A Phonological Sketch of Moghamo

a Narrow Grassfields Bantu Language

Jonas Tunviken

SIL
B.P. 1299, Yaoundé, Cameroon
2013
Language: Moghamo as spoken mainly in Batibo Subdivision, Momo Division of the North West Region, Republic of Cameroon.

ISO 639-3 language code: mgo

© 2013 SIL, done in collaboration with CABTAL
Table of Contents

Table of charts and figures ................................................................. 5
Abbreviations .................................................................................. 6
Acknowledgements .......................................................................... 7
1. Information on the language ....................................................... 8
   1.1 Previous research .................................................................. 8
2. Consonants .................................................................................. 9
   2.1 Consonant phoneme inventory ............................................. 9
      2.1.1 Plosives ......................................................................... 11
      2.1.2 Affricates ...................................................................... 14
      2.1.3 Fricatives ...................................................................... 14
      2.1.4 Nasals ........................................................................... 15
      2.1.5 Approximants ............................................................... 18
   2.2 Consonant modifications ....................................................... 19
      2.2.1 Labialized consonants .................................................. 19
      2.2.2 Palatalized consonants .................................................. 20
3. Vowels ....................................................................................... 21
   3.1 Vowel phoneme inventory .................................................... 21
      3.1.1 Front vowels .................................................................. 22
      3.1.2 Central vowels ................................................................ 23
      3.1.3 Back vowels .................................................................. 23
   3.2 Nasalized vowels ................................................................... 23
4. Syllable structure ......................................................................... 25
   4.1 Basic syllable types ............................................................... 25
   4.2 Modified syllable types ......................................................... 26
   4.3 Noun roots ............................................................................ 26
   4.4 Verb roots ............................................................................. 27
5. Phonotactics ................................................................. 28
  5.1 Distribution of consonants .............................................. 28
    5.1.1 Onset consonants .................................................. 28
    5.1.2 Coda consonants .................................................. 29
  5.2 Distribution of vowels ................................................... 29
    5.2.1 Closed syllables .................................................. 29
    5.2.2 Open syllables .................................................. 30
  5.3 Distribution of syllables ................................................ 30

6. Tone ........................................................................ 32
  6.1 Grammatical tone .......................................................... 32
  6.2 Lexical tone .................................................................. 32
    6.2.1 Level tone .................................................................. 34
    6.2.2 Contour tone .......................................................... 35
  6.3 Tone on nouns ............................................................... 36
    6.3.1 Tone on nominal prefixes ......................................... 36
    6.3.2 Tone on noun roots .................................................. 36
  6.4 Tone in multimorpheme lexemes .................................... 37
  6.5 Tone on verbs ............................................................... 38
    6.5.1 Tone on verb roots .................................................. 38
    6.5.2 Tone on verb stems .................................................. 39

7. Morphophonemics ........................................................... 40
  7.1 Epenthesis ................................................................. 40
  7.2 Elision ......................................................................... 40
  7.3 Coalescence ............................................................... 41
  7.4 Reduplication ............................................................. 41

Conclusion ......................................................................... 42
References .......................................................................... 43
<table>
<thead>
<tr>
<th>Chart</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart 1</td>
<td>Unmodified consonant phonemes</td>
<td>9</td>
</tr>
<tr>
<td>Chart 2</td>
<td>Labialized consonants</td>
<td>19</td>
</tr>
<tr>
<td>Chart 3</td>
<td>Vowel phonemes</td>
<td>21</td>
</tr>
<tr>
<td>Chart 4</td>
<td>Nasalized vowels</td>
<td>24</td>
</tr>
<tr>
<td>Chart 5</td>
<td>Tone melodies on nouns</td>
<td>37</td>
</tr>
<tr>
<td>Chart 6</td>
<td>Tone melodies on verbs</td>
<td>37</td>
</tr>
</tbody>
</table>

| Figure 1 | Contour tones                                     | 34   |
Abbreviations

~ free variation
- morpheme break
: lengthened vowel
. syllable break
/.../ phonemic form
[...] phonetic form
C consonant
D downstepped-high tone (á)
G glide
H high tone (á)
HL high-low tone (å)
IMPF imperfective aspect
L low tone (à)
LF low-falling tone (ã)
LH low-high tone (ã)
LM low-mid tone (ã)
M mid tone (ã)
ML mid-low tone (ã)
N nasal consonant
n noun
PROG progressive aspect
STAT verbal stative
V vowel
v verb
vd voiced
vl voiceless
Acknowledgements

Several persons from the Moghamo language committee (MOLCOM) have contributed to the accomplishment of this paper. They are:

Mr Mathaus Njeck Mbah, co-ordinator of the language committee;

Mr Mbah Martin, vice chairman;

Mrs Akoh Rosemary, member;

Mrs Tunviken Lizette, secretary;

Mr Mbah Henry, member;

Mrs Atud Justine, member;

Mr Tebong Robert, inspector of pedagogy;

Mr Tanjoh Christopher Fon, Bible translation student.

Acknowledgements also go to Dr. Robert Hedinger, whose comments and suggestions improved this analysis.
1. Information on the language

Moghamo is a Narrow Grassfields Bantu language spoken by about 75,000 people (Njeck 2008: 1) in Batibo Subdivision, Momo Division of the North West Region of Cameroon. Moghamo speakers are also found in the village Ngyiembo of Mbengwi Subdivision of Momo Division, in some villages of Santa Subdivision (i.e., Baforchu, Baba II and Mbe) Mezam Division and in Banjah village also in Mezam Division of the North West Region.

According to Dieu & Renaud (1983), Moghamo is a Cameroonian national language belonging to zone 8 with the number 866. It has four different speech forms (Aywi, which is spoken in for example Batibo, also Iyirikum, Ashong and Kugwe). This work is based on the Aywi speech form, which is the reference dialect.

The Ethnologue (Lewis 2009) still lists Moghamo and Meta’ as dialects of the same language, ISO 639-3 language code: mgo with the following classification: Niger-Congo, Atlantic-Congo, Volta-Congo, Benue-Congo, Bantoid, Southern, Wide Grassfields, Narrow Grassfields, Momo.

1.1 Previous research

For this study a database of 2,080 Moghamo words has been used based mainly on the SIL comparative African wordlist collected by Mathaus Njeck, as well as the Moghamo Orthography guide (Njeck 2008). A document frequently referred to in this study is an article by Roderic F. Casali (1995) ‘NCs in Moghamo: Prenasalized Onsets or Heterosyllabic Clusters?’ Studies in African Linguistics. 24:2, 151-65, in which the author analysis mainly the nasal-consonant combinations in Moghamo.
2. Consonants

2.1 Consonant Phoneme Inventory

Moghamo has 18 unmodified consonant phonemes\(^1\). They are listed in Chart 1:

*Chart 1. Unmodified Consonant phonemes*

<table>
<thead>
<tr>
<th>Phoneme</th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Alveolar</th>
<th>Post Alveolar</th>
<th>Palatal</th>
<th>Velar</th>
<th>Labial Velar</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosives</td>
<td>vl</td>
<td>vd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>b</td>
<td>t</td>
<td>d</td>
<td>k</td>
<td>g</td>
<td></td>
<td>[ʔ]</td>
</tr>
<tr>
<td>Affricates</td>
<td>vl</td>
<td>vd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f</td>
<td>s</td>
<td>z(^2)</td>
<td></td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>m</td>
<td>n</td>
<td>j</td>
<td></td>
<td>w</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximants</td>
<td>vl</td>
<td>vd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The different consonant phonemes are shown in the following pair of contrasts in the similar environment:

- /p/ and /b/: 
  - [nî.pê] to arrive
  - [nî.bê] to be first

- /t/ and /d/: 
  - [î.tûm] short one
  - [î.dûm] heap

---

\(^1\) Casali (1995: 153) also lists 18 phonemes, including [ʔ]. Also, he has /ɣ/ as an allophone of /g/ and not as a phoneme.

\(^2\) The alveolar sounds [s] and [z] are in free variation with the post alveolar sounds [ʃ] and [ʒ].
<table>
<thead>
<tr>
<th>/k/ and /g/</th>
<th>[kóm]</th>
<th>medicinal stick</th>
</tr>
</thead>
<tbody>
<tr>
<td>[góm]</td>
<td>blood omitted after childbirth</td>
<td></td>
</tr>
<tr>
<td>/tʃ/ and /dʒ/</td>
<td>[í.tʃí]</td>
<td>rainy season</td>
</tr>
<tr>
<td>[í.dʒí]</td>
<td>thief</td>
<td></td>
</tr>
<tr>
<td>/s/ and /z/</td>
<td>[í.só̞g]</td>
<td>world</td>
</tr>
<tr>
<td>[í.zó̞g]</td>
<td>witchcraft</td>
<td></td>
</tr>
<tr>
<td>/ʃ/ and /ʒ/</td>
<td>[ní.ʃé.ʃí]</td>
<td>to gather</td>
</tr>
<tr>
<td>[ní.ʃé.ʃí]</td>
<td>to slice</td>
<td></td>
</tr>
<tr>
<td>/g/ and /ɣ/</td>
<td>[ní.ɣúm.ɲí]</td>
<td>to bend</td>
</tr>
<tr>
<td>[ní.ɣúm.ɲí]</td>
<td>to honour</td>
<td></td>
</tr>
<tr>
<td>/m/ and /n/</td>
<td>[ní.mɔ̞ʔ]</td>
<td>to throw</td>
</tr>
<tr>
<td>[ní.nɔ̞ʔ]</td>
<td>to give</td>
<td></td>
</tr>
<tr>
<td>/ɲ/ and /ŋ/</td>
<td>[ní.ɲím.ɲí]</td>
<td>to get lost</td>
</tr>
<tr>
<td>[ní.ɲím.ɲí]</td>
<td>to be tight</td>
<td></td>
</tr>
<tr>
<td>/n/ and /ɲ/</td>
<td>[ní.ɲɔ̞m]</td>
<td>to mix</td>
</tr>
<tr>
<td>[ní.ɲɔ̞m]</td>
<td>to lift something heavy</td>
<td></td>
</tr>
<tr>
<td>/ɣ/ and /w/</td>
<td>[í.ɣꜰɲ]</td>
<td>roots</td>
</tr>
<tr>
<td>[í.ɣꜰɲ]</td>
<td>line</td>
<td></td>
</tr>
</tbody>
</table>
2.1.1 Plosives

There are six plosive phonemes in Moghamo: /p/, /b/, /t/, /d/, /k/ and /ɡ/. Only the voiced plosive phonemes, that is /b/, /d/ and /ɡ/ can occur in word final position and are then unreleased or released:

\[ \text{[fɪ.pʊb]} \sim \text{[fɪ.pʊb]} \quad \text{\textit{k.o. rat}} \]
\[ \text{[nɪ.fɪd]} \sim \text{[nɪ.fɪd]} \quad \text{\textit{to steer}} \]
\[ \text{[tʃʊɡ]} \sim \text{[tʃʊɡ]} \quad \text{\textit{raffia palm}} \]

\textit{Bilabial plosive}

The bilabial voiceless plosive /p/ occurs root initially:

/ɪ-pʊ.mɪ/ \quad \text{\textit{salvation}}

/pəb/ \quad \text{\textit{enmity}}

When a word root has a nasal-consonant combination, the consonant has to be voiced. The /p/ phoneme is then realised as the [b] sound, as in the following example which first gives the word from which it is derived. Note that the prenasal is toneless. In the case there is no preceding tone, the nasal is associated with a low tone\(^3\), which lowers the following tone.

/ŋi-pək/ \rightarrow [nɪ-pəʔ] \quad \text{\textit{to press}}

/ŋpək/ \rightarrow [ʰbəʔ] \quad \text{\textit{button}}

The bilabial voiced plosive /b/ occurs root initially, root medially and root finally. Root initially:

/ŋi-bi.dɪ/ \quad \text{\textit{to weed}}

/b5.ŋɔ/ \quad \text{\textit{before}}

\(^3\) See more about prenasals associated with low tone in section 2.1.4 and 4.1.
/à-bà.tʃò.ŋɔ̃/  

* south

Root medially and between vowels /b/ can be realized as the bilabial fricative sound [β]:

/χɔ̃.bà/  →  [kɔ̃.bà]  ~  [kɔ̃.βà]  

* cloth worn by women

Root finally:

/mí.níb/  

* water

**Alveolar plosive**

The alveolar voiceless plosive /t/ occurs root initially:

/tɔ/  

* five

/t̪̥-tɔd/  

* mad man

/tɪ-tɛ/  

* throwing stick

/tɔŋ/  

* count!

The /t/ phoneme is realised as the [d] sound in a nasal-consonant combination, as in the following example which first gives the word from which it is derived:

/í-tɔ.ɗi/  →  [í-tɔ.ɾi]  

* cramp

/ní-Ntɔ.ɗi/  →  [ní-ɗṭ.ɾi]  

* to be slow

The alveolar voiced plosive /d/ occurs root initially, root medially and root finally. Root initially:

/à-dɔ.ŋò-ɗɔ.ɲɛ/  

* praying mantis

Root medially and between vowels /d/ is realized as the trill sound [ɾ]:

/mɔ.ká.ɗá/  →  [mɔ.ká.ɾá]  

* European people

Root finally:
The velar voiceless plosive /k/ occurs root initially:

\[/ní-kō/\]

\[/á-ká.pí/\]

\[[fí-kä.ʔi.ⁿ bäñ]\]

\[[tí-kōʔ]\]

\[\text{to advise}\]

\[\text{shell}\]

\[\text{rib}\]

\[\text{chopping board}\]

There is no well attested case where the /k/ phoneme is realised as the [g] sound in a nasal-consonant combination. It is uncertain whether the two words in the following example show any derivational relationship:

\[/ní-kōn/\]

\[/Nkōn/ \rightarrow [ⁿgõn]\]

\[\text{store house}\]

The velar voiced plosive /g/ occurs root initially, root medially and root finally. Root initially:

\[/gùm.á.ɣòg/\]

\[/i-gôn/\]

\[\text{thigh}\]

\[\text{over}\]

Root medially and between vowels /g/ is realized as the velar fricative sound [ɣ]:

\[/bá.ɣí/ \rightarrow [bá.ɣí]\]

\[\text{red}\]

Root finally:

\[/tʃãg/\]

\[\text{raffia palm}\]

Glottal plosive

The glottal plosive [ʔ] is in complementary distribution with [k] in that it occurs root finally and medially:
[ní.tʃəʔ] to guide
[fí.kɔʔ]  ladder
[ɗá.kúʔí] tailbone

2.1.2 Affricates

There are two affricates in Moghamo: /tʃ/ and /dʒ/.

The palatal voiceless affricate /tʃ/ occurs root initially:

/ní-tʃəb/ to pinch

The palatal voiced affricate /dʒ/ occurs root initially:

/ní-dʒəg/ to eat

2.1.3 Fricatives

There are four fricatives in Moghamo: /f/, /s/, /z/ and /ɣ/.

Labiodental fricative

The labiodental voiceless fricative /f/ occurs root initially:

/ní-fé/ to lock

Alveolar fricative

The alveolar voiceless fricative /s/ occurs root initially and root medially. Root initially:

/səɡ/ soil

Root medially it occurs only in loan words:

/ɑ.trə.ʃɔ/ trousers
/pʊ.sí/ cat
A free variant of this phoneme is the sound [ʃ]:

\[
\text{[ʃú]} \sim \text{[ʃú]} \quad \text{fish}
\]

\[
\text{[ní.ʃà.kì]} \sim \text{[ní.ʃà.kì]} \quad \text{to scatter}
\]

\[
\text{[ní.ɲí.ʔé.ʃòŋ]} \sim \text{[ní.ɲí.ʔé.ʃòŋ]} \quad \text{to show teeth}
\]

The alveolar voiced fricative /ʒ/ occurs root initially:

\[
/\text{ní-ʒák}/ \quad \text{to castrate}
\]

A free variant of this phoneme is the sound [ʒ]:

\[
\text{[á.zʷí.yí]} \sim \text{[á.zʷí.yí]} \quad \text{breath}
\]

\[
/\text{í.ʒ̞m}/ \sim /\text{í.ʒ̞m}/ \quad \text{abuse (n)}
\]

\[
/\text{ní.ʒ̞n}/ \sim /\text{ní.ʒ̞n}/ \quad \text{to be clean}
\]

\text{Velar fricative}

The velar voiced fricative /ɣ/ occurs root initially:

\[
/\text{ní-ɣ̞m}/ \quad \text{to wait}
\]

2.1.4 Nasals

There are four nasals in Moghamo: /m/, /n/, /ɲ/ and /ŋ/.

\text{Bilabial nasal}

The bilabial nasal /m/ occurs root initially, root medially and root finally. Root initially:

\[
/\text{ŋ-m̩k}/ \quad \text{one}
\]

Root medially:

\[
/\text{á.ná.m̩}/ \quad \text{dandelion}
\]
Root finally:

\[ /\text{i.b\text{"a}m/ } \quad \text{trunk} \]

*Alveolar nasal*

The alveolar nasal /\text{n}/ occurs root initially, root medially and root finally. Root initially:

\[ /\text{\text{"a}-n\text{"a}n.k\text{"a}.d\text{"a}/ } \quad \text{cocoym} \]

Root medially:

\[ /\text{n\text{"i}.n\text{"a}.n\text{"i}/ } \quad \text{to learn} \]

Root finally:

\[ /\text{n\text{"i}.k\text{"a}n/ } \quad \text{to obstruct} \]

Sometimes words that end with /\text{n}/ drop the final consonant and a nasalized vowel is left in the coda position:

\[ /\text{n\text{"i}.b\text{"e}n/ } \rightarrow [\text{n\text{"i}.\text{\text{"i}}b\text{"e}n} ] \quad \text{to believe} \]

*Palatal nasal*

The palatal nasal /\text{ŋ}/ occurs only root initially:

\[ /\text{n\text{"a}m/ } \quad \text{animal} \]

\[ /\text{n\text{"i}.n\text{"i}/ } \quad \text{to defecate} \]

*Velar nasal*

The velar nasal /\text{ŋ}/ occurs root initially, root medially and root finally. Root initially it occurs in very few words. The following ones are attested:

\[ /\text{n\text{"i}.n\text{"a}m/ } \quad \text{to lift something heavy} \]

\[ /\text{n\text{"i}.n\text{"a}.n\text{"i}/ } \quad \text{to lift something light} \]
/â.ŋɔn/  
\textit{here}

Root medially:

/bɔŋ.ŋɔ/  \textit{before}

Root finally:

/â.káŋ/  \textit{pan}

The nasals appear in nasal-consonant combinations in morpheme-initial and morpheme-medial positions. The nasal is then assimilated to the place of articulation of the following consonant. The phonetic rule for this process is:

\[
\begin{align*}
/N/ & \rightarrow [m] / \_ \ b \\
& \rightarrow [n] / \_ \ d \\
& \rightarrow [ŋ] / \_ \ dʒ \\
& \rightarrow [ŋ] / \_ \ g 
\end{align*}
\]

Examples:

\[
\begin{align*}
[b̥bɛn] & \quad \text{bush farm} \\
[fɛ.ŋ̃dɔm] & \quad \text{k.o. caterpillar} \\
[œ.ŋ̃dʒim] & \quad \text{after} \\
[ŋ̃gɔm] & \quad \text{drum} \\
[tuŋ̃ɡɔn] & \quad \text{plantains}
\end{align*}
\]

Stem medially, the nasal-consonant combinations /Nb/, /Nd/ and /Ng/ can be explained as a coda + onset sequence:

\[
\begin{align*}
[â.ɓɔm-ɓi] & \quad \text{coincidence} \\
[nɪ.ˈtɪn-ɗɪ] & \quad \text{to be near} \\
[â.təŋ-ɡi] & \quad \text{preparer}
\end{align*}
\]
The nasal-consonant combinations are homorganic. The words ꩯbëg inside and ꩯdë? no! seem to have syllabic nasals that carry phonological tone. Otherwise, the nasals in Moghamo are not syllabic and carry tone per se (see also Casali 1995). They have previously probably been prefixes but now have lost their syllabicitity. Casali’s view is that the nasals are toneless and receive the pitch of an immediately preceding vowel if there is one and otherwise being pronounced with a relatively low pitch (1995: 164). In this paper, this is shown by an accent on the nasal⁴. In the following example, in which the same word root appears in two words one with high tone prefix and one with nasal preceding it, the nasal causes a lowering effect on the word root:

\[
\begin{align*}
\text{[i-bëg]} & \quad \text{cutlass} \\
\text{[ʔi-bëg]} & \quad \text{tapping knife}
\end{align*}
\]

2.1.5 Approximants

There are two approximants in Moghamo: /j/ and /w/.

**Palatal approximant**

The palatal voiced approximant /j/ occurs root initially:

\[
\begin{align*}
\text{/f-jê/} & \quad \text{fingernail} \\
\text{/â-jî/} & \quad \text{woman}
\end{align*}
\]

**Labial-velar approximant**

The voiced labial-velar approximant /w/ occurs root initially:

\[
\begin{align*}
\text{/á-wê/} & \quad \text{hail}
\end{align*}
\]

It is realised as the voiced labial-palatal approximant /ɥ/ before the vowel phoneme /i/:

\[
\begin{align*}
\text{[ã-uity]} & \quad \text{Batibo village} \\
\text{[i-ûn]} & \quad \text{market} \\
\text{[ù-kɨn]} & \quad \text{ulcer}
\end{align*}
\]

⁴ See section 6.1.4.
The phonetic rule for this process is:

/w/ → [ɥ] /_/i/

2.2 Consonant Modifications

Consonants can be modified by the consonant sound that follows them.

2.2.1 Labialized consonants

Several consonants in Moghamo can be labialized.

*Chart 2. Labialized consonants*¹

<table>
<thead>
<tr>
<th></th>
<th>Alveolar</th>
<th>Post alveolar</th>
<th>Velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosives</td>
<td>vl</td>
<td>tʷ</td>
<td>kʷ</td>
</tr>
<tr>
<td></td>
<td>vd</td>
<td>dʷ</td>
<td>gʷ</td>
</tr>
<tr>
<td>Affricates</td>
<td>vl</td>
<td>tʃʷ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vd</td>
<td>dʒʷ</td>
<td></td>
</tr>
<tr>
<td>Fricatives</td>
<td>vl</td>
<td>sʷ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>vd</td>
<td>zʷ</td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>nʷ</td>
<td></td>
<td>ŋʷ</td>
</tr>
</tbody>
</table>

These consonants are labialized before front and central vowels, but not before back vowels. Before /i/ it is realized with [ᶣ]. Examples are given below:

[tʷɛ̃g]  *fingers*
[ní.tʰʧ]  *to crack palm kernels*
[ŋdʰ[v]  *cloth*
[ní.kʷãb]  *to prophesy*
[ní.gʷʒ]  *to belch*
[ní.tʃʷɔʔ]  *to chew*
[dʒʷd]  *catarrh*
[ní.zʷí.ʔi]  *to descend*
[ní.zʷɛ.t̪i]  *to rest*

¹ Casali (1995: 154) lists also /bw/ without giving any example word.
² Whether nw and ŋw are to be regarded as Consonant-glide formations and not as nasal-combinations is not obvious. I follow Casali (1995: 156) and Njeck (2008: 4f) in assuming that it is a consonant-glide formation.
2.2.2 Palatalized consonants

Two consonants in Moghamo can be palatalized: /k/ and /g/\(^7\):

\[ \text{[i.k}^{j}\text{é}g] \quad \text{song} \]
\[ \text{[g}^{j}\text{i]} \quad \text{termite} \]

These cluster sounds are followed by the front vowels [i], [e] or [ɛ]. They are therefore in contrast with [k] and [g] respectively\(^8\):

\[ \text{[i.k}^{j}\text{i}] \quad \text{hunting net} \quad \text{[i.k}^{j}] \quad \text{hundred} \]
\[ \text{[g}^{j}\text{i}] \quad \text{termite} \quad \text{[g}^{j}] \quad \text{voice} \]

---

\(^7\) Njeck (2008) lists /fj/ and gives the example mafyè sweet potato (Njeck 2008: 4). Though, that seems to be a dialectal form of /máfè/.

\(^8\) See Section 2.1.1 for the treatment of the velar sounds [k] and [g].
3. Vowels

3.1 Vowel phoneme inventory

Moghamo has seven vowel phonemes\(^9\), as in Chart 3:

*Chart 3. Vowel phonemes*

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>i</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>Close-mid</td>
<td>e</td>
<td>ə</td>
<td>o</td>
</tr>
<tr>
<td>Close-open</td>
<td></td>
<td></td>
<td>œ</td>
</tr>
<tr>
<td>Open</td>
<td></td>
<td>α</td>
<td></td>
</tr>
</tbody>
</table>

All the vowel phonemes can occur in open and closed syllables in Moghamo.

The different vowel phonemes can be shown by the following contrast between sounds in open syllables:

\[
\begin{align*}
\text{[ní.tō]} & \quad \text{to sew} \\
\text{[ní.tē]} & \quad \text{to sting} \\
\text{[ní.tō]} & \quad \text{to make a will} \\
\text{[á.tī]} & \quad \text{point (n)} \\
\text{[ní.tō]} & \quad \text{to bore a hole} \\
\text{[ní.tō]} & \quad \text{to be sharp} \\
\text{[ní.tū]} & \quad \text{to be blunt}
\end{align*}
\]

\(^9\) Casali (1995) lists the close central vowel sound \([ɨ]\) as a phoneme in addition to the other seven vowel phonemes (1995: 153). In section 3.1.1 of this paper, we see that \([i]\) is an allophone of \([ɨ]\).
3.1.1 Front vowels

There are two front vowel phonemes in Moghamo: /i/ and /e/:

\[
\begin{align*}
/i/ & \quad /e/ \\
/mó.ří/ & \quad /Ngʷën/ & \quad k.o. larvae \\
/á.bín/ & \quad dance & \quad /ří.šê/ & \quad abscess \\
\end{align*}
\]

The close front vowel /i/ is realised as the close front mid-centralised sound [ɪ] after the postalveolar affricates /ʃ/ and /ʒ/\(^{10}\). It is in free variation with [i] after the approximant labial-palatal sound [ɭ]:

\[
\begin{align*}
[á.tʃí.ří] & \quad \text{umbrella} \\
[ɭdʒîm] & \quad \text{back} \\
[ní.ũí] & \quad \text{to refund} \\
[á.ɡʷi] & \sim \ [á.ɡʷi] & \quad \text{dust} \\
\end{align*}
\]

It is realised as the close central vowel [i] before the velars /k/, /g/, and /ŋ/, and after the same phonemes root initially except after /ŋ/:

\[
\begin{align*}
[á.tʃí.ří] & \quad \text{drumstick} & \quad [kí.ří] & \quad \text{still} \\
[mó.ří] & \quad \text{sap} & \quad [gí] & \quad \text{voice} \\
[á.ří.ɣí] & \quad \text{blindness} & \quad [á.ɣí] & \quad \text{thing} \\
[říŋ] & \quad \text{heart} \\
\end{align*}
\]

\(^{10}\) The [i] sound occurs also after the post-alveolar fricative sounds [ʃ] and [ʒ], which are free variants of the /s/ and /z/ phonemes. See section 2.1.3.
The close-mid front vowel /e/ is realised as the close-open front vowel [ɛ] before the voiced velar plosive sound [g] and as the close front vowel [i] before the sound [ɣ], and [ɛ] elsewhere:

/ɪ.dɛɡ/ → [i.dɛɡ] funeral

/ɑ.z̥ɛ.ɡì/ → [ɑ.z̥ɪ.ɣɪ] breath

/ɪ.Nbɛ.ɡɛ/ → [ɪ.bɛ.ɣɛ] in front

3.1.2 Central vowels

There are two central vowel phonemes in Moghamo: /ə/ and /ɑ/:  

/ə/  /ɑ/  

/ni.ɡə/ to advise  /i.ɡə/ power

/ɑ.də.ŋə.ɡə/ praying mantis  /ni.zək/ to castrate

3.1.3 Back vowels

There are three back vowel phonemes in Moghamo: /u/, /o/ and /ɔ/:  

/u/  /o/  /ɔ/  

/su/ fish  /dʒo/ snake  /ni.tʃɔ/ to hit

/ɑ.bɯ.ɯi/ abdomen  /ni.gɔɡ/ to fail  /i.bɔd/ tiredness

3.2 Nasalized vowels

Nasalized vowels occur in Moghamo. These are in contrast with the oral vowel sounds, and therefore they are phonemic also. See Chart 4:
Chart 4. Nasalized vowels

<table>
<thead>
<tr>
<th></th>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>ĩ</td>
<td>ũ</td>
<td></td>
</tr>
<tr>
<td>Close-mid</td>
<td>ĕ</td>
<td>ō</td>
<td></td>
</tr>
<tr>
<td>Close-open</td>
<td></td>
<td></td>
<td>ō</td>
</tr>
<tr>
<td>Open</td>
<td></td>
<td>ā</td>
<td></td>
</tr>
</tbody>
</table>

The following are contrasts between oral and nasal vowels:

/á.tí/  point  /á.tí/  steering  
/ní.bë/  to get mad  /ní.bë/  to believe  
/í.fâ/  air  /í.fâ/  shin  
/ká/  cashew nut  /ká/  monkey  
/í.kû/  dead (late)  /í.kû/  groin  
/ní.tô/  to bore a hole  /tô/  bitterleaf  
/ní.nô/  to rain  /í.nô/  crowd

It is assumed that the nasalized vowel gets its nasality historically from a deleted final nasal. However, both Spreda (1997) and Njeck (2008) give an example each of words that can be nasalized without there being any nasal in the environment. They list *mbëb* ‘k.o. vegetable’ and *zi*’gossip’ respectively. In the data I have access to, these words are not nasalized.
4. Syllable structure

4.1 Basic syllable types

In Moghamo, the basic syllable types are V, CV, NCV, CVC and NCVC. As for the consonant clusters with a prenasal, e.g. *mb*- , the author of this paper agrees with Casali (1995) who analysed the nasal combinations as homorganic and the prenasals as not being syllabic and phonologically tone-bearing but being part of the root syllable and phonetically tone-bearing. In a very small number of words, such as ꜜbèg tapping knife – related to ꜜbèg cutlass - and Ḟdàrì to be slow – related to Ḟtàrì cramp, the nasal seems to be a morpheme.

Historically this might have been the case, but the behaviour of the nasal-consonant combination in Moghamo today, such as the demonstratives which have the form /C+on/ 'these’ or /C+in/ ’those over there’ where /C/ stands for either /w/, /z/, /f/, /t/ or /mb/, indicates that the nasal-combinations are homorganic.

The syllable type V is limited to the vowels /i/ and /a/ in pronouns and prefixes. The syllable types CV and CVC involve all consonants and vowels. The CVC syllable type is by far the most common one. Examples of the different basic syllable types in Moghamo are presented below:

V

<table>
<thead>
<tr>
<th>Vowel</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/i/</td>
<td>/i.māɡ/</td>
<td>moon</td>
</tr>
</tbody>
</table>

CV

<table>
<thead>
<tr>
<th>Consonant</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/n/</td>
<td>/nī.zū/</td>
<td>to be cold</td>
</tr>
</tbody>
</table>

NCV

<table>
<thead>
<tr>
<th>Consonant</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ND/</td>
<td>/Ndō/</td>
<td>funnel</td>
</tr>
</tbody>
</table>

CVC

<table>
<thead>
<tr>
<th>Consonant</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/beschäft</td>
<td>/ā,tām.āt/</td>
<td>deceit</td>
</tr>
</tbody>
</table>

NCVC

<table>
<thead>
<tr>
<th>Consonant</th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>/Ngān/</td>
<td>/Ngōn/</td>
<td>warehouse</td>
</tr>
</tbody>
</table>
4.2 Modified syllable types

A glide may follow the initial consonant, resulting in the modified syllable types CGV, NCGV\textsuperscript{11}, CGVC and NCGVC:

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGV</td>
<td>/nɪ.ˈkʷɛ/</td>
<td>to cough</td>
</tr>
<tr>
<td></td>
<td>/ɡʷi/</td>
<td>termite</td>
</tr>
<tr>
<td>NCGV</td>
<td>/Ndʷi/</td>
<td>cloth</td>
</tr>
<tr>
<td>CGVC</td>
<td>/ni.tˈn̥k.ti/ → [ni.tˈn̥ʔ.i]</td>
<td>to ponder</td>
</tr>
<tr>
<td></td>
<td>/ˈɑ.ɡ̊iːn/</td>
<td>grass</td>
</tr>
<tr>
<td>NCGVC</td>
<td>/fi.Ngʷŋ/</td>
<td>salt</td>
</tr>
<tr>
<td></td>
<td>/Ng̊эɡ/</td>
<td>string</td>
</tr>
</tbody>
</table>

4.3 Noun roots

Most Moghamo noun roots are monosyllabic. Below are examples of some of the monosyllabic noun types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Example</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
<td>/i.ʒ̊i/</td>
<td>cork</td>
</tr>
<tr>
<td>NCV</td>
<td>/fi.Ndʒ̊i/</td>
<td>k.o. calabash</td>
</tr>
<tr>
<td>CGV</td>
<td>/kʷɛd/</td>
<td>scabies</td>
</tr>
<tr>
<td></td>
<td>/kʰi/</td>
<td>maize</td>
</tr>
<tr>
<td>NCGV</td>
<td>/Ndʷi/</td>
<td>cloth</td>
</tr>
</tbody>
</table>

\textsuperscript{11} Attested in one case only, that is, \textit{ⁿdʷi} ‘cloth’.
CVC /sēɡ/ twine

/ɲēd/ buffalo

CGVC /á.ɡəɡ/ k.o. basket

/.i.kʷɑb/ hoof

NCGVC /Ngʷèd/ seed

4.4 Verb roots

Most Moghamo verb roots are monosyllabic. They are of the types CV, NCV, CGV, CVC, NCVC and CGVC:\n
CV /ni.tù/ to be blunt

NCV /Ndô/ go!

CGV /ni.tʃōb/ to pinch

NCVC /Nbâk/ come!

CGVC /ni.tʷên/ to twist

12 The attested cases of verb that have nasal-consonant combinations as onsets are few.
5. Phonotactics

This section presents the distribution of consonants, vowels and syllables in morphemes and words.

5.1 Distribution of consonants

5.1.1 Onset consonants

All the consonant phonemes can occur in the onset of a syllable:

<table>
<thead>
<tr>
<th>Labials</th>
<th>/p/</th>
<th>/pəŋ/</th>
<th>cow</th>
<th>/t/</th>
<th>/tɪ.ˈbɪd/</th>
<th>excrement</th>
</tr>
</thead>
<tbody>
<tr>
<td>/p/</td>
<td>/b/</td>
<td>/b/</td>
<td>to touch</td>
<td>/d/</td>
<td>/d/</td>
<td>front of neck</td>
</tr>
<tr>
<td>/f/</td>
<td>/f/</td>
<td>/f/</td>
<td>to snore</td>
<td>/s/</td>
<td>/s/</td>
<td>to scatter</td>
</tr>
<tr>
<td>/m/</td>
<td>/m/</td>
<td>/m/</td>
<td>to finish</td>
<td>/n/</td>
<td>/n/</td>
<td>house</td>
</tr>
<tr>
<td>/n/</td>
<td>/n/</td>
<td>/n/</td>
<td>postalveolars/palatals</td>
<td>/tʃ/</td>
<td>/tʃ/</td>
<td>sneeze</td>
</tr>
<tr>
<td>/tʃ/</td>
<td>/dʒ/</td>
<td>/dʒ/</td>
<td>fly (n)</td>
<td>/ɡ/</td>
<td>/ɡ/</td>
<td>shake</td>
</tr>
<tr>
<td>/j/</td>
<td>/j/</td>
<td>/j/</td>
<td>woman</td>
<td>/ŋ/</td>
<td>/ŋ/</td>
<td>here</td>
</tr>
<tr>
<td>/ŋ/</td>
<td>/ŋ/</td>
<td>/ŋ/</td>
<td>hair</td>
<td>/w/</td>
<td>/w/</td>
<td>wisdom</td>
</tr>
<tr>
<td>/w/</td>
<td>/w/</td>
<td>/w/</td>
<td>that one over there</td>
<td>[ɥɪn]</td>
<td>[ɥɪn]</td>
<td>that one over there</td>
</tr>
</tbody>
</table>

[Velars/Labialvelar]
5.1.2 Coda consonants

Seven consonant phonemes occur in the coda of a syllable: /b/, /d/, /g/, /k/, /m/, /n/ and /ŋ/:

/b/ /nɒb/ house
/d/ /ˈæ.bʊ.dɔ.ˈbʊd/ peace
/g/ /nɪ.ˈzʊɡ/ to hear
/k/ /ɪ.tʃdɪk/ → [ɪ.tʃdʔ] rattle
/m/ /fə.ˈNdʊm/ k.o. caterpillar
/n/ /ˈæ.ɡɹɛn/ grass
/ŋ/ /nbiŋ/ lump

5.2 Distribution of vowels

All the oral vowel phonemes can occur in closed and open syllables.

5.2.1 Closed syllables

/i/ /mɪ.ˈnɪɡ/ water
   [fiŋ] heart
   [i.ˈtɨd] fire
/e/ /ni.ɡʷˈɛd/ arrive
   [fɛɡ] new
/ə/ /ˈɑ.ɣi.dʒig/ food
/ɑ/ /ˈɑ.ˈfʊb/ button
/u/ /ˈɑ.ˈfʊb/ darkness
/o/ /ˈɑ.ˈtɔn/ meaning
/ɔ/ /nɪ.ˈbʊd/ to be weak
5.2.2 Open syllables

\(/\i/ \quad /\acute{\text{t}}\acute{\text{i}}/ \quad \text{point}\)

\([\text{n}\acute{i}.\text{t}][\text{e}]\acute{\text{i}}.\text{t}i]\) to teach

\(/\acute{o}/ \quad /\acute{o}.\text{n}\acute{e}/ \quad \text{so}\)

\(/\alpha/ \quad /\text{N}\acute{\text{d}}\acute{\text{a}}/ \quad \text{k.o. dance}\)

\(/\alpha/ \quad /\text{t}i.\text{s}\acute{\text{a}}/ \quad \text{mat}\)

\(/\u/ \quad /\acute{\text{a}}.\text{d}u.\text{d}i/ \quad \text{spring}\)

\(/\o/ \quad /\acute{\text{a}}.\text{d}\acute{o}/ \quad \text{liver}\)

\(/\o/ \quad /\acute{\text{f}}\acute{\text{f}}/ \quad \text{odour}\)

5.3 Distribution of syllables

Word roots may have disyllabic structure as a result of resyllabification. In this case the second syllable has an [i] sound, or repeats the sound of the first syllable:

CVCV \(/\acute{\text{a}}.\text{b}\acute{\text{o}}.\text{b}i/ \quad \text{decaded thing}\)

\(/\text{f}o.\acute{\text{y}}.\text{b}o/ \quad \text{k.o. palmmut}\)

\(/\acute{\text{n}}.\text{d}e/ \quad \text{k.o. dance}\)

\(/\text{n}\acute{i}.\text{t}j\acute{u}.\text{g}i/ \quad \text{to sit}\)

\(/\text{n}\acute{i}.\text{f}e.\text{b}e/ \quad \text{to misuse}\)

Word stems may contain a root plus a verbal extension. The form of the extensions is [-bi], [-di], [-gi], [-ni], [-ri] or [-ti]. The coda consonant of the root and the onset of the extension can assimilate creating the following forms: [-ki], [-pi] and [-ti].

CV.CV \([\acute{\text{a}}.\text{f}\acute{\text{a}}-\text{n}\acute{\text{f}}]\) pincer

\([\text{n}\acute{i}.\text{b}\acute{e}-\text{ri}]\) to have
[ní.ɕi-tì] \quad to\ answer

/ni.ʃuŋ.gí/ \rightarrow [nì.ʃuŋ.ɬí] \quad to\ wipe\ a\ spot

/á.kɔb.bi/ \rightarrow [á.kɔb.pi] \quad piece

/if.ʃód.tí/ \rightarrow [if.ʃó.tí] \quad unity

**CVC.CV** \quad [í.ʃí.nóm-bí] \quad insects\ (lit.\ biting\ things)

[ní.tʃèn-dì] \quad to\ shine

[â.ɲəŋ-gí] \quad unsteadiness

[ní.ɬóm-ɭí] \quad to\ make\ dry

[á.ɣyɣ-rí] \quad bony\ thing

When the first syllable of the stem has a root that ends with a plosive, it can be resyllabified as an onset to the following syllable:\(^{13}\):

\[\text{CVC.CV} \quad \text{[ní.}\overset{\text{6}}{\text{gɔ.bɔ.rí}} \text{]} \rightarrow \text{[ní.}\overset{\text{6}}{\text{gɔb.rí}} \text{]} \quad \text{to\ be\ corrupt}\]

\[\text{[â.ɲʷ}\overset{\text{7}}{\text{ʔa.ʔa.rí}} \text{]} \rightarrow \text{[â.ɲʷ}\overset{\text{7}}{\text{ʔa.ʔa.rí}} \text{]} \quad \text{book}\]

---

\(^{13}\) See more about the process of resyllabification in section 7.1 and 7.4, which deal with phrasal words.
6. Tone

Moghamo has mono- and disyllabic word roots. Many disyllabic roots in Grassfields Bantu languages have over time dropped segmental substances of their second syllable and thus created many monosyllabic word roots. The tones still persist in the pronunciation of the words creating certain tone melodies (Watters 2003: 237).

Moghamo makes use of both grammatical and lexical tone.

6.1 Grammatical tone

Grammatical tone is evident in the imperative mood, which tends to raise the pitch compared with the tone pattern for the verb in its bare form of the infinitive:

\[
[tʃɛ] \quad \text{pass} \quad \rightarrow \quad [tʃɛ] \quad \text{pass!}
\]

\[
[kɔm.bi] \quad \text{nail} \quad \rightarrow \quad [kɔm.bi] \quad \text{nail!}
\]

\[
[kɑn] \quad \text{fry} \quad \rightarrow \quad [kɑn] \quad \text{fry!}
\]

Moghamo uses a as verbal suffix when the verb is in imperfective aspect. The suffix tone is then Mid-low for verbs with an underlying High tone. If the verb is verbal stative, the suffix tone is Mid for verbs with an underlying High tone. Examples:

/á.bèkà nòbò zè bùk-á/ the wall is breaking apart
wall PROG break-IMPF

/á.bèkà nòbò bùk-ã/ the wall is broken
wall break-STAT

6.2 Lexical tone

Eight different phonetic pitches can be found on syllables in isolation\(^{14}\), five level pitches\(^{15}\) and three contour pitches. Here they are represented as diacritics on single vowels: High [\(\acute{\text{a}}\)], Downstepped high [\(\breve{\text{a}}\)], Mid [\(\text{a}\)], Low- falling [\(\breve{\text{a}}\)], High-low [\(\acute{\text{a}}\)], Mid-low [\(\tilde{\text{a}}\)] and Low-mid [\(\tilde{\text{a}}\)].

---

\(^{14}\) Meta' has ten including Downstepped high-low and Low-downstepped high (Spreda 1986: 10, 14).

These pitches can be seen as variations or combinations of five tone melody tonemes: /H/, /M/, /L/, /HL/ and /LH/ which in turn are representations of the two underlying forms High and Low.

The pairs below show contrast between the tonemes in the similar environment:

/L/ v /H/

/tù.tè/  k.o. larvae  /tí.Ngòŋ/  k.o. bird

/tù.té/  pepper  /tí.Ngáŋ/  monitor lizard

/L/ v /M/

/ní.bòn/  to be absent
/ní.bān/  to trap

/L/ v /HL/

/à.kò/  witchcraft
/à.kō/  beginning

/L/ v /LH/

/Nbǎk/  button  /Ngǎk/  k.o. cocoyam
/Nbǎk/  father  /Ngǎk/  finger joint

/M/ v /H/

/ì.bèg/  kola nut

/M/ v /LH/

/Nbōm/  cowrie shell

/Nbōm/  paint
The five level tones are High [á], Downstepped high [¹á], Mid [ã], Low [õ] and Low-falling [â].

The Downstepped high tone is an allotone of the High toneme /H/ occurring after a non-high pitch (Spreda 1986: 11). The tone is then associated with a monosyllabic word root.

Examples:

\[
\begin{align*}
[\breve{b}ég] & \quad \text{tapping knife} \\
[fe.\breve{m}á] & \quad \text{k.o. fruit} \\
[tí.\breve{g}ôñ] & \quad \text{monitor lizard}
\end{align*}
\]

It is also in free variation with the High pitch on nominal prefixes:

\[ /\acute{a}.\breve{y}ôn/ \rightarrow [\acute{a}.\breve{y}ôn] \sim [\acute{y}.\breve{y}ôn] \quad \text{illness} \]

The Low tone is underlying Low-High. The High tone is evident on a toneless segment between morphemes\(^{16}\). Example:

\[
\begin{align*}
[\acute{a}.tʃôb] & \quad \text{leopard} \\
[\acute{a}.tʃô.\breve{b}ânôb] & \quad \text{leopard of house}
\end{align*}
\]

Low-falling pitch is an allotone of the Low toneme occurring only utterance or pause finally. It is realised as Low in other environments:

\[
\begin{align*}
[\breve{d ô}] & \quad \text{boundary} \\
[\breve{d ô} \zêg] & \quad \text{which boundary?}
\end{align*}
\]

The Mid pitch is a representation of an underlying High tone. In the following example, a tone is realised as Mid pitch after an underlying Low tone, and realised as High pitch in another context:

\[
\begin{align*}
[\acute{a}.tôn] & \quad \text{bottom} \\
[\acute{a}.tôn] & \quad \text{under}
\end{align*}
\]

---

\(^{16}\) See Section 6.4.
The Mid pitch is also representation of an underlying Low tone. In the following example, a tone is realised as Mid pitch after an underlying High tone, and realised as Low pitch in another context:

\[ \text{[fí.kʰíŋ]} \quad \text{pot} \]
\[ \text{[í.tʃòɡí.fí.kʰíŋ]} \quad \text{mouth of pot}^{17} \]

6.2.2 Contour tone

The three contour tones in words in isolation are High-low [ᵊ], Mid-low [ã], and Low-mid [ã].

The falling contour tones have High-low as underlying form, whereas the rising tone has Low-high as underlying form. The High-low is realised as High-low pitch on a root following a prefix carrying a High tone whereas it is realised as Mid-low pitch on a root following a prefix carrying a Low tone. Examples:

\[ \text{[mó.zên]} \quad \text{vomit (n)} \]
\[ \text{[í.nó.ŋí]} \quad \text{stock} \]
\[ \text{[fí.fó?] \quad \text{cockroach}} \]
\[ \text{[ã.gãŋí]} \quad \text{anger} \]

The Low-high is realised as Low-mid on a root that follows a prefix carrying a Low tone. There is no attested case where a rising tone is preceded by a prefix carrying a High tone. Examples:

\[ \text{[tì.nùd]} \quad \text{leech} \]
\[ \text{[sà.mí]} \quad \text{field} \]

The representation of the underlying High-low and Low-high tones on a phonetic level is shown in Figure 1 below:

---

Figure 1. Contour tones

[HL]  \quad \quad /HL/
[ML]  \quad /HL/
[LM]  \quad /LH/

---

\(^{17}\) Example adapted from Spreda (1986: 11f).
6.3 Tone on nouns

6.3.1 Tone on nominal prefixes

Nominal prefixes have either High\(^\text{18}\) or Low tone, in both singular and plural, and for all noun classes that have visible prefixes. The tone of the prefixes affects the tone on the noun root.

Examples:

\[ [təŋ] \quad \text{umbilical cord} \]
\[ [fɪ.təŋ] \quad \text{navle} \]
\[ [fɪ.kɪŋ] \quad \text{pot} \]
\[ [l.kɪŋ] \quad \text{pipe} \]

As has been stated elsewhere in this paper\(^\text{19}\), the nasal of a homorganic nasal-consonant combination is not a phonologically tone-bearing prefix carrying tone per se. The nasal is toneless and receives the pitch of an immediately preceding vowel if there is one and is otherwise pronounced with a relatively low pitch. If there is no preceding vowel, we mark the nasal with a grave accent. Otherwise, it is marked with the tone of the preceding vowel.

6.3.2 Tone on noun roots

Seven phonetic pitches can occur as tone melodies on monosyllabic noun roots. Six pitches can occur as tone melodies on disyllabic noun roots. See Chart 5 below:

---

\(^{18}\) High and Downstepped high pitch are here in free variation. See Section 6.1.1.

\(^{19}\) See section 2.1.4 and 4.1 concerning low tone associated with nasals in nasal-consonant combinations.
### Chart 5. Tone melodies on syllables in Moghamo noun roots

<table>
<thead>
<tr>
<th>Tone melody</th>
<th>Prefix tone</th>
<th>Monosyllabic noun roots</th>
<th>Disyllabic noun roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>á.yá</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>distance</td>
<td>fí.zéd</td>
<td>á.kú.ʔí</td>
</tr>
<tr>
<td>L</td>
<td>tí.kó</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>deaf</td>
<td>tí.náʔ</td>
<td>á.kú.ʔí</td>
</tr>
<tr>
<td></td>
<td></td>
<td>chameleon</td>
<td>tailbone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fá.yó.bó</td>
<td>k.o. palmnut</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.ḥó.bó.ró</td>
<td>k.o. dance</td>
</tr>
<tr>
<td>D</td>
<td>H</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tí.ḥè.góň</td>
<td>á.ḥó.dóňí</td>
</tr>
<tr>
<td></td>
<td></td>
<td>monitor lizard</td>
<td>long thing</td>
</tr>
<tr>
<td>L</td>
<td>---</td>
<td>fè.ḥó.bó.k.o. tree</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fè.ḥó.dóňí k.o. caterpillar</td>
<td>---</td>
</tr>
<tr>
<td>M</td>
<td>H</td>
<td>tí.ḥè. poder</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mí.bóŋ bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb box</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí.ḥè.</td>
<td>larvae</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>lı́dá</td>
<td>k.o. dance</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>i. bód mother</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kó. bı́e love</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kó. bı́e love</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td>L</td>
<td>tí. să.</td>
<td>soap bubble</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>mat</td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>á.kúb bı́le</td>
<td>---</td>
</tr>
</tbody>
</table>

6.4 Tone on multimorpheme lexemes

The tone pattern on the morphemes of a Moghamo associative phrase or compound is not necessarily the same as the tone pattern on these morphemes as individual lexemes, because of interaction between morphemes that carry certain tone melodies.

Often an epenthetic vowel is inserted between the morphemes in order to give the ideal syllable structure. It seems that this vowel is toneless in Moghamo.

When the first morpheme carries a Low tone that has an underlying Low-High, the epenthetic vowel takes a Mid tone. Example:

\[
\text{[i.ðëb]} \quad \text{jealousy}
\]
\[
\text{[i.ðë.ðí-nàm]} \quad \text{crop of bird}
\]

---

20 The modified syllables do not show different behaviour from the unmodified ones. They are therefore included in each syllable pattern.
When the first morpheme carries a Low tone with an underlying Low, the epenthetic vowel takes a Low tone. Example:

[wɔd]  
[ʔɔð.ɾə-tɔm]  

person  
messenger

As for the second morpheme, the tone on its root tends to be lowered. The prefix or the epenthetic vowel never raises the root pitch to High. Examples:

[í.né.mí]  
tongue  +  [í.wid]  
fire  →  [í.né.mí-wid]  
flame

[fi.tɔm]  
star  +  [í.mɔg]  
moon  →  [fi.tɔ-mɔg]  
star

[á.kúb.ɾi]  
lid  +  [í.ɾi]  
knee  →  [á.kúb.ɾɔ-nɾi]  
knee cap

When the first morpheme ends with a vowel and the prefix of the second morpheme is a vowel, the tone of the former prevails over the latter. Example:

[á.ɾíbá.tu]  
flat thing  +  [á.káŋ]  
basin  →  [á.ɾíbá.tɔ-kaŋ]  
plate

[ã.mɔ.ní]  
learner  +  [ã.nɔg]  
thing  →  [ã.mɔ.ní-nɔg]  
disciple

6.5 Tone on verbs

In dealing with tone on verbs, we have used the infinitive form of the verb, which has the prefix - as infinitive marker. The prefixed infinitive form attached to the verbs provides a consistent tone frame, and avoids possible emphatic stressing as well.

6.5.1 Tone on verb roots

Four phonetic pitches, that is Downstepped High [ˈá], Mid [ã], Low [ã] and Low-Falling [ã] can occur on monosyllabic verb roots. Two surface tone melodies, that is Downstepped High [ˈá] and Low [ã] can occur as tone melodies on disyllabic verb roots.

<table>
<thead>
<tr>
<th>Tone melody</th>
<th>Monosyllabic verb roots</th>
<th>Disyllabic verb roots</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
<td>CVC</td>
<td>CV.CV</td>
</tr>
<tr>
<td>D</td>
<td>ní.ˈfɛ to lock</td>
<td>---</td>
</tr>
<tr>
<td>M</td>
<td>ní.tʌ to sew</td>
<td>ní.kʌd to coil</td>
</tr>
<tr>
<td>L</td>
<td>ní.pɛ to arrive</td>
<td>ní.gɔ to fail</td>
</tr>
</tbody>
</table>

Chart 6. Tone melodies on syllables in Moghamo verb roots.
Note that the Mid tone melody on CVC syllables is realised as Downstepped high on the disyllabic verb roots.

6.5.2 Tone on verb stems

Word stems that contain a root plus a verbal extension are disyllabic. A verb root that has a Mid or Downstepped high tone always gets the tone pattern Downstepped high on the stem, as seen in the following example:

[ní.βin]     to dance     [ní.βin-ɗdi]  to shiver

[ní.tʃ[tʃi]  to show     [ní.tʃ[ʃi-ɗti]  to teach

The verbal extension does not change the tone pattern for the low tone verbs:

[ní.tʃ[ʔʔ]  to uproot     [ní.tʃ[ʔʔ]-ɾi]  to pull out
7. Morphophonemics

When words in phrases do not obtain an ideal syllable structure some strategies are employed to correct it. These are epenthesi (insertion of a sound), elision (deletion of sound) and coalescence (merging of two sounds into one).

7.1 Epenthesi

There are cases in Moghamo where word final (underlying) consonants – mostly plosives - are re-syllabified as an onset to a syllable that contains an epenthetic vowel. The epenthetic vowel does not carry a tone in itself. It is toneless and carries the tone from a preceding syllable. Examples:

/á.wàd-ɲ âm/ → [á.wà.ɾì-ɲ âm] cutter of meat
/á.tóg mód/ → [á.tó.ɣó mód] his head
/á.nóg mód/ → [á.nó.ɣó mód] his thing

7.2 Elision

When two vowels occur next to each other across word boundaries, usually the first vowel of the second word is elided:

/á.kô.mi ɪ.ʒêd/ → [á.kô.mi-ʒêd] carpenter

Often the elision is compensated with lengthening of the vowel sound:

/ábâ ǎzêd/ → [ábáːzêd] plank
/ábə ǎnôg/ → [ábəːnôg] wicked one

Word final /n/ (and less commonly /ŋ/ and /m/) is often elided. The preceding vowel is then nasalized:

---

22 The High-mid pitch, which does not occur on syllables in isolated word roots, occurs on separate syllables in phrasal words.
Sometimes the prefix of the second word of a phrase is elided:

/ά.φο.κό τι.βίδ/ → [ά.φο.ʔό-βίν] dung beetle

/ί.𝑓ύμ⋅ʔ.νόν/ → [ί.𝑓ύμ-νόν] my bird

7.3 Coalescence

Coalescence may occur when a vowel with a different quality from either vowel results:

/tι.κόνι ά.ςάν/ → [τικόν纪委ςή-ζάν] midrib of palm frond

/ί.βι.γι ά.ςόν/ → [ίβιγιό-νόν] anus

7.4 Reduplication

Reduplication of the word root occurs in nouns, adverbs and adjectives, but not in verbs.

Adverbs:

/ά.φέ.ʤ.ʤέ/ → [ά.φέ.ʧέ-ʧέ] jokingly

Nouns:

/ά.βό.ʤ.ʤό/ → [ά.βό.ʧό-ʧό] peace

/tέ.ʤό.ʤέ.ʤέ.ʤέ/ → [tέ.ʤό-ʤό] spider

Adjectives:

/ί.ʦό.ʦό.ʦό.ʦό/ → [ί.ʦό-ʦό] many
8. Conclusion

This paper has presented a basic introduction to the phonology of Moghamo. More research is needed for a fuller description of the sound system of the Moghamo language. This is especially the case for tone, the morphophonemic processes involved and grammatical tone. The section on tone in this phonology has to be viewed as a preliminary tone description, while waiting for a tone analysis paper.
References


Spreda, Klaus (1997) *Field notes: studies towards the segmental portion of an alphabet proposal for Moghamo*. Yaoundé: SIL