Lexical tone in Ambel

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P-workshop
The University of Edinburgh

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Lexical tone in Ambel

1. Introduction

2. The phonetics of tone in Ambel
   Monosyllabic words
   L% boundary tone and the tone-bearing unit
   Polysyllabic words

3. The phonology of tone in Ambel
   Domain of specification
   Underlying specification

4. Discussion: Ambel tone in a typological context

5. Conclusion
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Ambel: Language background
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See Kamholz (2014) for subgrouping of SHWNG languages
Ambel: Typological background

- SVO constituent order
- Largely analytic
- Head marking: subject agreement on verb, possessive morphology
- Clause-final negation and aspect markers
Ambel: Segmental phonology

- **Consonants**

<table>
<thead>
<tr>
<th></th>
<th>bilabial</th>
<th>alveolar</th>
<th>velar</th>
</tr>
</thead>
<tbody>
<tr>
<td>stops</td>
<td>p</td>
<td>t</td>
<td>k</td>
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<td></td>
<td>b</td>
<td>d</td>
<td>g</td>
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<td>fricatives</td>
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<td>liquids</td>
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<td>r</td>
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<tr>
<td>semivowels</td>
<td>y</td>
<td>w</td>
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</tr>
</tbody>
</table>

- **Vowels**

- **Diphthongs analysed as vowel + semivowel sequences:**
  /iy, ey, ay, oy, uy/; /iw, ew, aw, ow, uw/
Ambel: Phonotactics

- **Syllable structure:**
  - Most frequent: CV(C)
  - Other permitted structures: V, VC, C(y)V(y)C

- **Possible codas:**
  - voiceless stops, nasals, liquids, semivowels
The project

- Very little previous work:
  - Word list and sketch in Remijsen (2001)
  - Word lists in Smits and Voorhoeve (1992) and Hartzler (1978)

- **Aim:** To document and describe the Ambel language
  - Corpus of recordings (c. 15 hours), transcribed and translated
  - Descriptive grammar of Ambel
  - Lexicon of c. 2000 items
The data for the project come from two sources:
- Controlled elicitation with native speakers
- Naturalistic texts, transcribed and translated with the help of native speakers

Most of the data discussed in this presentation come from controlled elicitation sessions:
- 5 native speakers of Ambel: 3 male, 2 female, aged 22-30
- Recorded 56 words in four contexts (isolation, utterance-finally, utterance-medially, negative)
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Monosyllables: Isolation tones

- Four tones manifest on monosyllabic words in isolation:

(1) High flat [H]  
láp 'fire'  
súp '1SG.bathe'

(2) High to low falling [HL]  
gâm 'night'  
y-ôl '1SG-stand'

(3) Low to high rising [LH]  
wě 'water'  
súp '1SG.add'

(4) Low-high-low rise fall [LHL]  
tũn 'thorn'  
y-ûl '1SG-beat'
Monosyllables: Minimal pairs

- Minimal pairs demonstrate an underlying contrast between:
  - $[H] \sim [LH]$
    
    e.g. $[\text{súp}]$ ‘bathe.1SG’ $[\text{sǔp}]$ ‘add.1SG’
  
  - $[HL] \sim [LHL]$
    
    e.g. $[\text{tûn}]$ ‘moon’ $[\text{tǔn}]$ ‘thorn’
    
    $[\text{y-ûl}]$ ‘1SG-call’ $[\text{y-ûl}]$ ‘1SG-beat’
Monosyllables: In context

- [LH] and [LHL] pattern together utterance-medially → [L]:

  (1) [LH] in isolation → [L] utterance-medially

     产地 'I say “I add” to Laura.'

  (2) [LHL] in isolation → [L] utterance-medially

     产地 ‘tõn ‘thorn’ 'I say “thorn” to Laura.’
Monosyllables: In context

- [H] and [HL] pattern together utterance-medially → [H]:

(3) [H] in isolation → [H] utterance-medially

súp  ìné jìnè súp bé Láurā
‘bathe.1SG’  ‘I say “I bathe” to Laura.’

(4) [HL] in isolation → [H] utterance-medially

tún  ìné jìnè tún bé Láurā
‘moon’  ‘I say “moon” to Laura.’
Monosyllables: Tone sandhi

- [LH] and [LHL] pattern together:

(5) [LH] in isolation: negative marker *pǒ* realised as [LH]

```
sǔp          Ŭně jînè sǔp *pǒ*
‘add.1SG’    ‘I don’t say “I add”.’
```

(6) [LHL] in isolation: negative marker *pǒ* realised as [LH]

```
tũn          Ŭně jînè tũn *pǒ*
‘thorn’      ‘I don’t say “thorn”.’
```
Monosyllables: Tone sandhi

- [H] and [HL] pattern together:

(7) [H] in isolation: negative marker pō realised as [M]

\begin{align*}
\text{súp} & \quad \text{ìné jìné súp pō} \\
\text{‘bathe.1SG'} & \quad \text{‘I don’t say “I bathe”.’}
\end{align*}

(8) [HL] in isolation: negative marker pō realised as [M]

\begin{align*}
\text{tùn} & \quad \text{ìné jìné tùn pō} \\
\text{‘moon'} & \quad \text{‘I don’t say “moon”.’}
\end{align*}
Monosyllables: Summary

- Four tones realised on monosyllabic words in isolation:
  \([H], [HL], [LH], [LHL]\)

- Evidence that this reflects an underlying two-way contrast:
  - Distribution of minimal pairs
    - yes: \([H] \text{ vs. } [LH], [HL] \text{ vs. } [LHL]\)
    - no: \([H] \text{ vs. } [HL], [H] \text{ vs. } [LHL]; [LH] \text{ vs. } [HL], [LH] \text{ vs. } [LHL]\)
  - Utterance-medially:
    - \([H] \text{ and } [HL] \text{ pattern together } \rightarrow [H]\)
    - \([LH] \text{ and } [LHL] \text{ pattern together } \rightarrow [L]\)
  - Tone sandhi:
    - \([H] \text{ and } [HL] \text{ pattern together: negative marker } p̄ō \rightarrow [M]\)
    - \([LH] \text{ and } [LHL] \text{ pattern together: negative marker } p̄ō \rightarrow [LH]\)
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5. Conclusion
[L] final target of [HL] and [LHL]

- We can make two observations about [L] final target of [HL] and [LHL] isolation monosyllables:

```
<table>
<thead>
<tr>
<th>[H]</th>
<th>[LH]</th>
<th>[HL]</th>
<th>[LHL]</th>
</tr>
</thead>
<tbody>
<tr>
<td>yé</td>
<td>wě</td>
<td>tûn</td>
<td>tûn</td>
</tr>
<tr>
<td>‘island’</td>
<td>‘water’</td>
<td>‘moon’</td>
<td>‘thorn’</td>
</tr>
<tr>
<td>lâp</td>
<td>gõp</td>
<td>dôw</td>
<td>nõw</td>
</tr>
<tr>
<td>‘fire’</td>
<td>‘jambu’</td>
<td>‘rattan’</td>
<td>‘house’</td>
</tr>
<tr>
<td>kút</td>
<td>ǔt</td>
<td>mîy</td>
<td>bęb</td>
</tr>
<tr>
<td>‘coconut’</td>
<td>‘louse’</td>
<td>‘rain’</td>
<td>‘sago’</td>
</tr>
</tbody>
</table>
```

1. [L] final target only occurs on syllables which have in the coda a sequence of vowel plus sonorant consonant.

2. [L] final target occurs utterance-finally in declarative utterances.
1. Syllable weight

- [L] final target only occurs on syllables which have in the coda a sequence of vowel plus sonorant consonant.
  \[ \rightarrow \text{[L] final target only occurs on heavy syllables.} \]

- Weight of a syllable is determined by the number of morae found in the coda.
  - Segments contributing to moraic weight:
    - Vowels /i, e, a, o, u/
    - Semi-vowels /w, y/
    - Liquids /l, r/
    - Nasals /m, n/
  - Segments permitted to occur in the coda which do not contribute to moraic weight:
    - Voiceless stops /p, t, k/
2. L% boundary tone

- [L] final target only occurs utterance-finally
  This is reasonable grounds to posit an utterance-final L% boundary tone for declarative statements
- This boundary tone only docks on the second mora of a syllable i.e. L% only manifests on bimoraic syllables
The interaction between syllable weight and L%:

» The interaction between H syllables and L%:

**Monomoraic:**

\[
\sigma \\
\mu \\
\text{H} \quad \text{L%} \quad \rightarrow \quad [H]
\]

**Bimoraic:**

\[
\sigma \\
\mu \\
\mu \\
\text{H} \quad \text{L%} \quad \rightarrow \quad [HL]
\]
The interaction between syllable weight and L%:

- The interaction between LH syllables and L%:

  **Monomoraic:**
  \[
  \sigma \quad \mu \quad L^\% \rightarrow [LH]
  \]

  **Bimoraic:**
  \[
  \sigma \quad \mu \quad \mu \quad \mu \quad \mu \quad L^\% \rightarrow [LHL]
  \]
The tone bearing unit in Ambel

- The interaction between syllable weight and L% boundary tone allows us to identify the TBU in Ambel:
  - L% will only dock on the second mora of a syllable.
  - The underlying tonal specification manifests on the first mora of the syllable.
  - **The TBU in Ambel is the first mora of the syllable.**
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Disyllables: Minimal pairs

- Two tonal patterns on native Ambel disyllabic words:

  - [H.M]
    - kámūk
    - ‘reciprocal namesake’
    - kábôm
    - ‘widow’

  - [L.H]
    - kàmúk
    - ‘in-law’
    - kàbôm
    - ‘bone’
Disyllables: Tone sandhi

(9) Preposition *be*:

a. [H.M] in isolation: Preposition *be* realised as [L]

[kámũk]  [ître  jëvé kámũk bè Láurã]  
‘namesake’  ‘I say “namesake” to Laura.’

b. [L.H] in isolation: Preposition *be* realised as [H]

[kàmũk]  [ître  jëvé kàmûk bé Láurã]  
‘in-law’  ‘I say “in-law” to Laura.’
(10) Negative marker pǒ:

a. [H.M] in isolation: Negative marker pǒ realised as [LH]

[kámūk] [íné jìnê kámūk pǒ] 🎧 ‘namesake’ ‘I don’t say “namesake”.’

b. [L.H] in isolation: Negative marker pǒ realised as [M]:

[kàmúk] [íné jìnê kàmúk pō] 🎧 ‘in-law’ ‘I don’t say “in-law”.’
Trisyllables: Contrasts

- Three tonal patterns on native Ambel trisyllabic words:

\[
[H.M.LH] \quad [L.H.M] \quad [L.L.H]
\]

kàbábât \quad ‘butterfly’ \quad kàlàbét \quad ‘goanna’

yàgàlî \quad ‘help.1SG’ \quad yàgàlî \quad ‘dive.1SG’
Trisyllables: Tone sandhi

(11) \([H.M.LH]\) in isolation:

\[\text{yágālī} \quad \text{‘help.1sg’}\]

Preposition \(\text{be}\) realised as \([L]\):

\[\text{[íné jìné yágālī bè Láurā]}\]

\‘I say “I help” to Laura.’

Negative marker \(pō\) realised as \([LH]\):

\[\text{[íné jìné yágālī pō]}\]

\‘I don’t say “I help”.’
Trisyllables: Tone sandhi

(12) [L.H.M] in isolation:

\[ yàgálī \]

‘dive.1sg’ Preposition *be* realised as \([L]\):

[\[ìné jìné \ yàgálī be Láurā\] ☢

‘I say “I dive” to Laura.’

Negative marker \(pŏ\) realised as \([LH]\):

[\[ìné jìné \ yàgálī pŏ\] ☢

‘I don’t say “I dive”.’

- No data at this stage for \([L.L.H]\) trisyllables.
Phonetics of tone in Ambel: Summary

- Four tones realised on monosyllabic words in isolation:
  \([H], [HL], [LH], [LHL]\)

  - The utterance-final [L] of [HL] and [LHL] monosyllables is predictable based on an interaction between syllable weight and a postlexical L% boundary tone.
  - Evidence from minimal pairs, tonal realisation in context, and tone sandhi supports an analysis in which there is a two-way underlying contrast.
Phonetics of tone in Ambel: Summary

- Two patterns realised on native disyllabic words in isolation:
  \[ \text{[H.M]}, \text{[L.H]} \]
  - Tone sandhi:
    - [H.M] disyllables pattern with [LH] monosyllables
    - [L.H] disyllables pattern with [H] monosyllables

- Three patterns realised on native trisyllabic words in isolation:
  \[ \text{[H.M.LH]}, \text{[L.H.M]}, \text{[L.L.H]} \]
  - Tone sandhi:
    - [H.M.LH] and [L.H.M] pattern with [LH] monosyllables
    - No data so far showing the tone sandhi of [L.L.H] trisyllables
Polysyllables: A marginal group

- There is an additional tonal pattern for both disyllables and trisyllables in Ambel:
  
  \[\text{[L.LH]} \quad \text{[L.L.LH]}\]

- These patterns are very marginal:
  - Very few words in the corpus so far have these patterns
  - All the words that have these patterns are loan words:

  e.g. \([\text{käṭjàŋ}] \quad \text{‘bean’} \quad \text{PM kacang} \quad \text{‘papaya’} \quad \text{PM papaya}\)

- These patterns are relevant to the following section, in which the underlying system is discussed.
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Syllable vs word-level systems

- Donohue (1997) distinguishes:
  - Syllable-level systems: Tone is specified on the syllable
  - Word-level systems: Tone is specified across the whole root

- Is the domain of tonal specification in Ambel syllable-level or word-level?
Word-level specification

- Underlying /LH/ specification on root:

  **Monosyllabic:**

  \[
  \begin{array}{c}
  [LH] \\
  \sigma \\
  /LH/ \\
  \end{array}
  \]

  **Disyllabic:**

  \[
  \begin{array}{c}
  [L] \\
  \sigma \\
  [H] \\
  \sigma \\
  /LH/ \\
  \end{array}
  \]
Word-level specification

- Underlying /H/ specification on root:

  **Monosyllabic:**
  
  ![Diagram for Monosyllabic]

  **Disyllabic:**
  
  ![Diagram for Disyllabic]
Arguments against root-level tonal specification in Ambel:

1. Two underlying specifications on the root, /H/ and /LH/, but three tonal patterns found on trisyllabic words.

2. If [H] and [H.M] are both from /H/, we would expect tone sandhi phenomena to be the same. In fact, we find the opposite:
   - [H.M] disyllables pattern with [LH] monosyllables
   - [L.H] disyllables pattern with [H] monosyllables

Conclusion: Tone in Ambel is specified on the syllable, not on the whole root.
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[LH] and [L]

- Whether a syllable is realised as [L] or [LH] is predictable from utterance context:

(13) [LH] utterance-finally:

\[ \text{sǔp} \quad \text{ìné jìnè sǔp} \]

‘add.1SG’ ‘I say “I add”.’

(14) [L] utterance-medially:

\[ \text{sǔp} \quad \text{ìné jìnè sùp bē Láurā} \]

‘add.1SG’ ‘I say “I add” to Laura.’

Hypothesis: [LH] and [L] are realisations of the same underlying specification.
Possible specifications

- Logically, there are three possible underlying specifications:
  - /H/ vs. /L(H)/
  - /H/ vs. /Ø/
  - /L(H)/ vs. /Ø/
Argument for an underlying specification of /H/:

1. Evidence from tone sandhi suggests a rightwards H-spreading rule:

\[
\text{L}(H) \rightarrow [M] / H \quad \rightarrow [\text{L}(H)] \quad \text{elsewhere}
\]

- e.g. súp 'bathe.1SG'
- ñé jíné súp pō ‘I don’t say “I bathe”.’
- tûn 'moon'
- ñé jíné tún pō ‘I don’t say “moon”.’
Two arguments for an underlying specification of /H/: 

2. Distribution of [H] suggests only one [H] is permitted per word:

**Monosyllables**  
[H]  
[LH]  

**Disyllables**  
[H.M]  
[L.H]  

**Trisyllables**  
[H.M.LH]  
[L.H.M]  
[L.L.H]
Argument for an underlying specification of /H/:

- Two arguments for an underlying specification of /H/:
  - As both these rules make reference to H, this suggests that there is an underlying /H/ specification.
Possible specifications

- Logically, there are three possible underlying specifications:
  - /H/ vs. /L(H)/
  - /H/ vs. /Ø/
  - /L(H)/ vs. /Ø/
Argument for /H/ vs. /LH/

- Realisation of [LH] utterance-finally suggests that the [H] target is underlying.
- An analysis of /H/ vs. /L/ or /H/ vs. /Ø/ would have to account for the [H] target on these syllables.
An equipollent analysis

- Summary of underlying specifications of native Ambel words following an equipollent analysis:

<table>
<thead>
<tr>
<th>Isolation</th>
<th>Underlying specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Monosyllables</strong></td>
<td></td>
</tr>
<tr>
<td>[H]</td>
<td>/H/</td>
</tr>
<tr>
<td>[LH]</td>
<td>/LH/</td>
</tr>
<tr>
<td><strong>Disyllables</strong></td>
<td></td>
</tr>
<tr>
<td>[H.M]</td>
<td>/H.LH/</td>
</tr>
<tr>
<td>[L.H]</td>
<td>/LH.H/</td>
</tr>
<tr>
<td><strong>Trisyllables</strong></td>
<td></td>
</tr>
<tr>
<td>[H.M.LH]</td>
<td>/H.LH.LH/</td>
</tr>
<tr>
<td>[L.H.M]</td>
<td>/LH.H.LH/</td>
</tr>
<tr>
<td>[L.L.H]</td>
<td>/LH.LH.H/</td>
</tr>
</tbody>
</table>
Argument for /H/ vs. /Ø/ 

- Recall the marginal patterns [L.LH] and [L.L.LH]: 
  - Why do these pattern only turn up on loanwords?

- **Hypothesis:**
  - [L(H)] syllables are underlyingly unspecified for tone
  - Native Ambel polysyllables must have one syllable that is specified for tone
  - Loanwords are borrowed by default with no tonal specification
A privative analysis

- Summary of underlying specifications of native Ambel words following a privative analysis:

<table>
<thead>
<tr>
<th>Isolation</th>
<th>Monosyllables</th>
<th>Underlying specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>[H]</td>
<td>/H/</td>
<td></td>
</tr>
<tr>
<td>[LH]</td>
<td>/Ø/</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disyllables</th>
<th>[H.M]</th>
<th>/H.Ø/</th>
</tr>
</thead>
<tbody>
<tr>
<td>[L.H]</td>
<td>/Ø.H/</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Trisyllables</th>
<th>[H.M.LH]</th>
<th>/H.Ø.Ø/</th>
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<tbody>
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<td>[L.H.M]</td>
<td>/Ø.H.Ø/</td>
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Hyman (2006)’s word-prosodic typology

- **Stress accent language**
  Every phonological word has ONE and ONLY ONE syllable marked as the most metrically prominent (obligatoriness, culminativity)

- **Tone language**
  Lexical realisation of pitch on at least some morphemes

<table>
<thead>
<tr>
<th>+ stress accent</th>
<th>- stress accent</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ tone</td>
<td>Ma'ya, Serbo-Croatian</td>
</tr>
<tr>
<td>- tone</td>
<td>English, Russian</td>
</tr>
</tbody>
</table>
Ambel in Hyman (2006)’s typology

- Under a privative analysis, [H] pitch in native Ambel polysyllables is both obligatory and culminative.
  - This appears to meet Hyman’s definition of a stress accent system

- However, [H] pitch is not obligatory throughout the system:
  - /Ø/ specification on native monosyllables
  - /Ø.Ø/ and /Ø.Ø.Ø/ specification on polysyllabic loans

**Conclusion:** Under a privative analysis, contrastive pitch is culminative, but not obligatory.

Therefore, following Hyman (2006)’s typology, **Ambel is a tone language.**
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Following Hyman (2006)’s typology, Ambel is a tone language

There are two contrastive, non-predictable pitch patterns in Ambel:

- This may reflect a system which is underlingly /H/ vs /LH/ or /H/ vs /Ø/

Tone is specified on the syllable

The tone-bearing unit is the first mora of the syllable
More data are needed from trisyllabic words in context, and from all words in different kinds of contexts.

If the system is underlingly /H/ vs. /Ø/, how do we account for the [H] target in utterance-final /Ø/ syllables (i.e. [LH] and [LHL])?

Can function words bear tone?

How do tone terracing phenomena operate?

How does tone interact with intonation in utterances other than declarative utterances?


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