



Lexical tone in Ambel

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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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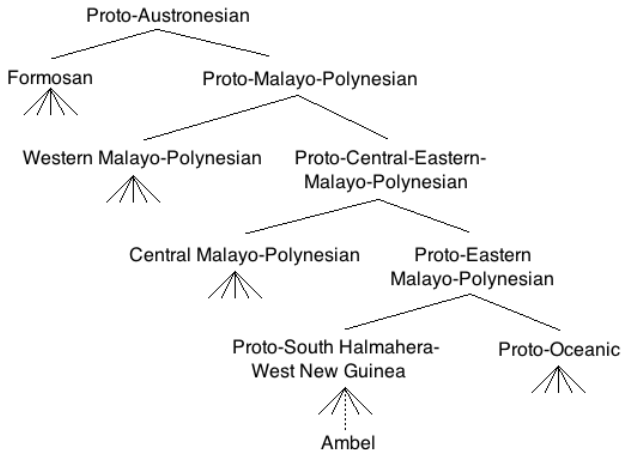
Ambel: Language background



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See Kamholz (2014) for subgrouping of SHWNG languages

Ambel: Typological background

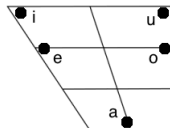
- ▶ SVO constituent order
- ▶ Largely analytic
- ▶ Head marking: subject agreement on verb, possessive morphology
- ▶ Clause-final negation and aspect markers

Ambel: Segmental phonology

► Consonants

	bilabial	alveolar	velar
stops	p b	t d	k g
fricatives	f	s	
nasals	m	n	
liquids		l r	
semivowels		y	w

► 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 project

- ▶ 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'	
		sǔp	'1SG.add'	
(4)	Low-high-low rise fall [LHL]	tũn	'thorn'	
		y-ũl	'1SG-beat'	

Monosyllables: Minimal pairs


- ▶ Minimal pairs demonstrate an underlying contrast between:


- ▶ [H] ~ [LH]


e.g. [súp] 
'bathe.1SG'


[sǔp] 
'add.1SG'

- ▶ [HL] ~ [LHL]

e.g. [tûn] 
'moon'

[tũn] 
'thorn'


[y-ûl] 
'1SG-call'

[y-ũl] 
'1SG-beat'


Monosyllables: In context

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

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

sǔp ìné jìné **sùp** bē Láurā
'add.1SG' 'I say "I add" to Laura.' 


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

tũn ìné jìné **tùn** bē Láurā
'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 jìné **súp** bé Láurā
'bathe.1SG' 'I say "I bathe" to Laura.' 


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

tûn ìné jìné **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 ìné jìné sùp **pǒ**
'add.1SG' 'I don't say "I add" .' 

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

tǔn ìné jìné tùn **pǒ**
'thorn' 'I don't say "thorn" .' 

Monosyllables: Tone sandhi

- ▶ [H] and [HL] pattern together:

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

súp ìné jìné súp **pō**
'bathe.1SG' 'I don't say "I bathe".'



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

tûn ìné jìné tún **pō**
'moon' 'I don't say "moon".'



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] vs. [LH], [HL] vs. [LHL]
no: [H] vs. [HL], [H] vs. [LHL]; [LH] vs. [HL], [LH] vs. [LHL]
 - ▶ Utterance-medially:
[H] and [HL] pattern together → [H]
[LH] and [LHL] pattern together → [L]
 - ▶ Tone sandhi:
[H] and [HL] pattern together: negative marker *pǒ* → [M]
[LH] and [LHL] pattern together: negative marker *pǒ* → [LH]

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[L] final target of [HL] and [LHL]

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

[H]		[LH]		[HL]		[LHL]	
yé	'island'	wě	'water'	tûn	'moon'	tũn	'thorn'
láp	'fire'	gǒp	'jambu'	dôw	'rattan'	nõw	'house'
kút	'coconut'	ũt	'louse'	mîy	'rain'	běy	'sago'

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.
 - [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/

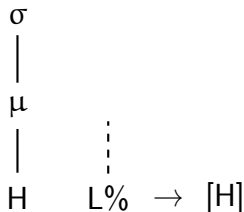
2. L% boundary tone

- ▶ [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

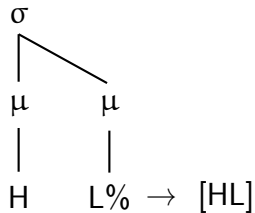
The interaction between syllable weight and L%

- ▶ The interaction between H syllables and L%:

Monomoraic:



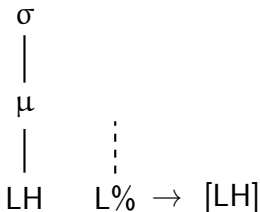
Bimoraic:



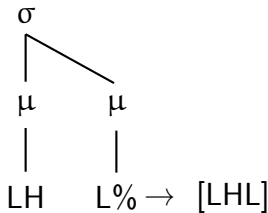
The interaction between syllable weight and L%

- The interaction between LH syllables and L%:

Monomoraic:



Bimoraic:



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'

kâbôm


'bone'




Disyllables: Tone sandhi

(9) Preposition *be*:

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

[kámūk] [iné jìné **kámūk bè** Láurā] 
'namesake' 'I say "namesake" to Laura.'


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

[kàmúk] [iné jìné **kàmúk bé** Láurā] 
'in-law' 'I say "in-law" to Laura.'


Disyllables: Tone sandhi

(10) Negative marker *pǒ*:

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

[kámūk] [ìné jìné **kámūk pǒ**] 
'namesake' 'I don't say "namesake".'

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

[kàmúk] [ìné jìné **kàmúk pō**] 
'in-law' 'I don't say "in-law".'

Trisyllables: Contrasts

- ▶ Three tonal patterns on native Ambel trisyllabic words:

[H.M.LH]

[L.H.M]

[L.L.H]

kàbábāt
'butterfly'



kàlàbét
'goanna'



yágāĩ
'help.1SG'



yàgáĩ
'dive.1SG'



Trisyllables: Tone sandhi

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

yágāĩ

'help.1sg'

Preposition *be* realised as [L]:

[ĩné jìné **yágāĩ bè** Láurā] 

'I say "I help" to Laura.'

Negative marker *pǒ* realised as [LH]:

[ĩné jìné **yágāĩ pǒ**] 

'I don't say "I help".'

Trisyllables: Tone sandhi

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

yàgáŋ

'dive.1sg'

Preposition *be* realised as [L]:

[iné jìné **yàgáŋ bè** Láurā] ◀▶

'I say "I dive" to Laura.'

Negative marker *pǒ* realised as [LH]:

[iné jìné **yàgáŋ pǒ**] ◀▶

'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:

[H.M], [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:

[H.M.LH], [L.H.M], [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:

[L.LH] [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. [kàtʃãŋ]  [kàpàyă] 
 'bean' < PM *kacang* 'papaya' < 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

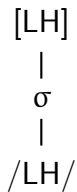
- ▶ Donohue (1997) distinguishes:
 - ▶ Syllable-level systems: Tone is specified on the syllable
 - ▶ Word-level systems: Tone is specified across the whole root

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

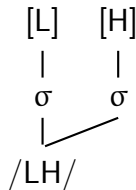
Word-level specification

- Underlying /LH/ specification on root:

Monosyllabic:



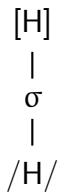
Disyllabic:



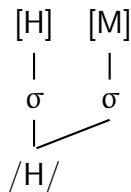
Word-level specification

- Underlying /H/ specification on root:

Monosyllabic:



Disyllabic:



Word-level specification

- ▶ 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:

sǔp ìné jìné **sǔp** 
'add.1SG' 'I say "I add".'

(14) [L] utterance-medially:

sǔp ìné jìné **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. /∅/
 - ▶ /L(H)/ vs. /∅/

Argument for an underlying specification of /H/

- ▶ Two arguments for an underlying specification of /H/:
 1. Evidence from tone sandhi suggests a rightwards H-spreading rule:

L(H) → [M] / H _____

→ [L(H)] elsewhere

e.g. súp ìné jìné súp **pō**
 'bathe.1SG' 'I don't say "I bathe".'

tûn ìné jìné tûn **pō**

Argument for an underlying specification of /H/

- ▶ Two arguments for an underlying specification of /H/:
 2. Distribution of [H] suggests only one [H] is permitted per word:

<i>Monosyllables</i>	[H] [LH]
<i>Disyllables</i>	[H.M] [L.H]
<i>Trisyllables</i>	[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. /∅/
 - ▶ ~~/L(H)/ vs. /∅/~~

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. /∅/ 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:

	Isolation	Underlying specification
<i>Monosyllables</i>	[H]	/H/
	[LH]	/LH/
<i>Disyllables</i>	[H.M]	/H.LH/
	[L.H]	/LH.H/
<i>Trisyllables</i>	[H.M.LH]	/H.LH.LH/
	[L.H.M]	/LH.H.LH/
	[L.L.H]	/LH.LH.H/

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:

	Isolation	Underlying specification
<i>Monosyllables</i>	[H]	/H/
	[LH]	/Ø/
<i>Disyllables</i>	[H.M]	/H.Ø/
	[L.H]	/Ø.H/
<i>Trisyllables</i>	[H.M.LH]	/H.Ø.Ø/
	[L.H.M]	/Ø.H.Ø/
	[L.L.H]	/Ø.Ø.H/

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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

	+ stress accent	- stress accent
+ tone	Ma'ya, Serbo-Croatian	Yoruba, Igbo
- tone	English, Russian	French, Bella Coola

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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Conclusion

- ▶ 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 underlyingly /H/ vs /LH/ or /H/ vs /Ø/
- ▶ Tone is specified on the syllable
- ▶ The tone-bearing unit is the first mora of the syllable

Remaining questions

- ▶ More data are needed from trisyllabic words in context, and from all words in different kinds of contexts.
- ▶ If the system is underlyingly /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?

References

- DONOHUE, MARK, 1997. Tone systems in New Guinea. *Linguistic Typology* 1(3):347–386.
- HARTZLER, DWIGHT, 1978. *Waigeo Survey Report*. Jayapura: Summer Institute of Linguistics and Universitas Cendrawasih. [Unpublished typewritten report].
- HYMAN, LARRY M., 2006. Word-prosodic typology. *Phonology* 23(2):225–257.
- KAMHOLZ, DAVID, 2014. *Austronesians in Papua: Diversification and change in South Halmahera–West New Guinea*. Ph.D. thesis, University of California, Berkeley.
- REMIJSEN, BERT, 2001. *Word-prosodic systems of Raja Ampat languages*. Utrecht: LOT.
- SMITS, LEO AND C. L. VOORHOEVE, 1992. *The J. C. Anceaux collection of wordlists of Irian Jaya languages A: Austronesian languages (Part I)*. Irian Jaya Source Material No. 4 Series B. 1

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