The approximately 25 dialects of Bidayuh (Land Dayak) spoken in Sarawak, Malaysia, can be grouped into four clusters of generally intelligible dialects: Eastern, Central, Highland and Western.

In both the ultima and penult of the word, there are differences of vowel duration that create contrasting rhythm patterns. Each of the six vowels in the ultima can occur as normal or as lengthened. In the penult only four vowels occur. In most dialects there are two types of penult vowels, full and reduced. A full penult vowel is sustained and has consistent quality. Although no single phonetic feature is present in every instance of a reduced vowel, a reduced vowel frequently is brief, has lax articulation and lengthens a following consonant. In certain environments a reduced vowel is deleted entirely.

The lengthened vowels in the ultima have at least two historical sources: 1) Some lengthened vowels in Central Bidayuh have developed where a medial *h of Proto Bidayuh has dropped out. 2) Some lengthened vowels descended from Proto Bidayuh lengthened vowels have developed where an Austronesian (or Malayo-Polynesian) medial laryngeal has dropped out.

The full vs. reduced vowel contrast in the penult seems to be related to differences in accentual pattern in some other AN languages and apparently has developed from accentual differences at an early stage.

1. Introduction

Bidayuh, a Land Dayak language, is a network of dialects spoken in the inland sections of the Kuching and Samarahan Divisions in southwestern Sarawak. The approximately 25 dialects can be grouped into four clusters of generally intelligible dialects: Eastern Bidayuh (Bukar-Sadung), Central (Biatah-Penrissen-Lower Padawan), Highland (Tringgus-Sembaan-Upper Padawan) and Western (Singai-Jagoi).

In addition to Bidayuh the Land Dayak family of languages includes both the rather closely-related Bakati’ group and a number of other languages spoken farther south in West Kalimantan.

* The author wishes to acknowledge the leaders of the Bidayuh Language Development Project for their facilitating and encouraging the collection of the Bidayuh language data that forms the basis for this analysis as well as dozens of Bidayuh friends who have generously devoted hours to answering many questions about their variety of Bidayuh.

1 The dialect groups correspond roughly to political districts (Eastern to Serian District, Central to Kuching District and Western to Bau District), but the Highland dialects are spoken in highland areas of both Kuching and Bau Districts.
2. Rhythm differences

Bidayuh stems are typically disyllabic. Stress falls on the ultima of the Bidayuh word, at least in isolation.

In both the ultima and the penult there are differences of vowel duration that create contrasting rhythm patterns. The longer (L) and shorter (S) vowels in both ultima and penult occur in all four possible combinations: S-S, L-S, S-L, L-L. Consider the following examples from the Tringgus Bireng (Highland) and Tebakang (Eastern) dialects:

<table>
<thead>
<tr>
<th>Tringgus Bireng</th>
<th>Tebakang</th>
</tr>
</thead>
<tbody>
<tr>
<td>sükun² ‘elbow’</td>
<td>kābəs ‘dead’</td>
</tr>
<tr>
<td>pükut ‘punch (someone)’</td>
<td>kābət ‘tie (impv.)’</td>
</tr>
<tr>
<td>būkoʔ ‘parang, bush knife’</td>
<td>mābər ‘fly (verb)’</td>
</tr>
<tr>
<td>sūkan ‘hide’</td>
<td>tābir ‘wall’</td>
</tr>
</tbody>
</table>

2.1 Vowels of the ultima

In the ultima there are six vowel qualities: high i, u; central ə; mid e, o; low a. In nearly half the dialects the mid vowels are pronounced as centralizing diphthongs, [ia/ıə] and [ua/ʊə];

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² The consonants of Bidayuh are voiceless stops p, t, c (contrastive in Eastern dialects only), k; voiced stops b, d, j, g; nasals m, n, ŋ, η; liquids r, l (contrastive in Eastern dialects only); semivowels w, y; fricative s; laryngeals ?, h.
elsewhere they are pronounced as [e/e] and [o/o]. The central vowel is pronounced as [i] except in the Jagoi, Penrissen and Lower Padawan dialects, where it has a more retracted pronunciation, [?]  

Each of the six vowels in the ultima can occur as normal (V) or as lengthened (V:)\(^3\) although the mid and low vowels are lengthened more commonly than the others. In some dialects it is difficult to be sure whether the contrast occurs with all the vowels. Curiously, it appears that the Tringgus Raya (Highland) dialect has no length contrast in final syllables even though the other Highland dialects do.

Bunan (Eastern) \(tu\?am\), Biatah (Central) \(tu\?am\), Sembaan (Highland) \(tu\?am\), [Serambu (Western) \(tu\?am\)] ‘primary forest’.

Tebakang (Eastern) \(si\?on\), Biatah (Central) \(si\?on\), Tringgus Bireng (Highland) \(si\?on\), [Singai (Western) \(si\?on\)] ‘sheath for a bush knife’.

2.2 Vowels of the penult

In the penult there are four vowel qualities: high i, u;\(^4\) central \(\sigma\); low a. The mid vowels e and o do not occur contrastively in the penult.

It is worth noting in passing that the antepenult in Bidayuh has just one vowel i,\(^6\) which does not seem to exhibit either the lengthening found in the ultima or the full/reduced difference found in the penult.

In Eastern, Central and Highland (but not Western) dialects there are two types of penult vowels, full (V) and reduced (V̄).

Tebakang (Eastern) \(b\?uh\),\(^7\) Biatah (Central) \(b\?uh\), Tringgus Raya (Highland) \(b\?uh\), [Serambu (Western) \(b\?uh\)] ‘new’

Tebakang (Eastern) \(b\?uh\), Biatah (Central) \(b\?uh\), Tringgus Raya (Highland) \(b\?uh\), [Singai (Western) \(b\?uh\)] ‘eagle’

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\(^3\) In Western Bidayuh vowels may be rearticulated, i.e., there are sequences of identical (or diverse) vowels with the onset of the second vowel marked by an articulatory pulse coinciding with the onset of stress. For example, Gumbang (Western) [ta.'as] ‘ironwood’, [ti.'i?] ‘itchy’. These are sequences of vowels that form the nucleus of successive syllables. Western Bidayuh does not have lengthened vowels in the usual sense.

\(^4\) As penult vowels i and u can vary in some dialects to e and o, respectively, especially when the vowel of the ultima is e or o.

\(^5\) The mid vowel \(\sigma\) (in non-Western dialects) is more restricted than the other vowels in its occurrence in that it may occur in the penult only if the vowel of the ultima is also a mid vowel, e.g., Bukar (Eastern), Biatah (Central) \(t\?ap\), Tringgus Raya (Highland) \(t\?ap\) ‘deep’; Bukar (Eastern), Biatah (Central) \(b\?ay\), Tringgus Bireng \(b\?ay\) (Highland) ‘round’.

\(^6\) The other Land Dayak languages also have just one vowel that occurs in the antepenult, but in the Bakati’ languages and some others farther south it is a low vowel, a, rather than i.

\(^7\) A medial ? is regularly deleted in Tebakang following a full vowel (but not a reduced vowel) in sequences of diverse vowels.
Tebakang (Eastern) *mūkut*, Benuk (Central) *mūkut*, Sembaan (Highland) *mūkut*, [Singai (Western) *bukut*] ‘punch (vb.)’

Tebakang (Eastern) *būko?:*, Benuk (Central) *būko?:*, Tringgus Bireng (Highland) *būko?:*, [Singai (Western) *buko?*] ‘bush knife’

A full penult vowel has normal duration and is sustainable, with consistent vowel quality. Although there is no single phonetic feature that is present in every instance of a reduced penult vowel, the following features most commonly characterize this type of vowel:

- quick articulation that is not sustainable
- lengthening of a following consonant; cf. Tringgus Bireng /sūkūl/ [sukːu] ‘elbow’
- deletion, in at least some utterances, especially between a stop and a liquid or between s and a stop or nasal; cf. /tūraŋ/ > Benuk /traŋ/ [traŋ] ‘bone’; /sīpoːᵗ/ > Sembaan /spōt/ [spot] ‘blowpipe’, /sīnɔːd/ > Benuk /snɔːd/ [snuːd] ‘comb’
- lowering of high vowels; e.g., i > e, u > o, cf. Tebakang /jīlelh/ [jelːeh] ‘tongue’, Tebakang /tūloːʔ/ [toloʔ] ‘egg’
- exchange of vowel quality, especially among high vowels; e.g., i > u, u > i, u > ɔ, cf. /sīkūh/ > Anah Rais /sīkūh, /sīkuːh ‘elbow’, /sūdeʔ/ > Tringgus Raya /sīdeʔ/ ‘younger sibling’, /mūrib/ > Tringgus Raya /mʊrib/ ‘to fly’

The predominant canonical pattern in Bidayuh stems is CVNCVC\(^8\). Each of the consonant positions is optional. That is, the penult may have no initial consonant, and there may be no medial consonant. If the penult is closed by N, it must be followed by an initial consonant in the ultima. The ultima may have no closing consonant.

The contrast between full and reduced penult vowels is neutralized in the patterns CVVC and CVhVC\(^9\).

When there is no following consonant, the penult vowel is full.

Anah Rais and Biya (Highland) *niap* ‘count’

Biya (Highland), Tebakang (Eastern) *ūi* ‘rattan’

Biatah (Central), Tringgus Raya (Highland), Sadong (Eastern) *māin* ‘play’

Tebakang (Eastern) *käiʔ* ‘negative’

When the medial consonant is h, the penult vowel is reduced.

Tringgus Bireng (Highland) *diheh*, Tebakang (Eastern) *dihan* ‘durian’

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\(^8\) C = consonant, V = vowel, N = nasal of the same place of articulation as the following consonant.

\(^9\) Although a similar neutralization might be expected in CV?VC sequences, the contrast between full and reduced vowels does in fact operate in that environment. For example, Biatah (Central), Tringgus Raya (Highland) and Bukar (Eastern) *bāʔuh* ‘new’, Biatah (Central), Tringgus Raya (Highland) and Bukar (Eastern) *bāʔuh* ‘eagle’.
Tringgus Raya (Highland) *bāhit, Tebakang (Eastern) *ku māhit ‘left (hand)’
Tringgus Raya (Highland), Bukar (Eastern) *tihi? ‘itchy’
Tringgus Raya (Highland), Bukar (Eastern), Tebakang (Eastern) *māhi ‘eight’
Not all dialects exhibit the same system of full and reduced vowels in the penult. In some
groups the contrast occurs with only certain vowel qualities, and in one group the contrast does
not operate at all.

<table>
<thead>
<tr>
<th>Pattern A: complete set of full and reduced vowels</th>
<th>high</th>
<th>central</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>all Highland dialects</td>
<td>ī, ī</td>
<td>ā, ā</td>
<td></td>
</tr>
<tr>
<td>Tebakang (Eastern)</td>
<td>ā, ā</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern B: contrast in all but central vowel</th>
<th>high</th>
<th>central</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benuk (Central)</td>
<td>ī, ī</td>
<td></td>
<td>ā, ā</td>
</tr>
<tr>
<td></td>
<td>ā, ā</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern C: contrast in only the low vowel</th>
<th>high</th>
<th>central</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biatah (Central)</td>
<td>ī</td>
<td></td>
<td>ā, ā</td>
</tr>
<tr>
<td>some Penrissen (Central)</td>
<td>ā</td>
<td></td>
<td></td>
</tr>
<tr>
<td>most Eastern dialects</td>
<td>ā</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern D: no contrast</th>
<th>high</th>
<th>central</th>
<th>low</th>
</tr>
</thead>
<tbody>
<tr>
<td>all Western dialects</td>
<td>ī</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Padawan (Central)</td>
<td>ā</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bunan (Eastern)</td>
<td></td>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>

3. Sources of Bidayuh rhythmic differences
One may wonder how these rhythmic differences in the Bidayuh ultima and penult have
developed. Apparently the differences in the ultima and the penult have different sources.

3.1 Sources of lengthened vowels in the ultima
The lengthened vowels in the ultima seem to have had at least two sources:

3.1.1 Loss of Proto Bidayuh medial *h
Some lengthened vowels in Central Bidayuh and the rearticulated vowels in Western
Bidayuh, which are not lengthened vowels, have developed where a medial *h of Proto Bidayuh
has dropped out.

Proto Bidayuh *tāhas > Bukar (Eastern) tāhas, Tringgus Raya (Highland) tāhas, Biatah
(Central) tās, Serambu (Western) taas ‘ironwood’
Proto Bidayuh *muhun > Bukar (Eastern) muhun, Sembaan (Highland) muhun, Biatah
(Central) muhun, Serambu (Western) muun ‘descend’
Proto Bidayuh *tihi? > Bukar (Eastern) tihi?, Tringgus Raya (Highland) tihi?, Biatah ti?:,
Serambu (Western) tiı? ‘itchy’
Proto Bidayuh *bəhə(h) > Sangking (Eastern) bəhə, Tringgus Raya (Highland) bəhə, Biatah (Central) əbə, Serambu (Western) bəəh ‘charcoal’

3.1.2 Loss of Austronesian medial laryngeal
Nearly all non-Western dialects have lengthened vowels that have developed from Proto Bidayuh lengthened vowels, which in turn have developed where an Austronesian (or PMP) medial laryngeal has dropped out.

PAN *buSec > Proto Bidayuh *(V)bock > Sembaan (Highland) bock, Biatah (Central) uboɔk, [Serambu (Western) bok] ‘hair (of the head)’

PMP *bə[n/tiʔis > Proto Bidayuh *bɨteːs > Tebakang (Eastern) bɨteːs, Anah Rais (Highland) bɨteːs, Bistaang (Central) bãte(:)s, [Serambu (Western) bites] ‘calf (of leg)’

Another Proto Bidayuh form with a lengthened vowel may reflect an earlier form with a medial laryngeal: Proto Bidayuh *man, *maʔan > Sembaan (Highland) man, Biatah main, [Singai man]; Bukar (Eastern) maʔan ‘eat’. The consonant m of the Proto Hesperonesian reconstruction *amaq fits well with these forms, but the Proto Austronesian reconstruction *kaʔon, also glossed ‘eat’, with a medial laryngeal may offer a source for the reconstructed long vowel of Proto Bidayuh. (Note the long vowel in the Maloh form in the following section.)

The proposal that the lengthened vowels of Proto Bidayuh developed where an Austronesian medial laryngeal dropped out is supported by evidence from some other language groupings in Borneo.

Note, for example, the following examples from Maloh/Embaloh (Tamanic) in which long vowels have developed through the loss of a medial *h, *q or *y:

PAN *buSec > Maloh buck ‘hair (of the head)’

PMP *daqan > Maloh dan ‘branch’

PMP *taqu > Maloh kato: ‘right (hand)’

PMP *kaʔen > Maloh anŋkaan ‘eat’

PHN *sayap > Maloh sap ‘wing’ (Adelaar 1994)

In Salako a medial *l is often lost, e.g., PMP *bulan > Salako buatn ‘moon’, PMP *kulit > Salako kuit ‘skin’. When the same vowel occurs before and after the liquid, a rearticulated vowel results, which is similar to those of Western Bidayuh and in some contexts is pronounced as a long vowel.

PAN *Zalan > Salako bajaatn ‘walk’

PMP *lalaj > Salako aat ‘(house)fly’

PAN *tələn > Salako taatn ‘swallow’

PAN dom > Salako maam, cf. Malay malam ‘night’

3.2 Source of full and reduced vowels in the penult
Some scholars, e.g., Zorc (1978, 1983) and Ross (1994:62), suggest that PAN had differences in placement of the accent. The contrast between full and reduced vowels in the Bidayuh penult seems to be related to differences in accentual pattern in some other Austronesian (especially Philippine) languages and apparently has developed from accentual differences in Proto Austronesian.
Specifically, a Bidayuh form with a full vowel has developed from an earlier form with final stress while a Bidayuh form with a reduced vowel has developed from an earlier form with penultimate stress.

Note the following examples of Bidayuh full and reduced vowels that have developed from earlier forms with final and pre-final stress patterns, respectively.

3.2.1 PAN final stress:
- PAN *batū > Proto Bidayuh *bātuh ‘stone’
- PMP *manúk > Proto Bidayuh *mānuk ‘bird’
- PAN *limáH > Proto Bidayuh *rīmāh ‘five’
- PAN *bi+biR > Proto Bidayuh *bībih ‘lip’
- PMP *luZāq > Proto Bidayuh *ŋ-ir-ūja? ‘spit’
- PHN *bukāʔ ‘open’ > Proto Bidayuh *būkaʔ ‘wide’
- PAN *telūR > Proto Bidayuh *tūloh ‘egg’
- PAN *belī > Proto Bidayuh *mīrih, *bīrih, ‘buy’

3.2.2 PAN penultimate stress:
- PAN *kāyuH > Proto Bidayuh *kāyu ‘tree, wood’
- PAN *lāṉit > Proto Bidayuh *rāŋit ‘sky’
- PAN *d₂áya ‘inland’ > PLD *dǎyɔh ‘(up)land’
- PAN *būlan > Proto Bidayuh *būran ‘moon’
- PAN *būluq > Proto Bidayuh *būruʔ ‘bamboo’
- PMP *hūtek, *qūtek > PBB *šntok ‘brain’
- PMP *ɨpén > Proto Bidayuh *jīpōn ‘teeth’
- PAN *sí+kuH > Proto Bidayuh *sīkuh, etc. ‘elbow’

4. Conclusion
Most varieties of Bidayuh exhibit rhythmic features not shared by many of their Austronesian neighbors. In the ultima there are lengthened vowels that contrast with the considerably more common normal-length vowels. In the penult the full and reduced vowels are distinguished from each other not only through differences in sustainability but through tense vs. lax articulation and even the potential for complete deletion.

These differences in phonetic realization of the two types of contrast are paralleled by differences in historic sources of the contrasts. The lengthened vowels in the ultima derive primarily from lost medial consonants whereas the full-reduced vowel contrast in the penult relates to accentual differences of an earlier period.
References


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