad c:be:pr \quad 1a-with_person}

my brother is with me

3.8. Tonal properties and representation of affixes, clitics, conjunctions and cik

Affixal and clitic elements can cause the same tonal changes (or the same lack of change) to their environment as nouns and other words. As already exemplified in this chapter, there are also clitic elements that have tonal implications different from the general ones, such as the prepositional proclitics \( \text{i-, n̥-, t̪-} \), and \( \text{t̪} \) and the 3\textsuperscript{rd} person subject and non-human subject proclitics. It is difficult to give the citation form of such elements a satisfactory tonal representation. In some cases I have chosen not to represent tone on these items, though, unlike the orthography might suggest, these item do not behave as low-toned items, but do have tonal effects on their environment.

There are also affixes and clitics that seem to fit into the system set out by the tone rules, but nevertheless do not have an obvious tonal representation. This concerns prefixes and pro-clitics that bring a high tone to a next element, but being prefixal or pro-clitic, have no prepausal realization. It is precisely the prepausal realization of a
word that easily enables us to distinguish between a final high tone, a final rising tone, and a floating high tone.

Looking at other tonal properties of words with a final high tone, a final rising tone, or a floating high tone shows that the prepausal realization of these words is not their only difference. There is also a difference as to the capacity of words with these patterns to receive a high tone from a preceding element.

As can be seen from the examples given earlier in this chapter:

1. words with a rising tone cannot receive a high tone (unless through tone bridge), irrespective of their number of morae;
2. monomoraic words with a high tone cannot receive a high tone (unless through tone bridge), but longer words with a final high tone in principle can, even though many need a (lexically-determined) minimum space between their first mora (the potential receiver of a preceding high tone) and their own high tone;
3. words with a floating high tone can receive a high tone from a preceding element, though it is unclear if this also holds for monomoraic elements. Verbs, especially Dependent Incompletives and Dependent Perfectives of low-toned verbs, are the best model for this type of tone pattern since they have 1) a prepausal realization, 2) the floating high tone, 3) lack other tones that may influence their ability to receive a preceding tone. There are, however, no monomoraic verbs of this type. The only monomoraic verb is the copula (c-á), but the copula cannot occur in prepausal position, so that it is itself a ‘problem’ case with respect to its tonal representation. For the sake of distinguishing, and because it is certainly not unlikely, we will assume that, unlike monomoraic high and rising elements, a monomoraic element with floating high tone is able to receive a preceding high tone. This then excludes this tone pattern for the copula, since, unless through tone bridge, it cannot receive a high tone itself.

The tonal representation of a mono-moraic element without prepausal realization will thus be determined as follows:
1. Can it generate a high tone on a next element?
   No: low tone; yes: high tone, floating high tone or rising tone
2. Can it receive a high tone itself?
   No: rising or high tone; yes: low tone or floating high tone

This shows that for monomoraic items without prepausal realization and which are unable to receive a high tone, a choice between rising and high remains. In such cases I choose a representation as high, the advantage of which is perhaps that any suggestion of historical loss of a mora—which may be associated with a rising tone—is avoided. The persona prefix (ɔ́-), the restrictor (ɪ́-) and prepositional proclitic ŋ- ‘with, by, (away) from’ are therefore represented with a high tone (as is the Present of ‘be’ (c-á)).

Conjunctions pose problems in a comparable way: though they are words and can thus be realized alone, in context they are never prepausal so that their isolated tonal realization is not actually trustworthy. Their typical tonal behaviour is to bring a high tone to a next element, while they tend to be realized in isolation with a low tone. Moreover, in some cases their own tonal realizations in context can be rather unpredictable. Though problems remain, I propose a tonal representation for most conjunction words (see chapter 18).

Some of the suffixes and enclitics are less problematic as to tonal representation since they have a prepausal realization and behave regularly. Some of the personal object clitics, however, display irregular behaviour. I nevertheless propose a tonal representation, to avoid confusion with L-toned elements (see chapter 6.4).

The 1SG and 2SG possessor pronouns and the so-called vague reference particle cík display tonal properties that deviate from the tone rules. I represent the 1SG and 2SG possessor pronouns as having two tonal alternatives, apparently in free variation, while showing at the same time that some unexpected tonal behaviour remains (see chapter 7.3.1). The irregular behaviour of cík does not allow for assignment of an underlying tone. Though its notation may suggest otherwise, I do not regard it as an item with low tone (chapter 15.2).