# A TENTATIVE PHONEMIC STATEMENT OF PATEP

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## 1   INTRODUCTION

This paper is a tentative statement of the phonemes of Patep, a Melanesian language in the Morobe District of Papua New Guinea.

The Patep language is one of the six language groups in the Mumeng dialect chain within the Buang family.[1]  Patep and four of the other groups in the chain are closely enough related to be considered as dialects, but a thorough comparison of the dialects remains to be done.

The Patep language is spoken by approximately 1,200 people, many of whom live in five main villages in proximity to the road from Lae to Wau in the Morobe District.  The villages are scattered from about 13 km north of Mumeng to one located in the hills to the east of Bulolo.

This paper is based on a dictionary of approximately 800 words collected during seven months' residence in the village of Mahomba during 1972-1973 under the auspices of the Summer Institute of Linguistics.  Our language helper, Kepingia, was very helpful in checking the data.

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# 2  OUTLINE OF PHONEMES

## 2.1  Chart of Phonemes

| | | | Bilabial | | | Alveolar | | Post-palatal | |
|---|---|---|---|---|---|---|---|---|---|
| | | | plain | palatal-ized | labial-ized | plain | palatal- | plain | labialized |
| Stops | | vl | p | $p^y$ | $p^w$ | t | $t^y$ | $k̩$ | $k̩^w$ |
| | | vd | $^m b$ | $^m b^y$ | $^m b^w$ | $^n d$ | $^n d^y$ | $^ŋ g̩$ | $^ŋ g̩^w$ |
| Continuants | central | vl | | | | s | | h | |
| | | vd | ƀ | $ƀ^y$ | | $^n dz$* | y | $g̩$ | w |
| | Lateral | | | | | l | | | |
| | Nasal | | m | $m^y$ | $m^w$ | n | $n^y$ | $ŋ̩$ | $ŋ̩^w$ |

* The phoneme which has been symbolized $/^n dz/$ and described as an affricate has been included as a fricative in the phoneme chart.  Following the writing of this paper, it was decided that the phonetic quality is more that of a fricative with the alveolar stop very lenis and actually just a transition between the prenasalisation and the fricative.  Therefore the phoneme is actually /nz/ and does belong in the fricative section of the phoneme chart.

| | Front | Central | Back |
|---|---|---|---|
| HIGH | i | | u |
| MID | e | | o |
| LOW | ɛ | a | ɔ |

## 2.1.1  Symbolization of Phonemes

For the purpose of this paper the following consonant phonemes are represented by these symbols:

| | |
|---|---|
| $/\,^m b\,/$ | $/\,b\,/$ |
| $/\,^m b^w\,/$ | $/\,b^w\,/$ |
| $/\,^m b^y\,/$ | $/\,b^y\,/$ |
| $/\,^n d\,/$ | $/\,d\,/$ |
| $/\,^n d^y\,/$ | $/\,d^y\,/$ |
| $/\,\underset{.}{k}\,/$ | $/\,k\,/$ |
| $/\,\underset{.}{k}^w\,/$ | $/\,k^w\,/$ |
| $/\,^\eta \underset{.}{g}\,/$ | $/\,g\,/$ |
| $/\,^\eta \underset{.}{g}^w\,/$ | $/\,g^w\,/$ |
| $/\,\underset{.}{ɟ}\,/$ | $/\,ɟ\,/$ |
| $/\,^n dz\,/$ | $/\,z\,/$ |
| $/\,\eta\,/$ | $/\,\eta\,/$ |
| $/\,\underset{.}{\eta}^w\,/$ | $/\,\eta^w\,/$ |
| $/\,\underset{+}{w}\,/$ | $/\,w\,/$ |

## 2.2  Contrastive Features

## 2.2.1  Consonants

There is a contrast in manner of articulation between voiceless and pre-nasalized voiced stops, including labialized voiced and voiceless bilabial and backed-velar stops, palatalized voiced and voiceless bilabial and alveolar stops; voiceless fricatives; voiced fricatives, including voiced palatalized bilabial fricative; nasals, including labialized bilabial and backed-velar nasals, palatalized bilabial and alveolar nasals; lateral; and semi-vowels. The stops, fricatives, and nasals contrast at the bilabial, alveolar, and backed-velar points of articulation. The fricatives also include the glottal point of articulation. The lateral does not have a contrastive counter-point. The semi-vowels contrast at the bilabial and alveolar points of articulation.

## 2.2.2  Vowels

Vowels contrast as to high, mid, and low positions, with three front and three back vowels as well as one low open central vowel.


# 3    INTERPRETATION

## 3.1   Items which may be either consonant or vowel

There are no non-suspect consonant clusters and no non-suspect vowel clusters within syllables.  Consequently [i] and [y] are interpreted as /i/ when either occurs in a syllabic position, and /y/ when either occurs in a non-syllabic position.
[u] and [w] are interpreted as /u/ when either occurs in a syllabic position, and /w/ when either occurs in a non-syllabic position.

## 3.2   Items which may be either sequence or unit.

Pre-nasalized voiced stops are interpreted as single units because:

   (i)    all voiced stops are pre-nasalized
   (ii)   voiced stops in introduced words are similarly pre-nasalized
   (iii)  there are no non-suspect consonant clusters within words

The labialized and palatalized consonants $[p^w]$ $[^mb^w]$ $[k^w]$ $[^ŋg^w]$ $[m^w]$ $[ŋ^w]$ $[p^y]$ $[^mb^y]$ $[t^y]$ $[^nd^y]$ $[ɓ^y]$ $[m^y]$ and $[n^y]$, and the alveolar affricate $[^ndz]$ are interpreted as single units because:
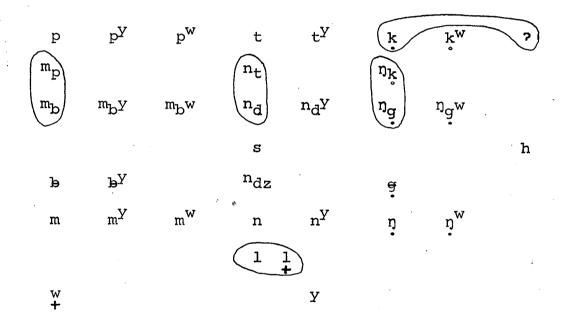
   (i)    there are no non-suspect consonant clusters within words
   (ii)   vowel clusters always comprise two syllables
   (iii)  these suspect sequences together with a following vowel comprise only one syllable

           e.g.   $['mi.a]$     /mia/     'water'
                  $['m^ya.]$     /m$^y$a/     'his mouth'

Long vowels are interpreted as single units with the suprasegmental feature of length added rather than as vowel clusters since non-suspect vowel clusters occur only across syllable boundries and lengthened vowels occur only within syllable boundaries word finally.


## DESCRIPTION OF PHONEMES

### 4.1 Consonants

### 4.1.1 Work Chart



### 4.1.2 Description

| /p/ | [p] | Voiceless, unaspirated bilabial stop occurs word initially, medially and finally (some-times with a slight release word final). |
|---|---|---|

['pɔp]          /pɔp/          'to turn'

| /pʸ/ | [pʸ] | Voiceless bilabial palatalized stop occurs word initially, but only rarely.[2] |
|---|---|---|

['pʸap]          /pʸap/          'finish'

/ $^m$b/  [$^m$b]   Voiced pre-nasalized bilabial stop occurs word initially and medially.

[kə'$^m$bun]   /kbun/   'ground'

[$^m$p]   Voiceless pre-nasalized bilabial stop occurs word finally.

[$^m$bo$^m$p]   /bob/   'to fly'

/p$^w$/   [p$^w$]   Voiceless labialized bilabial stop occurs word initially and medially, but only rarely.

[kə'p$^w$ɔʔ]   /kp$^w$ɔk/   'old man'

/ $^m$b$^w$/   [$^m$b$^w$]   Voiced labialized bilabial stop occurs word initially and medially, but only rarely.

[$^m$b$^w$ɔʔ]   /b$^w$ɔk/   'pig'

/ $^m$b$^y$/   [$^m$b$^y$]   Voiced palatalized bilabial stop occurs word initially.[2]

[$^m$b$^y$aʔ]   /b$^y$ak/   'first daughter'

/t/   [t ]   Voiceless unaspirated alveolar stop occurs word initially, medially and finally (sometimes with a slight release word final).

[tə'te]   /tte/   'to pull'

/t$^y$/   [t$^y$]   Voiceless palatalized alveolar stop occurs word initially and medially.

['t$^y$ip]   /t$^y$ip/   'to come up'

/$^n$d/   [$^n$d]   Voiced pre-nasalized alveolar stop occurs word initially and medially.

[$^n$də'$^n$dihi]   /ddihi/   'slippery'

[$^n$t]   Voiceless pre-nasalized alveolar stop occurs word finally.

['hɛ$^n$t]   /hɛd/   'fifth daughter'

/ $^n$d$^y$/   [$^n$d$^y$]   Voiced alveolar palatalized stop occurs word initially and medially.

['$^n$d$^y$oŋ]   /d$^y$oŋ/   'banana'

/ɠ̣/        [ɠ̣]        Voiced backed-velar fricative occurs word
                      initially, medially and finally.[3]

                      [ˈɠaɠ]              /ɠaɠ/              ˈtreeˈ

/m/        [m]        Voiced bilabial nasal occurs word initially,
                      medially and finally.

                      [məˈsem]            /msem/             ˈgoodˈ

/mʸ/       [mʸ]       Voiced palatalized bilabial nasal occurs
                      word initially, but only rarely.[2]

                      [ˈmʸaŋḳ]           /mʸag/             ˈmy mouthˈ

/mʷ/       [mʷ]       Voiced labialized bilabial nasal occurs
                      word initially and medially, but only rarely.

                      [ˈmʷɔʔ]             /mʷɔk/             ˈto fall downˈ

/n/        [n]        Voiced alveolar nasal occurs word initially,
                      medially and finally.

                      [ˈnon]              /non/              ˈfruit or seedˈ

/nʸ/       [nʸ]       Voiced palatalized alveolar nasal occurs
                      word initially and medially.

                      [ˈnʸaŋ]             /nʸaŋ/             ˈtaroˈ

/ŋ/        [ŋ]        Voiced backed-velar nasal occurs word
                      initially, medially and finally.

                      [ˈŋaŋ̣]             /ŋaŋ/              ˈsak-sakˈ

/ŋ̣ʷ/       [ŋ̣ʷ]       Voiced labialized backed-velar nasal occurs
                      word initially and medially, but only rarely.

                      [ˈŋʷaɠ]             /ŋʷaɠ/             ˈfireˈ

/l/        [l]        Voiced alveolar lateral occurs word
                      initially and medially.

                      [ləˈli]             /lli/              ˈanimalˈ

           [ɬ]        Voiced alveolar lateral occurs with friction
                      word finally.

                      [ˈluɬ]              /lul/              ˈbreastˈ

/w̌/      [w̟]        Voiced bilabial semi-vowel (non-syllabic)
                     with friction occurs word initially and
                     medially.

                     [bə'w̟ɛb]          /bwɛb/        'ashes'

/y/      [y]        Voiced alveopalatal semi-vowel (non-syllabic)
                     occurs word initially and medially.

                     ['yipaʔ]          /yipak/       'knife'

/h/      [h]        Voiceless glottal fricative occurs word
                     initially and medially.

                     [bə'hati̩]          /bhati/       'all'

## 4.1.3  Contrasts of Consonant Phonemes

/p/  and  /b/      ['poᵐp]              /pob/         'upper arm, thigh'
                   ['ᵐboᵐp]             /bob/         'to fly'

                   ['pɛ̧l]               /pɛl/         'bamboo'
                   ['ᵐbɛla]             /bɛla/        'type of fruit'

                   [tə'pi]              /tpi/         'to move'
                   [tə'ᵐbi:]            /tbi:/        'an outsider'

                   [kə'puᵐp]            /kpub/        'chinese taro'
                   [kə'ᵐbun]            /kbun/        'ground'

                   ['yip]               /yip/         'uncle'
                   ['yiᵐp]              /yib/         'to die'

                   ['ᵐbop]              /bop/         'headdress'
                   ['poᵐp]              /pob/         'upper arm, thigh'

/p/　and　/pʷ/　[ˈpɔⁿt]　　　　　/pɔd/　　　　ˈcombˈ

　　　T　　　　　　　[ˈpʷɔː]　　　　　/pʷɔː/　　　ˈto pickˈ


　　　T　　　　　　　[ˈpɔp]　　　　　　/pɔp/　　　　ˈto turnˈ

　　　　　　　　　　　[kəˈpʷɔᵐp]　　　/kpʷɔb/　　　ˈtype of tree barkˈ


/p/　and　/pʸ/　　[ˈpɔp]　　　　　　/pɔp/　　　　ˈto turnˈ

　　　T　　　　　　　[həˈpap]　　　　/hpap/　　　ˈto kickˈ

　　　　　　　　　　　[ˈpʸap]　　　　　/pʸap/　　　ˈfinishedˈ


　　　　　　　　　　　[ˈpɛḷ]　　　　　/pɛl/　　　　ˈbambooˈ

　　　T　　　　　　　[kəˈpe]　　　　　/kpe/　　　　ˈto fall overˈ

　　　　　　　　　　　[ˈpʸeŋ]　　　　　/pʸeŋ/　　　ˈtype of birdˈ


/b/　and　/bʷ/　　[ˈᵐbɔŋk]　　　　/bɔg/　　　　ˈmy homeˈ

　　　T　　　　　　　[ˈᵐbʷɔʔ]　　　　/bʷɔk/　　　ˈpigˈ


　　　T　　　　　　　[ˈkʷaᵐbɔ]　　　　/kʷabɔ/　　ˈclose toˈ

　　　　　　　　[ˈŋ̊gʷaːᵐbʷɔŋk]　/gʷaːbʷɔg/　ˈtype of birdˈ


　　　　　　　　　　　[ˈmʸaᵐbɔ]　　　　/mʸabɔ/　　ˈshortˈ

　　　　　　　　　　[bəˈᵐbʷɔyaʔ]　　/bbʷɔyak/　ˈtype of treeˈ


/b/　and　/bʸ/　　[ˈᵐba]　　　　　　/ba/　　　　ˈdifferentˈ

　　　T　　　　　　　[ˈᵐbʸa]　　　　　/bʸa/　　　　ˈto carryˈ


　　　T　　　　　　　[ˈᵐbeŋga]　　　　/bega/　　　ˈlike thisˈ

　　　　　　　　　　　[ˈᵐbʸeɟ]　　　　/bʸeɟ/　　　ˈto throwˈ

| | | | | |
|---|---|---|---|---|
| $/p^y/$ and $/b^y/$ | $[{}^{\textstyle\prime}p^y ap]$ | $/p^y ap/$ | 'finished' |
| T | $[{}^{\textstyle\prime m}b^y a\textglotstop]$ | $/b^y ak/$ | 'first daughter' |
| | | | |
| T | $[{}^{\textstyle\prime}p^y e\eta]$ | $/p^y e\eta/$ | 'type of bird' |
| | $[{}^{\textstyle\prime m}b^y e\gfracture]$ | $/b^y e\gfracture/$ | 'to throw' |
| | | | |
| $/t/$ and $/d/$ | $[{}^{\textstyle\prime}tu\textglotstop]$ | $/tuk/$ | 'first son' |
| T | $[{}^{\textstyle\prime n}du\textglotstop]$ | $/duk/$ | 'to wrap around' |
| | | | |
| | $[t\textschwa{}^{\textstyle\prime n}di{:}]$ | $/tdi{:}/$ | 'to turn' |
| | $[{}^{n}d\textschwa{}^{\textstyle\prime n}di{:}]$ | $/ddi{:}/$ | 'to drag' |
| | | | |
| T | $[p\textschwa{}^{\textstyle\prime}ti{:}]$ | $/pti{:}/$ | 'to spread' |
| | $[p\textschwa{}^{\textstyle\prime n}di{:}]$ | $/pdi{:}/$ | 'to flip' |
| | | | |
| | $[t\textschwa{}^{\textstyle\prime}t\varepsilon a\textglotstop]$ | $/tt\varepsilon ak/$ | 'spider' |
| | $[t\textschwa{}^{\textstyle\prime n}d\varepsilon a]$ | $/td\varepsilon a/$ | 'to play' |
| | | | |
| T | $[{}^{\textstyle\prime}b\varepsilon t]$ | $/b\varepsilon t/$ | 'to feed' |
| | $[{}^{\textstyle\prime m}b\varepsilon^{n}t]$ | $/b\varepsilon d/$ | 'our home' |
| | | | |
| | $[{}^{\textstyle\prime\eta}g\varepsilon t]$ | $/g\varepsilon t/$ | 'tongue' |
| | $[{}^{\textstyle\prime}h\varepsilon^{n}t]$ | $/h\varepsilon d/$ | 'fifth daughter' |
| | | | |
| $/t/$ and $/t^y/$ | $[{}^{\textstyle\prime}tu\textglotstop]$ | $/tuk/$ | 'first son' |
| T | $[{}^{\textstyle\prime}t^y u\textglotstop]$ | $/t^y uk/$ | 'to call out' |
| | | | |
| | $[{}^{\textstyle\prime}tip]$ | $/tip/$ | 'to tear' |
| | $[{}^{\textstyle\prime}t^y ip]$ | $/t^y ip/$ | 'to come up' |

| | | | |
|---|---|---|---|
| T | [kə'ta:] | /kta:/ | 'to plead' |
| | [kə't$^y$a] | /kt$^y$a/ | 'to wipe' |
| | [pə'tep] | /ptep/ | 'Patep' |
| | [pə't$^y$ɛp] | /pt$^y$ɛp/ | 'to sweep' |
| /k/ and /g/ | ['kɛn] | /kɛn/ | 'to carry' |
| T | ['$^ŋ$gɛn] | /gɛn/ | 'type of tree' |
| | ['kuŋ] | /kuŋ/ | 'to tamp down' |
| | ['$^ŋ$gum] | /gum/ | 'to cut crosswise' |
| T | [tə'kɛna?] | /tkɛnak/ | 'type of tree' |
| | [hə'$^ŋ$gɛna] | /hgɛna/ | 'type of tree' |
| | [kə'kuŋ] | /kkuŋ/ | 'wild dog' |
| | [bə'$^ŋ$gu$^n$t] | /bgud/ | 'fire box' |
| T | ['$^m$bu?] | /buk/ | 'day' |
| | ['$^m$bu$^ŋ$k] | /bug/ | 'my grandparent' |
| | ['le?] | /lek/ | 'but' |
| | ['le$^ŋ$k] | /leg/ | 'my name' |
| /k/ and /k$^w$/ | ['ke$^n$t] | /ked/ | 'left hand' |
| | ['k$^w$el̟] | /k$^w$el/ | 'to scratch' |
| T | ['kɛn] | /kɛn/ | 'to carry' |
| | ['k$^w$ɛm] | /k$^w$ɛm/ | 'white' |

T          $[\text{kə'kela?}]$          /kkelak/          'crocodile'
           $[\text{tə'k}^\text{w}\text{e}]$          /tk$^\text{w}$e/          'old'


           $[\text{pə'ko:}]$          /pko:/          'owl'
           $[\text{pə'k}^\text{w}\text{a:}]$          /pk$^\text{w}$a:/          'type of tree'


/k/   and   /g$^\text{w}$/   No contrasts have been found.


/k$^\text{w}$/   and  /g/      $[\text{'k}^\text{w}\text{a}]$          /k$^\text{w}$a/          'his neck'
                    $[\text{'ŋga}]$          /ga/          'here'


T          $[\text{'k}^\text{w}\text{ɛ m}]$          /k$^\text{w}$ɛ m/          'white'
           $[\text{'ŋgɛm}]$          /gɛm/          'type of tree'


           $[\text{pə'k}^\text{w}\text{a:}]$          /pk$^\text{w}$a:/          'type of tree'
           $[\text{pə'ŋgap}]$          /pgap/          'type of grass'


T          $[\text{tə'k}^\text{w}\text{e}]$          /tk$^\text{w}$e/          'old'
           $[\text{bə'ŋge}]$          /bge/          'his arm'


/k$^\text{w}$/   and  /g$^\text{w}$/      $[\text{'k}^\text{w}\text{a}]$          /k$^\text{w}$a/          'his neck'
           T          $[\text{'ŋg}^\text{w}\text{a:}]$          /g$^\text{w}$a:/          'third son'


           $[\text{'k}^\text{w}\text{el}]$          /k$^\text{w}$el/          'to scratch'
           $[\text{'ŋg}^\text{w}\text{e}^\text{m}\text{ba}]$          /g$^\text{w}$eba/          'today'


           $[\text{pə'k}^\text{w}\text{a:}]$          /pk$^\text{w}$a:/          'type of tree'
           $[\text{tə'ŋg}^\text{w}\text{aŋk}]$          /tg$^\text{w}$ag/          'type of tree'

| | | | |
|---|---|---|---|
| T | $[\text{ni}^{\prime}\text{k}^{\text{w}}\text{ɛm}]$ | /nik$^{\text{w}}$ɛm/ | 'white man' |
| | $[\text{mə}^{\prime}\text{ŋg}^{\text{w}}\text{ɛm}]$ | /mg$^{\text{w}}$ɛm/ | 'type of tree' |
| /g/ and /g$^{\text{w}}$/ | $[^{\prime}\text{ŋga}]$ | /ga/ | 'here' |
| | $[^{\prime}\text{ŋg}^{\text{w}}\text{aː}]$ | /g$^{\text{w}}$aː/ | 'third son' |
| T | $[^{\prime}\text{ŋgi}^{\text{ŋ}}\text{k}]$ | /gig/ | 'to squeeze' |
| | $[^{\prime}\text{ŋg}^{\text{w}}\text{i}^{\text{m}}\text{p}]$ | /g$^{\text{w}}$ib/ | 'cassowary' |
| T | $[\text{hə}^{\prime}\text{ŋga}ʔ]$ | /hgak/ | 'to be angry' |
| | $[\text{tə}^{\prime}\text{ŋg}^{\text{w}}\text{a}^{\text{ŋ}}\text{k}]$ | /tg$^{\text{w}}$ag/ | 'type of tree' |
| | $[\text{ɓə}^{\prime}\text{ŋgem}]$ | /ɓgem/ | 'your arm' |
| | $[\text{mə}^{\prime}\text{ŋg}^{\text{w}}\text{ɛm}]$ | /mg$^{\text{w}}$ɛm/ | 'type of tree' |
| /l/ and /t/ | $[^{\prime}\text{la}^{\text{ŋ}}\text{k}]$ | /lag/ | 'sky' |
| T | $[^{\prime}\text{ta}^{\text{ŋ}}\text{k}]$ | /tag/ | 'my mother' |
| | $[^{\prime}\text{lul}]$ | /lul/ | 'breast' |
| | $[^{\prime}\text{tul}]$ | /tul/ | 'to build' |
| T | $[^{\prime}\text{mila}]$ | /mila/ | 'salt' |
| | $[^{\prime}\text{nita}]$ | /nita/ | 'grass' |
| | $[\text{pə}^{\prime}\text{laɟ}]$ | /plag/ | 'to feel for' |
| | $[\text{pə}^{\prime}\text{tap}]$ | /ptap/ | 'to clap' |
| | $[^{\prime}\text{pɛl}]$ | /pɛl/ | 'bamboo' |
| | $[^{\prime}\text{ŋgɛt}]$ | /gɛt/ | 'tongue' |

|   |   |   |   |
|---|---|---|---|
| T | $[\text{'b}\varepsilon\underset{+}{\text{l}}]$ | /bɛl/ | 'big rock' |
|   | $[\text{'b}\varepsilon\text{t}]$ | /bɛt/ | 'to feed' |
| /l/ and /d/ | $[\text{'la}]$ | /la/ | 'to go' |
|   | $[\text{'}^n\text{da}]$ | /da/ | 'week, Sunday' |
| T | $[\text{'le}^\eta\text{k}]$ | /leg/ | 'my name' |
|   | $[\text{'}^n\text{de}^\eta\text{k}]$ | /deg/ | 'cooking pot' |
| T | $[\eta\text{ə'lag}]$ | /ŋlag/ | 'to weave' |
|   | $[\eta\text{ə'}^n\text{dag}]$ | /ŋdag/ | 'rock' |
|   | $[\text{kə'l}\varepsilon\text{n}]$ | /klɛn/ | 'coals' |
|   | $[\text{kə'}^n\text{d}\varepsilon\text{n}]$ | /kdɛn/ | 'to chop' |
| T | $[\text{'}^\eta\text{go}\underset{+}{\text{l}}]$ | /gol/ | 'to cut' |
|   | $[\text{'}^\eta\text{go}^n\text{t}]$ | /god/ | 'type of tree' |
|   | $[\text{'p}\varepsilon\underset{+}{\text{l}}]$ | /pɛl/ | 'bamboo' |
|   | $[\text{'}^m\text{b}\varepsilon^n\text{t}]$ | /bɛd/ | 'our home' |
| /l/ and /n/ | $[\text{'la}]$ | /la/ | 'to go' |
|   | $[\text{'na}]$ | /na/ | 'where' |
| T | $[\text{'lem}]$ | /lem/ | 'your name' |
|   | $[\text{'nem}]$ | /nem/ | 'to have' |
|   | $[\text{'}^m\text{b}\varepsilon\text{la}]$ | /bɛla/ | 'type of fruit' |
|   | $[\text{'b}\varepsilon\text{na}]$ | /bɛna/ | 'to return' |

| | | | |
|---|---|---|---|
| T | [ŋə'ᵐbila] | /ŋbila/ | 'often' |
| | [ŋə'ᵐbina] | /ŋbina/ | 'to wring' |
| | | | |
| | ['ɓɛḻ] | /ɓɛl/ | 'big rock' |
| | ['ᵐbɛn] | /bɛn/ | 'his home' |
| | | | |
| T | [kə'yiḻ] | /kyil/ | 'to step over' |
| | [ɓə'yin] | /ɓyin/ | 'heavy' |
| | | | |
| /y/ and /s/ | ['yɛɓ] | /yɛɓ/ | 'to dig' |
| T | ['sɛɓ] | /sɛɓ/ | 'to cut' |
| | | | |
| | ['yi:] | /yi:/ | 'a spear' |
| | ['si] | /si/ | 'to roast' |
| | | | |
| | ['yu] | /yu/ | 'to hang up' |
| | ['su] | /su/ | 'to put in' |
| | | | |
| | [kə'yaŋ] | /kyaŋ/ | 'talk' |
| | [kə'saᵑk] | /ksag/ | 'type of tree' |
| | | | |
| | [kə'yiḻ] | /kyil/ | 'to step over' |
| | [pə'siɓ] | /psiɓ/ | 'incorrectly' |
| | | | |
| T | [nə'yu:] | /nyu:/ | 'green' |
| | [kə'su:] | /ksu:/ | 'to buy' |
| | | | |
| /y/ and /ɟ/ | ['ya] | /ya/ | 'he eats' |
| | ['ɟa] | /ɟa/ | 'I eat' |

|   |   |   |   |
|---|---|---|---|
|   | [ˈyɛn] | /yɛn/ | 'parent-in-law' |
|   | [ˈɟɛn] | /ɟɛn/ | 'we three, exc.' |
| T | [ˈyuʔ] | /yuk/ | 'to drip' |
|   | [ˈɟuʔ] | /ɟuk/ | 'type of tree' |
| T | [bəˈyeb] | /byeb/ | 'type of snake' |
|   | [bəˈɟɛb] | /bɟɛb/ | 'arrow' |
|   | [tɔˈyo:] | /tyo:/ | 'to close' |
|   | [bəˈɟo:] | /bɟo:/ | 'type of tree' |
|   | [nəˈyu:] | /nyu:/ | 'green' |
|   | [təˈɟu:] | /tɟu:/ | 'to try' |
| /y/ and /nʸ/ | [ˈyaŋ] | /yaŋ/ | 'very' |
|   | [ˈnʸaŋ] | /nʸaŋ/ | 'taro' |
| T | [ˈyɛn] | /yɛn/ | 'parent-in-law' |
|   | [ˈnʸɛn] | /nʸɛn/ | 'flavorful' |
| T | [ˈyu:] | /yu:/ | 'two' |
|   | [ˈnʸu:] | /nʸu:/ | 'to warm oneself' |
|   | [bɔˈyi] | /byi/ | 'reed like plant' |
|   | [bəˈnʸi:] | /bnʸi:/ | 'type of fish' |
| T | [bəˈyum] | /byum/ | 'to wrap' |
|   | [bɔˈnʸum] | /bnʸum/ | 'to wear' |

| /y/ and /tʸ/ | [ˈyuʔ] | /yuk/ | 'to drip' |
| | [ˈtʸuʔ] | /tʸuk/ | 'to call out' |
| | | | |
| T | [ˈyip] | /yip/ | 'your uncle' |
| | [ˈtʸip] | /tʸip/ | 'to come up' |
| | | | |
| T | [kəˈyaŋ] | /kyaŋ/ | 'talk' |
| | [kəˈtʸaɠ] | /ktʸaɠ/ | 'a sore' |
| | | | |
| | [ŋəˈyi] | /ŋyi/ | 'fourth son' |
| | [ŋəˈtʸihi] | /ŋtʸihi/ | 'shrimp' |
| | | | |
| /ɓ/ and /p/ | [ˈɓuɓ] | /ɓuɓ/ | 'to chop' |
| | [ˈpup] | /pup/ | 'full' |
| | | | |
| T | [ˈɓɛl̜] | /ɓɛl/ | 'big rock' |
| | [ˈpɛl̜] | /pɛl/ | 'bamboo' |
| | | | |
| T | [ˈliɓa] | /liɓa/ | 'type of tree' |
| | [ˈlipaʔ] | /lipak/ | 'knife' |
| | | | |
| | [kəˈɓuː] | /kɓuː/ | 'to write' |
| | [həˈpu] | /hpu/ | 'stem of tree' |
| | | | |
| T | [ˈkɔɓ] | /kɔɓ/ | 'ax' |
| | [ˈɠɔp] | /ɠɔp/ | 'type of palm' |
| | | | |
| | [ˈluɓ] | /luɓ/ | 'to peel' |
| | [ˈtup] | /tup/ | 'to run' |

| /ƀ/ and /b/ | [ˈƀuaʔ] | /ƀuak/ | 'to boil' |
|---|---|---|---|
| T | [ˈᵐbuaʔ] | /buak/ | 'pit-pit' |
| | [ˈƀɔp] | /ƀɔp/ | 'sibling-in-law' |
| | [ˈᵐbɔm] | /bɔm/ | 'your home' |
| T | [nəˈƀu] | /nƀu/ | 'his teeth' |
| | [nəˈᵐbu] | /nbu/ | 'his chest' |
| | [kəˈƀa] | /kƀa/ | 'to carry' |
| | [kəˈᵐbaŋ] | /kbaŋ/ | 'lime' |
| T | [həˈyoƀ] | /hyoƀ/ | 'sun' |
| | [ƀəˈyoᵐp] | /ƀyob/ | 'cloud' |
| | [ˈpiƀ] | /piƀ/ | 'to carry' |
| | [ˈyiᵐp] | /yib/ | 'to die' |
| /ƀ/ and /w/ | [ˈƀe] | /ƀe/ | 'plant shoots' |
| T | [ˈwe] | /we/ | 'you see' |
| | [ˈƀɛƀ] | /ƀɛƀ/ | 'to light a fire' |
| | [ˈwɛᵐp] | /wɛb/ | 'put in bamboo' |
| T | [kəˈƀa] | /kƀa/ | 'to carry' |
| | [ƀəˈwa] | /ƀwa/ | 'his nephew' |
| | [pəˈwil] | /pwil/ | 'to rotate' |
| | [həˈƀip] | /hƀip/ | 'to comb, flip' |

/ƀ/ and /pʷ/     No contrasts have been found.

/ƀ/ and /bʷ/     No contrasts have been found.

| | | | |
|---|---|---|---|
| /ƀ/ and /ƀʸ/ | [ˈƀa] | /ƀa/ | 'what' |
| T | [ˈƀʸa] | /ƀʸa/ | 'his language' |
| | | | |
| T | [ˈƀa̱l] | /ƀal/ | 'return' |
| | [ˈƀʸaŋ] | /ƀʸaŋ/ | 'drum' |
| | | | |
| /s/ and /t/ | [ˈsi] | /si/ | 'to roast' |
| | [ˈti] | /ti/ | 'one' |
| | | | |
| T | [ˈsag̑] | /sag̑/ | 'to squeeze' |
| | [ˈtag̑] | /tag̑/ | 'to open' |
| | | | |
| T | [kə̣ˈsuː] | /ksuː/ | 'to buy' |
| | [kə̣ˈtuː] | /ktuː/ | 'joint' |
| | | | |
| | [pə̣ˈsiƀ] | /psiƀ/ | 'incorrectly' |
| | [kə̣ˈtiƀ] | /ktiƀ/ | 'to hit' |
| | | | |
| /s/ and /tʸ/ | [ˈsu] | /su/ | 'to put in' |
| T | [ˈtʸuʔ] | /tʸuk/ | 'to call out' |
| | | | |
| | [ˈsi] | /si/ | 'to roast' |
| | [ˈtʸip] | /tʸip/ | 'to come up' |
| | | | |
| T | [kə̣ˈsaᵑk] | /ksag/ | 'type of tree' |
| | [kə̣ˈtʸag̑] | /ktʸag̑/ | 'a sore' |

|  |  |  |  |
|---|---|---|---|
|  | [kə'seᵐp] | /kseb/ | 'to sneeze' |
|  | [kə'tʸɛn] | /ktʸɛn/ | 'edible palm' |
| /s/ and /d/ | ['si] | /si/ | 'to roast' |
|  | ['ⁿdi:] | /di:/ | 'to tear down' |
| T | ['su] | /su/ | 'to put in' |
|  | ['ⁿdu:] | /du:/ | 'to pierce' |
| T | [kə'su:] | /ksu:/ | 'to buy' |
|  | [kə'ⁿdu] | /kdu/ | 'to group' |
|  | [pə'sib] | /psib/ | 'incorrectly' |
|  | [pə'ⁿdi] | /pdi/ | 'rice' |
| T | [kə'seᵐp] | /kseb/ | 'to sneeze' |
|  | [ŋə'ⁿdeᵑk] | /ŋdeg/ | 'my cousin' |
| /s/ and /ⁿdz/ | ['sag] | /sag/ | 'to squeeze' |
| T | ['ⁿdzaŋ] | /zaŋ/ | 'yellow' |
|  | ['si] | /si/ | 'to roast' |
|  | ['ⁿdzilaʔ] | /zilak/ | 'type of tree' |
|  | [pə'sib] | /psib/ | 'incorrectly' |
|  | [bə'ⁿdziⁿt] | /bzid/ | 'a feast' |
| T | [mə'sem] | /msem/ | 'good' |
|  | [ŋə'ⁿdzem] | /ŋzem/ | 'type of tree' |

| /s/ and / $^n$d$^y$/ | [ˈsɔɟ] | /sɔɟ/ | 'to jump' |
|---|---|---|---|
| T | [ˈ$^n$d$^y$oŋ] | /d$^y$oŋ/ | 'banana' |
| | [kəˈsuː] | /ksuː/ | 'to buy' |
| | [ŋəˈ$^n$d$^y$u] | /ŋd$^y$u/ | 'to fold arms' |
| T | [pəˈsuɓ] | /psuɓ/ | 'to spit' |
| | [ɓəˈ$^n$d$^y$uɓa] | /ɓd$^y$uɓa/ | 'dust' |
| | [pəˈsiɓ] | /psiɓ/ | 'incorrectly' |
| | [həˈ$^n$d$^y$ihi] | /hd$^y$ihi/ | 'grubs' |
| /t/ and / $^n$dz/ | [ˈta$^ŋ$k] | /tag/ | 'my mother' |
| | [ˈ$^n$dzaŋ] | /zaŋ/ | 'yellow' |
| T | [ˈto] | /to/ | 'to drop' |
| | [ˈ$^n$dzoː] | /zoː/ | 'to tangle' |
| T | [pəˈtiː] | /ptiː/ | 'to spread' |
| | [ɓəˈ$^n$dzi] | /ɓzi/ | 'sew edge of string bag' |
| | [kəˈtuː] | /ktuː/ | 'joint' |
| | [həˈ$^n$dzun] | /hzun/ | 'to string' |
| /t/ and / $^n$d$^y$/ | [ˈto] | /to/ | 'to drop' |
| T | [ˈ$^n$d$^y$oŋ] | /d$^y$oŋ/ | 'banana' |
| T | [kəˈtuaʔ] | /ktuak/ | 'erect' |
| | [ɓəˈ$^n$d$^y$uɓa] | /ɓd$^y$uɓa/ | 'dust' |

| | | |
|---|---|---|
| [kə'tib] | /ktib/ | 'to hit' |
| [hə'ⁿdʸihi] | /hdʸihi/ | 'grubs' |

| | | | |
|---|---|---|---|
| /d/ and /ⁿdz/ | ['ⁿdo] | /do/ | 'to be' |
| | ['ⁿdzo:] | /zo:/ | 'to tangle' |
| T | ['ⁿdaᵐp] | /dab/ | 'seventh child' |
| | ['ⁿdzaŋ] | /zaŋ/ | 'yellow' |
| | [bə'ⁿdi:] | /bdi:/· | 'midday' |
| | [bə'ⁿdzi] | /bzi/ | 'sew edge of string bag' |
| T | [ŋə'ⁿdem] | /ŋdem/ | 'your cousin' |
| | [ŋə'ⁿdzem] | /ŋzem/ | 'type of tree' |

| | | | |
|---|---|---|---|
| /d/ and /ⁿdʸ/ | ['ⁿdoᵐp] | /dob/ | 'grass skirt' |
| T | ['ⁿdʸoŋ] | /dʸoŋ/ | 'banana' |
| T | ['ⁿdə'ⁿdihi] | /ddihi/ | 'slippery' |
| | [hə'ⁿdʸihi] | /hdʸihi/ | 'grubs' |
| | [bə'ⁿduᵐba?] | /bdubak/ | 'frog' |
| | [bə'ⁿdʸuba] | /bdʸuba/ | 'dust' |

| | | | |
|---|---|---|---|
| /ⁿdz/ and /ⁿdʸ/ | ['ⁿdzo:] | /zo:/ | 'to tangle' |
| T | ['ⁿdʸoŋ] | /dʸoŋ/ | 'banana' |
| T | [bə'ⁿdziⁿt] | /bzid/ | 'a feast' |
| | [hə'ⁿdʸihi] | /hdʸihi/ | 'grubs' |

|                          |                          |                |                           |
|--------------------------|--------------------------|----------------|---------------------------|
|                          | $[hə \cdot {}^{n}dzun]$  | /hzun/         | 'to string'               |
|                          | $[ɓə \cdot {}^{n}d^{y}uɓa]$ | /ɓd$^{y}$uɓa/ | 'dust'                  |
| /t$^{y}$/ and /$^{n}$dz/ | $[\cdot t^{y}a:]$        | /t$^{y}$a:/    | 'to scoop'                |
| T                        | $[\cdot {}^{n}dzaŋ]$     | /zaŋ/          | 'yellow'                  |
|                          | $[\cdot t^{y}ip]$        | /t$^{y}$ip/    | 'to come up'              |
|                          | $[\cdot {}^{n}dzilaʔ]$   | /zilak/        | 'type of tree'            |
|                          | $[ŋə \cdot t^{y}ihi]$    | /ŋt$^{y}$ihi/  | 'shrimp'                  |
|                          | $[ɓə \cdot {}^{n}dzi]$   | /ɓzi/          | 'sew edge of string bag'  |
| T                        | $[kə \cdot t^{y}ɛn]$     | /kt$^{y}$ɛn/   | 'edible palm'             |
|                          | $[ŋə \cdot {}^{n}dzem]$  | /ŋzem/         | 'type of tree'            |
| /t$^{y}$/ and /$^{n}$d$^{y}$/ | $[\cdot t^{y}uʔ]$   | /t$^{y}$uk/    | 'to call out'             |
| T                        | $[\cdot {}^{n}d^{y}oŋ]$  | /d$^{y}$oŋ/    | 'banana'                  |
|                          | $[kə \cdot t^{y}ɔ:$      | /kt$^{y}$ɔ:/   | 'to lie'                  |
|                          | $[ŋə \cdot {}^{n}d^{y}u]$ | /ŋd$^{y}$u/   | 'to fold arms'            |
| T                        | $[ŋə \cdot t^{y}ihi]$    | /ŋt$^{y}$ihi/  | 'shrimp'                  |
|                          | $[hə \cdot {}^{n}d^{y}ihi]$ | /hd$^{y}$ihi/ | 'grubs'                 |
| /h/  and /k/             | $[\cdot hu]$             | /hu/           | 'to sew'                  |
|                          | $[\cdot ku]$             | /ku/           | 'to tie'                  |
| T                        | $[\cdot hɛaʔ]$           | /hɛak/         | 'to groan'                |
|                          | $[\cdot kɛaʔ]$           | /kɛak/         | 'to talk'                 |

|   |   | [həˈluŋ] | /hluŋ/ | 'to show' |
|---|---|---|---|---|
|   |   | [kəˈluŋ] | /kluŋ/ | 'hat' |
|   | T | [ɓəˈhua] | /ɓhua/ | 'type of plant' |
|   |   | [kəˈkuaʔ] | /kkuak/ | 'bird' |
|   |   | [ɓəˈhɔl̪] | /ɓhɔl/ | 'a bow' |
|   |   | [səˈkɔm] | /skɔm/ | 'corn' |
|   | T | [ŋgʷaˈhɛlaʔ] | /gʷahɛlak/ | 'type of animal' |
|   |   | [kəˈkɛlaʔ] | /kkɛlak/ | 'crocodile' |
| /h/ and /ɟ/ | | [ˈhɛⁿt] | /hɛd/ | 'fifth daughter' |
|   | T | [ˈɟɛⁿt] | /ɟɛd/ | 'to have' |
|   |   | [ˈhi] | /hi/ | 'to hit' |
|   |   | [ˈɟi:] | /ɟi:/ | 'we two, exc.' |
|   |   | [ˈham] | /ham/ | 'to do intently' |
|   |   | [ˈɟam] | /ɟam/ | 'you plural' |
|   |   | [ɓəˈhɛɓa] | /ɓhɛɓa/ | 'yesterday' |
|   |   | [ɓəˈɟɛʔ] | /ɓɟɛk/ | 'string bag' |
|   |   | [ɓəˈhɔl̪] | /ɓhɔl/ | 'a bow' |
|   |   | [ɓəˈɟo:] | /ɓɟo:/ | 'type of tree' |
|   | T | [ɓəˈhaɟ] | /ɓhaɟ/ | 'type of tree' |
|   |   | [ɓəˈɟa] | /ɓɟa/ | 'his leg' |

| /h/ and /g/ | [ˈham] | /ham/ | 'to do intently' |
|---|---|---|---|
|  | [ˈⁿgam̥] | /gam/ | 'sibling-in-law' |
|  |  |  |  |
|  | [ˈhu] | /hu/ | 'to sew' |
|  | [ˈⁿguː] | /guː/ | 'fifth son' |
|  |  |  |  |
| T | [ˈhom] | /hom/ | 'to take' |
|  | [ˈⁿgoɬ̥] | /gol/ | 'to slice' |
|  |  |  |  |
| T | [ɓəˈtʃˈhɔɬ] | /ɓhɔl/ | 'a bow' |
|  | [ⁿdəˈtʃˈⁿgɔɬ̥] | /dgɔl/ | 'type of bird' |
|  |  |  |  |
|  | [ɓəˈhua] | /ɓhua/ | 'type of plant' |
|  | [ɓəˈⁿguⁿt] | /ɓgud/ | 'fire box' |
|  |  |  |  |
|  | [ɓəˈhaɟ] | /ɓhaɟ/ | 'type of tree' |
|  | [həˈⁿgaʔ] | /hgak/ | 'to be angry' |
|  |  |  |  |
| /ɟ/ and /k/ | [ˈɟɛn] | /ɟɛn/ | 'to have' |
| T | [ˈkɛn̥] | /kɛn/ | 'to carry' |
|  |  |  |  |
|  | [ˈɟumaʔ] | /ɟumak/ | 'house' |
|  | [ˈkunaʔ] | /kunak/ | 'angry' |
|  |  |  |  |
|  | [ɓəˈɟɛʔ] | /ɓɟɛk/ | 'string bag' |
|  | [pəˈkɛᵐp] | /pkɛb/ | 'beside of' |
|  |  |  |  |
| T | [ɓəˈɟoː] | /ɓɟoː/ | 'type of tree' |
|  | [pəˈkoː] | /pkoː/ | 'owl' |

| | | | |
|---|---|---|---|
| T | [ˈlɔɠ] | /lɔɠ/ | 'to build' |
| | [ˈlɔʔ] | /lɔk/ | 'to go' |
| | [ˈleɠ] | /leɠ/ | 'to rip' |
| | [ˈleʔ] | /lek/ | 'but' |
| /ɠ/ and /kʷ/ | [ˈɠa] | /ɠa/ | 'I eat' |
| T | [ˈkʷa] | /kʷa/ | 'his neck' |
| | [ˈɠep] | /ɠep/ | 'I sleep' |
| | [ˈkʷɛp] | /kʷɛp/ | 'dry' |
| | [ɓəˈɠɛʔ] | /ɓɠɛk/ | 'string bag' |
| | [təˈkʷe] | /tkʷe/ | 'old' |
| T | [ɓəˈɠa] | /ɓɠa/ | 'his leg' |
| | [pəˈkʷaː] | /pkʷaː/ | 'type of tree' |
| /ɠ/ and /g/ | [ˈɠa] | /ɠa/ | 'I eat' |
| | [ˈⁿga] | /ga/ | 'here' |
| T | [ˈɠɛn] | /ɠɛn/ | 'to have' |
| | [ˈⁿgɛn] | /gɛn/ | 'type of tree' |
| T | [ɓəˈɠɛʔ] | /ɓɠɛk/ | 'string bag' |
| | [ɓəˈⁿgeᵑk] | /ɓgeg/ | 'my arm' |
| | [ɓəˈɠune] | /ɓɠune/ | 'outside' |
| | [ɓəˈⁿgula] | /ɓɠula/ | 'coconut' |

| | | | |
|---|---|---|---|
| | [ˈtaɠ] | /tag/ | ˈto openˈ |
| | [ˈtaᵑk] | /tag/ | ˈmy motherˈ |
| T | [ˈnuɠ] | /nug/ | ˈto quitˈ |
| | [ˈnuᵑk] | /nug/ | ˈmy childˈ |

/ɠ/ and /gʷ/

| | | | |
|---|---|---|---|
| T | [ˈɠa] | /ɠa/ | ˈI eatˈ |
| | [ˈŋ̍gʷaː] | /gʷaː/ | ˈthird sonˈ |
| | [ˈɠep] | /ɠep/ | ˈI sleepˈ |
| | [ˈŋ̍gʷeᵐba] | /gʷeba/ | ˈtodayˈ |
| | [ˈɠiː] | /ɠiː/ | ˈwe two, exc.ˈ |
| | [ˈŋ̍gʷiᵐp] | /gʷib/ | ˈcassowaryˈ |
| T | [bəˈɠaᵑk] | /bɠag/ | ˈmy legˈ |
| | [təˈŋ̍gʷaᵑk] | /tgʷag/ | ˈtype of tree |
| | [bəˈɠɛʔ] | /bɠɛk/ | ˈstring bagˈ |
| | [maˈŋ̍gʷɛm] | /mgʷɛm/ | ˈtype of treeˈ |

/m/ and /mʷ/

| | | | |
|---|---|---|---|
| T | [ˈmɔn] | /mɔn/ | ˈyou threeˈ |
| | [ˈmʷɔʔ] | /mʷɔk/ | ˈto fall downˈ |
| T | [ˈːɔmˈeə] | /bmɔː/ | ˈtype of treeˈ |
| | [bəˈmʷɔ] | /bmʷɔ/ | ˈa spiritˈ |

/m/ and /mʸ/

| | | | |
|---|---|---|---|
| T | [ˈma] | /ma/ | ˈnegativeˈ |
| | [ˈmʸa] | /mʸa/ | ˈhis mouthˈ |

|  |  |  |  |
|---|---|---|---|
|  | [ˈmɛnaʔ] | /mɛnak/ | 'bird' |
|  | [ˈmʸɛ] | /mʸɛ/ | 'pandanus' |
| T | [ˈme] | /me/ | 'affirmative' |
|  | [ˈmʸel̩] | /mʸel/ | 'to cook' |
| /m/ and /b/ | [ˈmiⁿt] | /mid/ | 'type of tree' |
|  | [ˈᵐbin] | /bin/ | 'to wait for' |
| T | [ˈmuː] | /muː/ | 'you two' |
|  | [ˈᵐbuː] | /buː/ | 'crooked' |
|  | [ˈpɔmaʔ] | /pɔmak/ | 'white ash' |
|  | [ˈᵐboᵐbaʔ] | /bobak/ | 'correct' |
| T | [bəˈmɛaʔ] | /bmɛak/ | 'little fly' |
|  | [təˈᵐbɛaʔ] | /tbɛak/ | 'plenty' |
|  | [ˈtam] | /tam/ | 'your mother' |
|  | [ˈⁿdaᵐp] | /dab/ | 'seventh child' |
| T | [məˈsem] | /msem/ | 'good' |
|  | [kəˈseᵐp] | /kseb/ | 'to sneeze' |
| /m/ and /bʷ/ | [ˈmoʔ] | /mok/ | 'type of bamboo' |
| T | [ˈᵐbʷɔʔ] | /bʷɔk/ | 'pig' |
|  | [bəˈmɔː] | /bmɔː/ | 'type of tree' |
|  | [ŋgʷaˈᵐbʷɔŋk] | /gʷabʷɔg/ | 'type of bird' |

|  |  |  |  |
|---|---|---|---|
| T | [kə'mɔna] | /kmɔna/ | 'type of tree' |
|  | [bə·ᵐbʷɔyaʔ] | /bbʷɔyak/ | 'type of tree' |
| /mʷ/ and /bʷ/ | ['mʷɔʔ | /mʷɔk/ | 'to fall down' |
| T | ['ᵐbʷɔʔ] | /bʷɔk/ | 'pig' |
| T | [bə'mʷɔ] | /bmʷɔ/ | 'a spirit' |
|  | [bə·ᵐbʷɔyaʔ] | /bbʷɔyak/ | 'type of tree' |
| /mʷ/ and /b/ | ['mʷɔʔ] | /mʷɔk/ | 'to fall down' |
| T | ['ᵐbɔᵑk] | /bɔg/ | 'my home' |
| T | [bə'mʷɔ] | /bmʷɔ/ | 'a spirit' |
|  | ['kʷaᵐbɔ] | /kʷabɔ/ | 'close to' |
| /n/ and /d/ | ['neᵑk] | /neg/ | 'to have' |
|  | ['ⁿdeᵑk] | /deg/ | 'cooking pot' |
| T | ['niː] | /niː/ | 'second daughter' |
|  | ['ⁿdiː] | /diː/ | 'to tear down' |
| T | [kə'neᵑk] | /kneg/ | 'to ask' |
|  | [ŋə'ⁿdeᵑk] | /ŋdeg/ | 'my cousin' |
|  | ['linaʔ] | /linak/ | 'red ant' |
|  | ['yiⁿdaʔ] | /yidak/ | 'sickness' |
| T | ['kɛn] | /kɛn/ | 'to carry' |
|  | ['hɛⁿt] | /hɛd/ | 'fifth daughter' |

|  |  |  |  |
|---|---|---|---|
|  | [ˈɓun] | /ɓun/ | 'a ditch' |
|  | [ˈᵐbuⁿt] | /bud/ | 'type of tree' |
| /n/ and /nʸ/ T | [ˈnaŋ] | /naŋ/ | 'again' |
|  | [ˈnʸaŋ] | /nʸaŋ/ | 'taro' |
|  | [ˈnen] | /nen/ | 'to have' |
|  | [ˈnʸɛn] | /nʸɛn/ | 'flavorful' |
|  | [ɓəˈnuɟ] | /ɓnuɟ/ | 'to trip' |
|  | [ɓəˈnʸum] | /ɓnʸum/ | 'to wear' |
| T | [kəˈniŋ] | /kniŋ/ | 'medicine' |
|  | [həˈnʸiᵐp] | /hnʸib/ | 'type of fish' |
| /n/ and /ŋ/ | [ˈno] | /no/ | 'cook in bamboo' |
|  | [ˈŋo] | /ŋo/ | 'to hear' |
|  | [ˈnaŋ] | /naŋ/ | 'again' |
|  | [ˈŋaŋ] | /ŋaŋ/ | 'sak-sak' |
|  | [kəheⁿk] | /kneg/ | 'to ask' |
|  | [ˈluŋen] | /luŋen/ | 'to not know' |
|  | [ˈɓin] | /ɓin/ | 'to help' |
|  | [ˈɓiŋ] | /ɓiŋ/ | 'wall' |
| T | [həˈɓun] | /hɓun/ | 'to cover' |
|  | [həˈluŋ] | /hluŋ/ | 'to show' |

/n/  and /ŋʷ/    [ˈnaŋ]              /naŋ/           ꞌagainꞌ

                  [ˈŋ̩ʷaɟ]            /ŋʷaɟ/          ꞌfireꞌ

         T        [ˈnɛ]               /nɛ/            ꞌtake itꞌ

                  [ˈŋ̩ʷɛ]             /ŋʷɛ/           ꞌanotherꞌ

         T        [kəˈnɛŋk]           /knɛg/          ꞌto askꞌ

                  [ˈmaŋʷɛ]            /maŋʷɛ/        ꞌsomeꞌ

/nʸ/ and /ŋʷ/    [ˈnʸaŋ]            /nʸaŋ/         ꞌtaroꞌ

         T        [ˈŋʷaɟ]            /ŋʷaɟ/          ꞌfireꞌ

         T        [ˈnʸɛ:]            /nʸɛ:/          ꞌto grateꞌ

                  [ˈŋʷɛ]             /ŋʷɛ/           ꞌanotherꞌ

/nʸ/ and /ŋ/     [ˈnʸaŋ]            /nʸaŋ/         ꞌtaroꞌ

         T        [ˈŋaŋ]              /ŋaŋ/           ꞌsak-sakꞌ

         T        [ˈnʸɛ:]            /nʸɛ:/          ꞌto grateꞌ

                  [ˈŋɛ:]              /ŋɛ:/           ꞌyesꞌ

/ŋ/  and  /g/    [ˈŋa]               /ŋa/            ꞌto biteꞌ

                  [ˈⁿga]              /ga/            ꞌhereꞌ

         T        [ˈŋol̩]              /ŋol/           ꞌto rubꞌ

                  [ˈⁿgol̩]             /gol/           ꞌto sliceꞌ

         T        [ˈluŋen]            /luŋen/         ꞌto now knowꞌ

                  [bəˈⁿgeŋk]          /ɓgeg/          ꞌmy armꞌ

|  |  |  |  |
|---|---|---|---|
|  | [ⁿdeŋ] | /deŋ/ | 'type of tree' |
|  | [ⁿdeŋk] | /deg/ | 'cooking pot' |
| T | ['tuŋ] | /tuŋ/ | 'to close' |
|  | ['tuŋk] | /tug/ | 'to explode' |
| /ŋ/ and /gʷ/ | ['ŋaŋ] | /ŋaŋ/ | 'sak-sak' |
| T | ['ŋgʷaŋk] | /gʷag/ | 'type of animal' |
| T | ['ŋɛba] | /ŋɛba/ | 'type of animal' |
|  | ['ŋgʷeᵐba] | /gʷeba/ | 'today' |
|  | ['luŋen] | /luŋen/ | 'to not know' |
|  | [məˈŋgʷɛm] | /mgʷɛm/ | 'type of tree' |
| /ŋ/ and /ɟ/ | ['ŋa] | /ŋa/ | 'to bite' |
|  | ['ɟa] | /ɟa/ | 'I eat' |
| T | ['ŋon] | /ŋon/ | 'to swallow' |
|  | ['ɟon] | /ɟon/ | 'to sharpen' |
|  | ['luŋen] | /luŋen/ | 'to not know' |
|  | [bəˈɟɛʔ] | /bɟɛk/ | 'string bag' |
|  | ['naŋ] | /naŋ/ | 'again' |
|  | ['laɟ] | /laɟ/ | 'to go back' |
| T | [həˈluŋ] | /hluŋ/ | 'to show' |
|  | [bəˈluɟ] | /bluɟ/ | 'type of tree' |

| | | | |
|---|---|---|---|
| /ŋ/ and /ŋ$^w$/ | [ˈŋɛː] | /ŋɛː/ | 'yes' |
| T | [ˈŋ̣$^w$ɛ] | /ŋ$^w$ɛ/ | 'another' |
| T | [ˈŋaŋ] | /ŋaŋ/ | 'sak-sak' |
| | [ˈŋ̣$^w$aɠ] | /ŋ$^w$aɠ/ | 'fire' |
| T | [ˈluŋen] | /luŋen/ | 'to not know' |
| | [ˈmaŋ$^w$ɛ] | /maŋ$^w$ɛ/ | 'some' |
| /ŋ$^w$/ and /g/ | [ˈŋ̣$^w$aɠ] | /ŋ$^w$aɠ/ | 'fire' |
| T | [ˈⁿ̣gaŋ] | /gaŋ/ | 'to clang' |
| | [ˈŋ̣$^w$ɛ] | /ŋ$^w$ɛ/ | 'another' |
| | [ˈⁿ̣gɛm] | /gɛm/ | 'type of tree' |
| T | [ˈmaŋ$^w$ɛ] | /maŋ$^w$ɛ/ | 'some' |
| | [haˈⁿ̣gɛhɛ] | /hgɛhɛ/ | 'type of tree' |
| /ŋ$^w$/ and /g$^w$/ | [ˈŋ̣$^w$aɠ] | /ŋ$^w$aɠ/ | 'fire' |
| T | [ˈⁿ̣g$^w$aŋk] | /g$^w$ag/ | 'type of animal' |
| | [ˈŋ̣$^w$ɛ] | /ŋ$^w$ɛ/ | 'another' |
| | [ˈⁿ̣g$^w$eᵐba] | /g$^w$eba/ | 'today' |
| T | [ˈmaŋ$^w$ɛ] | /maŋ$^w$ɛ/ | 'some' |
| | [məˈⁿ̣g$^w$ɛm] | /mg$^w$ɛm/ | 'type of tree' |

## 4.2   Vowels

### 4.2.1   Work Chart

|          |          |
|----------|----------|
| i        | u        |
| e        | o        |
| ɛ        | ɔ        |
|          |          |

a

### 4.2.2   Description

/i/        [i]        Voiced high close front unrounded vocoid
                      occurs word initially, medially, and finally.
                      [ˈlihi]          /lihi/          ʼleafʼ

/e/        [e]        Voiced mid close front unrounded vocoid
                      occurs word initially, medially, and finally.
                      [ˈkʷel̪]          /kʷel/          ʼto scratchʼ

/ɛ/        [ɛ]        Voiced mid open front unrounded vocoid
                      occurs word medially and finally.
                      [ˈkɛhɛ]          /kɛhɛ/          ʼbaseʼ

/a/        [a]        Voiced low open central unrounded vocoid
                      occurs word initially, medially, and finally.
                      [ˈɓaᵐba]          /ɓaba/          ʼhow manyʼ

/u/        [u]        Voiced high close back rounded vocoid
                      occurs word initially, medially,and finally.
                      [həˈᵐbuhu]          / hbuhu/          ʼflatʼ

/o/        [o]        Voiced mid close back rounded vocoid
                      occurs word initially, medially, and finally.
                      [ˈɠoho]          /ɠoho/          ʼhorseʼ

/ɔ/          [ɔ]              Voiced low close back rounded vocoid occurs
                             word initially, medially, and finally.
                             [kə'tɔŋ]          /ktɔŋ/          'to read'

### 4.2.3  Contrasts of Vowel Phonemes

The vowel contrasts can be summarized as follows:

|            |            |            |            |
|------------|------------|------------|------------|
|            | ['lim]     | /lim/      | 'your sibling' |
|            | ['lem]     | /lem/      | 'your name' |
|            | ['lɛn]     | /lɛn/      | 'bone' |
|            | ['lam]     | /lam/      | 'to come' |
|            | ['lum]     | /lum/      | 'to do carefully' |
|            | ['lom]     | /lom/      | 'to return' |
|            | ['lɔɟ]     | /lɔɟ/      | 'to build' |

/i/  and  /e/     ['liⁿk]          /liɟ/          'my sibling'
   T              ['leⁿk]          /leɟ/          'my name'

                  ['yip]          /yip/          'your uncle'
                  ['yep]          /yep/          'he sleeps'

   T              ['me]           /me/           'affirmative'
                  ['mi]           /mi/           'to make practice of'

   T              [kə'tiɓ]        /ktiɓ/         'to hit'
                  [tə'teɓ]        /tteɓ/         'type of tree'

                  [pə'wil̰]        /pwil/         'to turn'
                  [lə'wel̰]        /lwel/         'type of animal'

|  |  |  |  |
|---|---|---|---|
|  | [kəˈⁿdi] | /kdi/ | 'to get up' |
|  | [ŋəˈⁿde] | /ŋde/ | 'his cousin' |
| /i/ and /ε/ T | [ˈpiʔ] | /pik/ | 'to make noise' |
|  | [ˈpεʔ] | /pεk/ | 'to break' |
|  | [ˈhi] | /hi/ | 'to hit' |
|  | [ˈhε] | /hε/ | 'they plural' |
|  | [ˈᵐbin] | /bin/ | 'to wait for' |
|  | [ˈᵐbεn] | /bεn/ | 'his home' |
| T | [həˈli:] | /hli:/ | 'to rub' |
|  | [həˈlε:] | /hlε/ | 'to sprinkle' |
| T | [kəˈlin] | /klin/ | 'sour' |
|  | [kəˈlεn] | /klεn/ | 'ashes' |
|  | [ˈɓihi] | /ɓihi/ | 'to carry' |
|  | [ˈɓεhε] | /ɓεhε/ | 'sibling-in-law' |
|  | [ˈɓiɓaʔ] | /ɓiɓak/ | 'to spin' |
|  | [ˈɓεɓaʔ] | /ɓεɓak/ | 'war' |
| /e/ and /ε/ T | [ˈǥe] | /ǥe/ | 'I see' |
|  | [ˈǥε] | /ǥε/ | 'we plural exc.' |
| T | [ˈɓel̪] | /ɓel/ | 'completely' |
|  | [ˈɓεl̪] | /ɓεl/ | 'big rock' |

|   |   |   |   |
|---|---|---|---|
|   | [ˈkʷel̜] | /kʷel/ | 'to scratch' |
|   | [ˈkʷɛm] | /kʷɛm/ | 'white' |
|   | [ˈleʔ] | /lek/ | 'but' |
|   | [ˈlɛʔ] | /lɛk/ | 'preposition' |
| T | [bəˈnem] | /ɓnem/ | 'your wife' |
|   | [bəˈnɛm] | /ɓnɛm/ | 'type of tree' |
|   | [ˈᵑgen] | /gen/ | 'yet' |
|   | [ˈᵑgɛn] | /gɛn/ | 'type of tree' |
|   | [ˈne] | /ne/ | 'location' |
|   | [ˈnɛ] | /nɛ/ | 'take it' |
| /ɛ/ and /a/ T | [ˈɟɛ] | /ɟɛ/ | 'we plural exc.' |
|   | [ˈɟa] | /ɟa/ | 'I eat' |
|   | [ˈɓɛl̜] | /ɓɛl/ | 'big rock' |
|   | [ˈɓal̜] | /ɓal/ | 'to return' |
|   | [ˈkɛhɛ] | /kɛhɛ/ | 'base' |
|   | [ˈpaha] | /paha/ | 'new' |
| T | [ˈkʷɛm] | /kʷɛm/ | 'white' |
|   | [ˈkʷam] | /kʷam/ | 'your neck' |
|   | [ˈnɛ] | /nɛ/ | 'take it' |
|   | [ˈna] | /na/ | 'where' |

|   |   |   |   |
|---|---|---|---|
| T | $[p\vartheta{}^{\!,}t^{y}\varepsilon p]$ | $/pt^{y}\varepsilon p/$ | 'to sweep' |
|   | $[p\vartheta{}^{\!,}tap]$ | $/ptap/$ | 'to clap' |

| /u/ and /o/ | $[{}^{\!,}mun]$ | $/mun/$ | 'rat' |
|---|---|---|---|
|   | $[{}^{\!,}mon]$ | $/mon/$ | 'second son' |
| T | $[\mathrm{b}\vartheta{}^{\!,}lu]$ | $/\mathrm{b}lu/$ | 'half' |
|   | $[\mathrm{b}\vartheta{}^{\!,}lo]$ | $/\mathrm{b}lo/$ | 'soot on pots' |
|   | $[{}^{\!,}\mathrm{g}uma\,?]$ | $/\mathrm{g}umak/$ | 'house' |
|   | $[{}^{\!,}\mathrm{g}ona\,?]$ | $/\mathrm{g}onak/$ | 'type of bamboo' |
| T | $[h\vartheta{}^{\!,}lu\eta]$ | $/hlu\eta/$ | 'to show' |
|   | $[h\vartheta{}^{\!,}lo^{\eta}k]$ | $/hlog/$ | 'type of tree' |
| T | $[{}^{\!,}\eta\dot{u}\underline{l}]$ | $/\eta ul/$ | 'to eat sugarcane' |
|   | $[{}^{\!,}\eta o\underline{l}]$ | $/\eta ol/$ | 'to rub' |
|   | $[{}^{\!,}nu]$ | $/nu/$ | 'his child' |
|   | $[{}^{\!,}no]$ | $/no/$ | 'to cook in bamboo' |

| /o/ and /ɔ/ | $[{}^{\!,}mon]$ | $/mon/$ | 'second son' |
|---|---|---|---|
| T | $[{}^{\!,}m\mathfrak{o}n]$ | $/m\mathfrak{o}n/$ | 'you three' |
| T | $[t\vartheta{}^{\!,}yo\!:]$ | $/tyo\!:/$ | 'to close' |
|   | $[t\vartheta{}^{\!,}y\mathfrak{o}\!:]$ | $/ty\mathfrak{o}\!:/$ | 'to repeat after' |
|   | $[{}^{\!,}yo^{\eta}k]$ | $/yog/$ | 'a division line' |
|   | $[{}^{\!,}y\mathfrak{o}^{\eta}k]$ | $/y\mathfrak{o}g/$ | 'my parent-in-law' |

|   |   |   |   |
|---|---|---|---|
| T | [ˈyoƀ] | /yoƀ/ | 'dry' |
|   | [ˈyɔƀ] | /yɔƀ/ | 'sugarcane' |
|   | [ˈɠonaʔ] | /ɠonak/ | 'type of bamboo' |
|   | [ˈɠɔna] | /ɠɔna/ | 'to fear' |
| T | [kəˈton] | /kton/ | 'mountain' |
|   | [kəˈtɔŋ] | /ktɔŋ/ | 'to read' |
| /ɔ/ and /a/ | [ˈyɔƀ] | /yɔƀ/ | 'sugarcane' |
|   | [ˈyaƀ] | /yaƀ/ | 'to rustle' |
| T | [ˈmɔn] | /mɔn/ | 'you three' |
|   | [ˈman] | /man/ | 'a file' |
| T | [ƀəˈyɔŋ] | /ƀyɔŋ/ | 'type of animal' |
|   | [ƀəˈyaŋ] | /ƀyaŋ/ | 'a sling' |
|   | [kəˈlɔŋ] | /klɔŋ/ | 'a container' |
|   | [ŋəˈlaŋ] | /ŋlaŋ/ | 'a fly' |
| T | [ˈkʷaᵐbɔ] | /kʷabɔ/ | 'close to' |
|   | [ˈƀaᵐba] | /ƀaba/ | 'how many' |
|   | [ˈɠɔm] | /ɠɔm/ | 'to possess' |
|   | [ˈɠam] | /ɠam/ | 'you plural' |
| /u/ and /ɔ/ | [ˈsuɠ] | /suɠ/ | 'to open' |
|   | [ˈsɔɠ] | /sɔɠ/ | 'to jump' |

| | | | |
|---|---|---|---|
| T | [ɪᵐbuᵑk] | /bug/ | 'my grandparent' |
| | [ɪᵐbɔᵑk] | /bɔg/ | 'my home' |
| T | [kəˈluŋ] | /kluŋ/ | 'hat' |
| | [kəˈlɔŋ] | /klɔŋ/ | 'a container' |
| | [ˈɠumaʔ] | /ɠumak/ | 'house' |
| | [ˈɠɔna] | /ɠɔna/ | 'to fear' |
| | [ɪᵐbuʔ] | /buk/ | 'day' |
| | [ɪᵐbʷɔʔ] | /bʷɔk/ | 'pig' |
| T | [ˈsu] | /su/ | 'to put in' |
| | [ˈsɔ] | /sɔ/ | 'incorrect' |
| /ɛ/ and /o/ | [ˈlɛn] | /lɛn/ | 'bone' |
| T | [ˈlon] | /lon/ | 'to roll' |
| | [ˈkɛhɛ] | /kɛhɛ/ | 'base' |
| | [ˈɠoho] | /ɠoho/ | 'horse' |
| | [ˈɠɛn] | /ɠɛn/ | 'we three exc.' |
| | [ˈɠon] | /ɠon/ | 'to file' |
| T | [ˈyɛɓ] | /yɛɓ/ | 'to dig' |
| | [ˈyoɓ] | /yoɓ/ | 'dry' |
| T | [ˈpɛᵐp] | /pɛb/ | 'steps' |
| | [ˈpoᵐp] | /pob/ | 'thigh' |

## 4.3  Suprasegmental Items

### 4.3.1.  Length

Length has only been found to contrast with its absence word finally.  So far length has not been observed in any other position.[5]  Short vowels are followed word finally by a voiceless vowel when words are spoken in isolation.  This voiceless release is dropped when words are spoken in context.

Some contrastive sets for lengthened vowels are:

| | | |
|---|---|---|
| $[\mathrm{{}^{\iota m}bu{:}}]$ | /bu:/ | 'crooked' |
| $[\mathrm{{}^{\iota m}bu}]$ | /bu/ | 'his grandparent' |
| $[\mathrm{{}^{\iota m}bu\textipa{P}}]$ | /buk/ | 'day |
| | | |
| $[\mathrm{bə^{\iota}nɔ{:}}]$ | /ɓnɔ:/ | 'to peel' |
| $[\mathrm{bə^{\iota}nɔ}]$ | /ɓnɔ/ | 'clay pieces' |
| | | |
| $[\mathrm{tə^{\iota}yi{:}}]$ | /tyi:/ | 'to carry' |
| $[\mathrm{tə^{\iota}yi}]$ | /tyi/ | 'enough' |
| | | |
| $[\mathrm{{}^{\iota}ɓe{:}}]$ | /ɓe:/ | 'larvae' |
| $[\mathrm{{}^{\iota}ɓe}]$ | /ɓe/ | 'plant shoots' |
| | | |
| $[\mathrm{kə^{\iota}ta{:}}]$ | /kta:/ | 'to plead' |
| $[\mathrm{kə^{\iota}t^{y}a}]$ | /kt$^{y}$a/ | 'to wipe' |

## 4.3.2  Intonation

The following intonation patterns have been observed:

(a)  Interrogative

(i)    [ tu? yep ]                    'Is the first born son
                                                     sleeping?'

[ oŋ gɔm kəluba? ⁿdo ]            'Do you have some sweet
                                                     potatoes?'

[ oŋ la yua? bəhɛbaⁿgɛ ]          'Did you go to the garden
                                                     yesterday?'

[ oŋ we ᵐbʷɔ? we bal ⁿgɛ ]        'Did you see the pig that
                                                     came?'


(ii)   [ oŋ ᵐbəla na ]             'Where are you going?'

[ hɛ ya ba ]                      'What are they eating?'

[ kəpʷɔ? ᵐbɛ? bal yɛla?na ]       'When is the old man coming?'

(b)  Declarative

(i)    Positive

[ ŋɛ ]                            'Yes.'

[ ŋɛ tu? yep ɔ ]                  'Yes, the first born son
                                                is sleeping.'

[ a ge ᵐbʷɔ? we bal ⁿgɛ ]         'I saw the pig that came.'

[ a ᵐbəla ŋ ag ]                  'I am going to get firewood.'

[ ɔ ᵐbɛ? bal lɛ? yua?yu ]         'He will come on Tuesday.'

(ii)   Negative

$$\left[\ \overline{\text{a laen }\overbrace{\text{yua? ma}}}\ \right]$$       'I didn't go to the
                                                                                     garden.'

$$\left[\ \text{ma}\ \overline{\overbrace{\text{tu? yeen ma}}}\ \right]$$       'No, the first born son
                                                                                     isn't sleeping.'

$$\left[\ ^{m}\text{b}\varepsilon\ \right]$$                                    'Maybe.'


(iii)  Complex

$$\left[\ \overline{\overbrace{\text{oŋ }^{m}\text{bɛ? nel i sɔ}}}\ \overbrace{\text{o}^{n}\text{t a }^{m}\text{bɛ? nel }^{m}\text{bo}^{m}\text{ba?}}\ \right]$$

'If you say it incorrectly, then I
will say it correctly.'

$$\left[\ \overline{\overbrace{\text{lun }^{m}\text{bɛ? bal}}}\ \text{a }^{m}\text{bə}^{n}\text{do }^{ŋ}\text{ga}\ \right]$$

'If it rains, I will stay here.'


(c)   Imperative

$$\left[\ \text{mu lɔ?ɛ}\ \right]$$                  'You two go!'

$$\left[\ \overline{\overbrace{\text{hien nɔ: ma}}}\ \right]$$   'Don't hit the dog!'

$$\left[\ \overline{\overbrace{\text{lɔ? hom kəpiha? lam}}}\ \right]$$   'Go bring the book!'


# 5   NON-CONTRASTIVE FEATURES

## 5.1   Transitional Vocoid

The vocoid ə occurs as a transition between consonants.
It is not phonemic since it can be predicted to occur whenever
two consonants come together within a word or across word
boundaries.[6]

| | | |
|---|---|---|
| [hə'luŋ] | /hluŋ/ | 'to show' |
| [tə'ⁿdi] | /tdi/ | 'to turn' |
| [lunəbal] | /lun bal/ | 'rain comes' |
| [bugəti] | /bug ti/ | 'one man' |

In some environments this transitional vocoid may fluctuate with
a vocoid which has more the phonetic quality of [ɛ]. Some of
these occurrences are when the following vowel is [i], [u], or
[e] or other environments which would tend to raise or front the
transitional vocoid.

| | | | |
|---|---|---|---|
| [bə'yeb] | ~ [bɛ'yeb] | /byeb/ | 'type of snake' |
| [hə'ⁿdʸihi] | ~ [hɛ'ⁿdʸihi] | /hdʸihi/ | 'larvae' |
| [bə'yoᵐp] | ~ [bɛ'yoᵐp] | /byob/ | 'cloud' |
| [mə'sem] | ~ [mɛ'sem] | /msem/ | 'good' |

## 5.2 Stress

Stress is non-phonemic since it occurs on the first syllable
of words. With the occurrence of the transitional vocoid [ə],
phonetically the stress comes on the second syllable, but
phonemically it is only one syllable.

| | | |
|---|---|---|
| [kə'luba?] | /klubak/ | 'sweet potato' |
| [tə'ᵐbi:] | /tbi:/ | 'an outsider' |

Words of two or more syllables may have secondary stress
on the final syllable, and in many of these cases the words can
be identified as compound words.

[ˈŋʷagə'lu]        /ŋʷaglu/           'smoke'
          from [ˈŋʷag]   'fire'  and  [ˈlu]    'smoke'

[ˈmaⁿk ə'non]     /magnon/           'forehead'

[bə'luᵐpə'kɔ:]    /blubkɔ:/          'rainbow'
          from [bə'luᵐp]   'snake'  and  [ˈkɔ:]   'web'

6   DISTRIBUTION

6.1   General

The basis for distribution is taken as the syllable, which in Patep consists of a single vowel as nucleus with optional onset and/or coda - (C) (C) V (C).  The following syllable types occur:

| | | |
|---|---|---|
| V | /a/ | 'I, me' |
| CV | /ti/ | 'one' |
| CCV | /nlu/ | 'his nose' |
| VC | /oŋ/ | 'you' |
| CVC | /lun/ | 'rain' |
| CCVC | /klin/ | 'sour' |

Syllables have been found to combine to form words in the following combinations:

| | | |
|---|---|---|
| V.CV | /i.la/ | 'before, ago' |
| V.CVC | /i.ɓak/ | 'blanket' |
| V.VC | /i.ak/ | 'type of tree' |
| | | |
| CV.CV | /lo.ma/ | 'inside' |
| CV.V | /mi.a/ | 'water' |
| CV.VC | /bɛ.ak/ | 'fish' |
| CV.CVC | /ɠu.mak/ | 'house' |
| CV.CCV | /ni.ɓha/ | 'good' |
| CV.CCVC | /ma.ptɔk/ | 'dark' |
| | | |
| CVC.VC | /luŋ.en/ | 'to not know' |
| CVC.CV | /ɠɔm.ɠɔ/ | 'people' |
| CVC.CVC | /luɓ.seŋ/ | 'bee' |

| CCV.V | /ptu.a/ | 'star' |
| CCV.VC | /ɓli.ak/ | 'black' |
| CCV.CVC | /pya.non/ | 'pau-pau' |
| CCV.CV | /kli.pi/ | 'pencil' |
| | | |
| CCVC.VC | /ptal.en/ | 'rotten' |
| CCVC.CV | /ktuk.ma/ | 'meeting' |
| | | |
| CV.CV.CV | /ma.gu.ɓa/ | 'type of bird' |
| CV.VC.V | /mi.ɛl.o/ | 'type of snake' |
| CV.CV.VC | /ni.ŋɛ.ak/ | 'dirty' |

The CV syllable pattern occurs word initially, medially, and finally.

| /lo.ma/ | 'inside' |
| /ma.gu.ɓa/ | 'type of bird' |
| /ni.ta/ | 'grass' |

The V, CVC, CCV, and CCVC syllable patterns occur word initially and finally.

| V | /i.ɓak/ | 'blanket' |
| | /mi.a/ | 'water' |
| | | |
| CVC | /luŋ.en/ | 'to not know' |
| | /ple.pak/ | 'to turn' |
| | | |
| CCV | /ptu.a/ | 'star' |
| | /ni.ɓha/ | 'good' |
| | | |
| CCVC | /ptal.en/ | 'rotten' |
| | /ma.ptɔk/ | 'dark' |

The VC syllable pattern occurs word medially and finally.

$$/mi.\underline{\varepsilon l}.o/ \qquad \text{'type of snake'}$$
$$/b\varepsilon.\underline{ak}/ \qquad \text{'fish'}$$

Words of more than two syllables are infrequent and are often compound words. For that reason, most of the syllable types occur only word initially and finally.


## 6.2   Specific

## 6.2.1   Vowels

Vowel phonemes occur in syllables according to the following pattern:

$V_2$

$CV_1$

$V_1C$

$CV_1C$

$CCV_1$

$CCV_1C$

$V_1$ -- all vowels

$V_2$ -- /i/, /u/, /a/


## 6.2.2   Consonants

Different sets of consonant phonemes occur in each of the consonant positions in the various syllable types. Some of this may be simply due to limited data. The following generalizations are true:

CV            all consonants except $/p^y/$ occur.

CVC           Initially:  all consonants except $/p^w/$ occur.

              Finally:  no labialized or palatalized consonants, or /s/, /z/, /w/, or /y/ occur.

VC              only /d/ /k/ /m/ /n/ /ŋ/ and /l/ have been
                found to occur.


CCV             Initially:  /p/ /t/ /k/ /b/ /d/ /h/ /ɓ/ /m/
                            /n/ /ŋ/ /l/ occur.

                Second C:  all of the above plus /t$^y$/ /k$^w$/
                           /d$^y$/ /g/ /s/ /z/ /ɟ/ /m$^w$/ /n$^y$/
                           /w/ /y/ occur.


CCVC            Initially:  /p/ /t/ /k/ /g/ /s/ /h/ /ɓ/ /m/
                            /n/ /ŋ/ /l/ occur.

                Second C:  all of the above plus /p$^w$/ /t$^y$/.
                           /b/ /d/ /z/ /ɟ/ /n$^y$/ /w/ /y/ occur.

                Finally:  /p/ /k/ /b/ /d/ /g/ /ɓ/ /ɟ/ /m/
                          /n/ /ŋ/ /l/ occur.


It is hoped that additional data will make it possible
to make a simpler statement about the occurrence of consonant
phonemes.

7  ORTHOGRAPHY

7.1  Proposed Orthography

| Phonemes | Phones | Orthography | Jabêm |
|----------|--------|-------------|-------|
| /p/ | [p] | p | p |
| /p$^y$/ | [p$^y$] | pi | |
| /p$^w$/ | [p$^w$] | pu | |
| /b/ | [$^m$b] [$^m$p] | b | b |
| /b$^y$/ | [$^m$b$^y$] | bi | |
| /b$^w$/ | [$^m$b$^w$] | bu | |
| /t/ | [t] | t | t |
| /t$^y$/ | [t$^y$] | ti | |
| /d/ | [d] | d | d |
| /d$^y$/ | [$^n$d$^y$] | di | |
| /k/ | [ḳ] | k | k |
| | [ʔ] | k or c | c |
| /k$^w$/ | [ḳ$^w$] | ku | |
| /g/ | [ŋ̣g] [ŋ̣k] | g | g |
| /g$^w$/ | [ŋ̣g$^w$] | gu | |
| /s/ | [s] | s | s |
| /h/ | [h] | h | h |
| /ɓ/ | [ɓ] | v | |
| /ɓ$^y$/ | [ɓ$^y$] | vi | |
| /z/ | [$^n$dz] | z | |
| /ɟ̣/ | [ɟ̣] | x | |
| /m/ | [m] | m | m |
| /m$^y$/ | [m$^y$] | mi | |
| /m$^w$/ | [m$^w$] | mu | |
| /n/ | [n] | n | n |
| /n$^y$/ | [n$^y$] | ni | |

| Phonemes | Phones | Orthography | Jabêm |
|----------|--------|-------------|-------|
| /ŋ/ | [ŋ̣] | ŋ | ŋ |
| /ŋʷ/ | [ŋ̣ʷ] | ŋu | |
| /l/ | [l] [ɫ] | l | l |
| /w/ | [w̟] | w | |
| /y/ | [y] | y | |
| /i/ | [i̠] | i | i |
| /e/ | [e] | ê | ê |
| /ɛ/ | [ɛ] | e | e |
| /a/ | [a] | a | a |
| /u/ | [u] | u | u |
| /o/ | [o] | ô | ô |
| /ɔ/ | [ɔ] | o | o |
| /iː/ | [iː] | ii | |
| /eː/ | [eː] | êê | |
| /ɛː/ | [ɛː] | ee | |
| /aː/ | [aː] | aa | |
| /uː/ | [uː] | uu | |
| /oː/ | [oː] | ôô | |
| /ɔː/ | [ɔː] | oo | |

We have chosen to write labialization and palatalization with u̱
and i̱ because of the occurrence of the transitional vocoid [ə] between
consonants.  If the labialization and palatalization were written with
w̱ and y̱, there would be confusion in the following sorts of word
pairs:

|  |  |  |
|---|---|---|
| ['nʸu:] | /nʸu:/ | 'to warm oneself' |
| [nə'yu:] | /nyu:/ | 'green' |

Both of these pairs would be written as nyuu and readers would not
know if the combinations of consonant plus y̱ or w̱ were consonant clus-
ters or labialization or palatalization of a consonant.

Since there are pairs of words like ['mi.a] 'water' and ['mʸa]
'his mouth', /i/ and /u/ followed by another vowel will be written as
iy̱ and uw̱ respectively.

Some sample words are:

|  |  |  |
|---|---|---|
| ['nʸu:] | niuu | 'to warm oneself' |
| [nə'yu:] | nyuu | 'green' |
| ['mʸa] | mia | 'his mouth' |
| ['mia] | miya | 'water' |

Because of the strong influence of Jabêm in the Patep area, we
are uncertain whether the symbol ḵ will be accepted for glottal stop.
It would be advantageous to use ḵ, since a close dialect has final ḵ
where Patep has glottal stop.  Our informant's reaction is that it is
incorrect to write the glottal stop with the symbol ḵ, but we will
need to get the reaction of other readers before deciding.

## 7.2   English Words as Pronounced by Vernacular Speakers

| | |
|---|---|
| 'bridge' | [$^m$bə'lis] |
| 'blue' | [$^m$bə'lu] |
| 'raincoat' | ['kotə'len] |
| 'coffee' | ['kɔpi] |
| 'rope' | ['lɔp] |
| 'razor' | ['lesa] |
| 'school' | [sə'kul] |
| 'spoon' | [sə'pun] |
| 'bed' | ['$^m$bɛt] |
| 'trousers' | [tə'lausɪs] |
| 'sugar' | ['suk$^w$a] |
| 'wire' | ['wa$^i$ə] |
| 'rice' | ['la$^i$s] |
| 'guitar' | ['$^ŋ$gita] |
| 'radio' | ['le$^n$dio] |
| 'lamp' | ['lam] |
| 'chisel' | ['sɪsɛl] |

## 7.3  Text

Phonetic transcription:    a $^{m}$pə    nel    kəyaŋ  we  ta$^{ŋ}$k

Orthographic transcription: a b    nêl    kyaŋ  wê  tag

Literal translation:    I fut.tense to.talk talk  that my.mother

P: yu: ma$^{ŋ}$k      yi$^{m}$p $^{n}$d a nip$^{w}$ɔ $^{ŋ}$gɛ. ta$^{ŋ}$k      yu: ma$^{ŋ}$k

O: yuu mag      yib d a nipuo ge. tag      yuu mag

L: and my.father died and I little there my.mother and my.father

P: yi$^{m}$p $^{n}$dɛʔ a mi   $^{n}$do nip$^{w}$ɔ me$^{n}$deʔ $^{m}$bu$^{ŋ}$k      ko a mɛʔ

O: yib dek a mi   do nipuo mêdêk bug      kô a mek

L: died and I habit to.be little so.then my.grandmother took me and

P: gi:   lam timəni me.   gi:   lam mi $^{n}$do timəni me$^{n}$deʔ

O: xii   lam Timini mê.   xii   lam mi dô Timini mêdêk

L: we.two came Timini affirm we.two came habit to.be Timini and.then

P: $^{m}$bu$^{ŋ}$k      boŋ yi$^{n}$daʔ me$^{n}$dɛʔ yi$^{m}$p me.   yi$^{m}$p

O: bug      vôŋ yidak mêdek yib mê.   yib

L: my.grandmother gave sickness and.then died affirm died

P: me$^{n}$dɛʔ a mi   gep baʔ $^{m}$bu$^{ŋ}$k      nə$^{m}$bu me$^{n}$deʔ a

O: mêdek a mi   xep vak bug      nbu mêdêk a

L: and.then I habit sleep in  my.grandmother chest and.then I

P: sɔ   na a ne$^{m}$be me$^{n}$t $^{m}$bu$^{ŋ}$k      ge: $^{n}$do mabəha memɛ

O: so   na a nêbê mêd bug      xêê dô mavaha même

L: incorrect ? I said so  my.grandmother still to.be alive so

P: a mi   gep həgon $^{m}$bu$^{ŋ}$k      we yi$^{m}$p $^{ŋ}$gɛ me. $^{n}$də gi:

O: a mi   xep hxôn bug      wê yib ge mê. d xii

L: I habit sleep with  my.grandmother that died there affirm and we.two

P: mi $^n$do me$^n$de? lo$^{\eta}$kəge ɓoŋ kəyaŋ la ɓɔləɓayi memɛ?

O: mi dô mêdêk Lôgxê vôŋ kyaŋ la Volvayi mêmek

L: habit to.be and.then language.group give talk go Volvayi so


P: ta$^{\eta}$k yɔn yi? yu: lam timəni me$^n$de? ɓal ko a

O: tag yon yik yuu lam Timini mêdêk val kô a

L: my.aunt and my.uncle they.two came Timini so came took me


P: me$^n$dɛ? gɛ la ɓɔləɓayi me. $^{\eta}$gɛ a nip$^w$ɔ memɛ? a

O: mêdek xe la Volvayi mê. ge a nipuo mêmek a

L: and.then we.pl. went Volvayi affirm there I small so I


P: gɔboen tə$^m$bɛa? ma $^n$dɛ? a gɔbo m$^y$a$^m$bɔ lɛ: t$^y$a $^{\eta}$gɛ we a

O: xovoen tbeak ma dek a xovô miabo lee tia ge wê a

L: know.neg much neg and I know short ? ? there that I


P: nel me.

O: nêl mê.

L: say affirm


Free Translation:

'I will talk about my mother and my father dying when I was little. My mother and my father died and I was very young so my grandmother took me and we went to the village of Timini. We went and stayed at Timini, but then my grandmother got sick and died. She died and I always slept close to my grandmother. I thought incorrectly that my grandmother was still alive, so I kept lying next to my dead grand-mother. We two stayed there, and then the people of Timini sent a message to Volvayi. My aunt and two of my uncles came to Timini. They came and got me and then we went to Volvayi. I was very little, so I don't remember very much, and I just know a short amount which I have spoken.'

ABBREVIATIONS

affirm      affirmative

fut         future

neg         negative

pl          plural

NOTES

1.  See the unpublished dissertation by Bruce A. Hooley, 1970. "Mapos
    Buang - Territory of New Guinea", University of Pennsylvania,
    pp. 31-33.

2.  There is fluctuation between palatalization and non-palatalization
    preceding the vowel /e/.

3.  The phoneme /g/ tends to go to the voiceless phone [x] in some
    speakers at the end of words and utterances.

4.  T indicates that these examples have been tape recorded.

5.  Length has been found to occur word medially when certain suffixes
    are added to words with final lengthened vowels.

    /pu:/            'up'

    /-ne/            'location marker'

    /pu:ne/          'up there'

    /hu:/            'to be ripe'

    /-en/            'adjectivizer'

    /hu:en/          'ripe'

6.  The following are cases in which there is no transitional [ə]
    between words:

    (a)  following glottal stop

         /gumak loma/        [gumaʔ loma]        'inside the house'

    (b)  geminate consonants

         /boŋ ŋʷɛ/           [boŋʷɛ]             'give another one'

    (c)  /ŋ/ followed by /g/ becomes [ŋg]

         /tuŋ gumak/         [tuŋgumaʔ]          'close the door'

ADDENDA

Since the writing of this paper, the following changes have been made in the proposed orthography:

| Phonemes | New Symbols |
|---|---|
| ${}^{m}_{b}{}^{w}$ | bw |
| ${}^{m}_{b}{}^{y}$ | by |
| $p^{w}$ | pw |
| $p^{y}$ | py |
| $t^{y}$ | ty |
| $k̇^{w}$ | kw |
| $ŋ̇ġ^{w}$ | gw |
| $ɓ^{y}$ | vy |
| $m^{w}$ | mw |
| $m^{y}$ | my |
| $n^{y}$ | ny |
| $ŋ̇$ | ng |
| $ŋ̇^{w}$ | ngw |
| $ə$ | i̵ |

These changes were made on the basis of results of psycholinguistic testing and discussion with literate Patep men. Approximately 20 men and women, literate in Pidgin English, were tested to see if and how they would write [ə], which we had analysed as non-phonemic. The results showed that about half of the people usually omitted writing it and the other half wrote a variety of symbols for it (some wrote ê̱, some harmonized it with the following vowel, and several were inconsistent).

At a meeting with a number of the literate men, it became appar-

ent·that there was a strong preference for writing palatalized and
labialized sound with y and w rather than i and u.  However, this
would produce confusion if [ə] showed no strong reason for not writing
it.  We have begun using the symbol ɨ and it seems to be well accepted
by the Patep readers.

Under the original proposed orthography we had to write /ŋ/ as ŋ
since ng initially would be read as [nə'h].  However, since [ə] is now
being written we have begun using ng which seems preferable since it
is the same as Pidgin.