Syntagmatic Markedness in Tonga Tone

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Markedness: Perspectives in Morphology and Phonology
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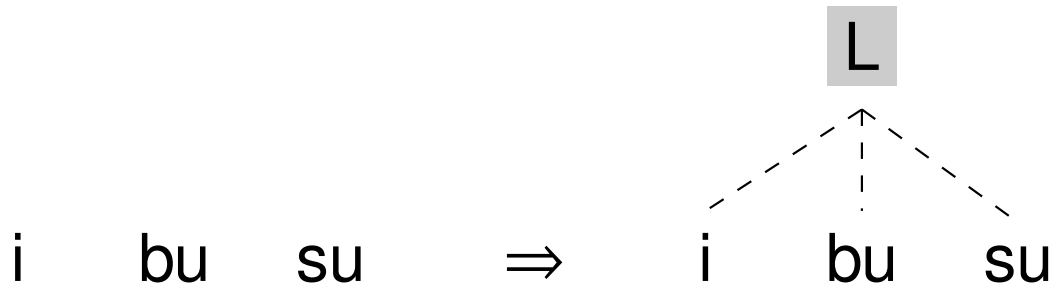
Unaccented vs. Accented Nouns (Pulleyblank 1986:165)

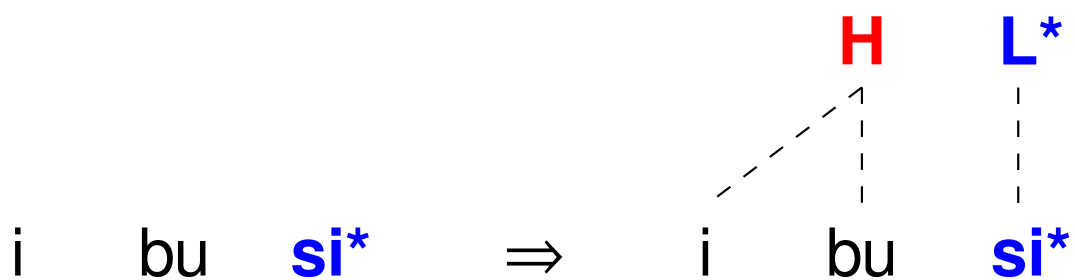
Unaccented:	**ì**	**bù**	**sù**	‘flour’
	CL	CL	N	
Accented:	**í**	**bú**	**sì**	‘smoke’
	CL	CL	N	

Unaccented vs. Accented Nouns (Pulleyblank 1986:165)

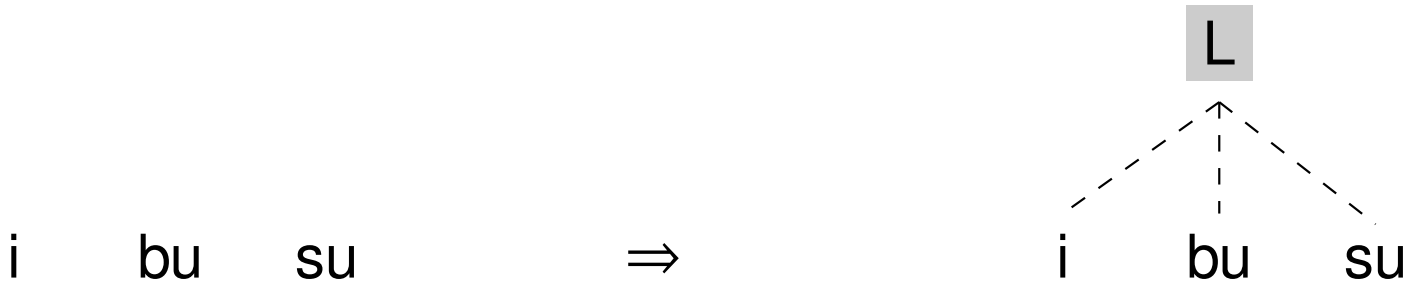
Unaccented		Accented	
ì bù sù	‘flour’	**í bú sì**	‘smoke’
ì mù ntù	‘person’	**í cí tòn**gà	‘Tonga language’
ì dà	‘stomach’	**í mú súnè**	‘ox’
ì bà sàkwà	‘boys, men’	**í mú lá là**	‘mamba’

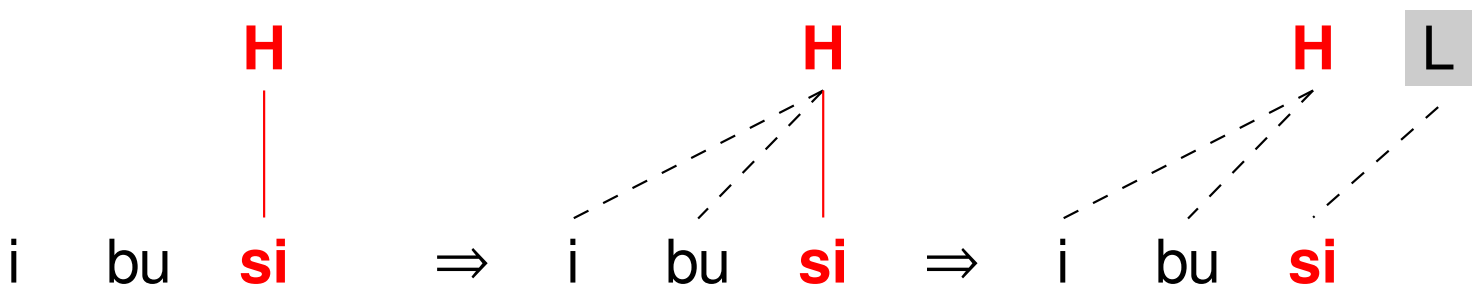
Goldsmith's Analysis (Goldsmith 1984:20-24)



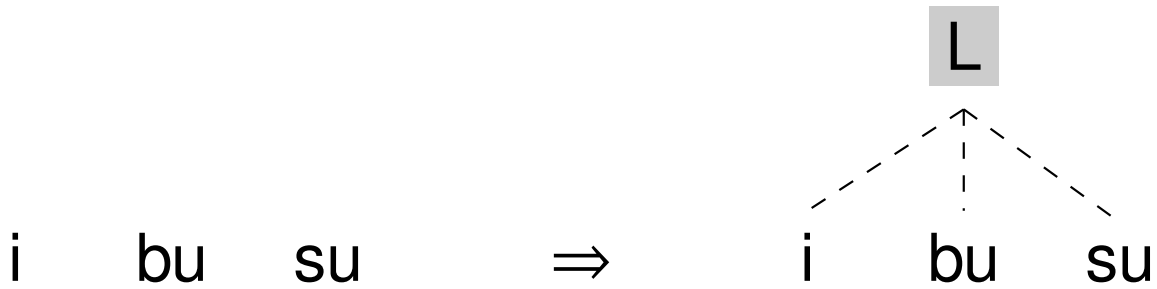


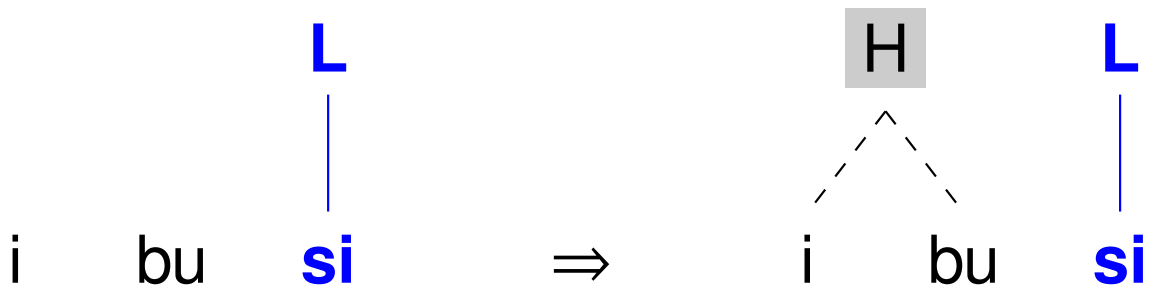
Pulleyblank's Analysis (Pulleyblank 1986:165)





Reanalysis in this Talk





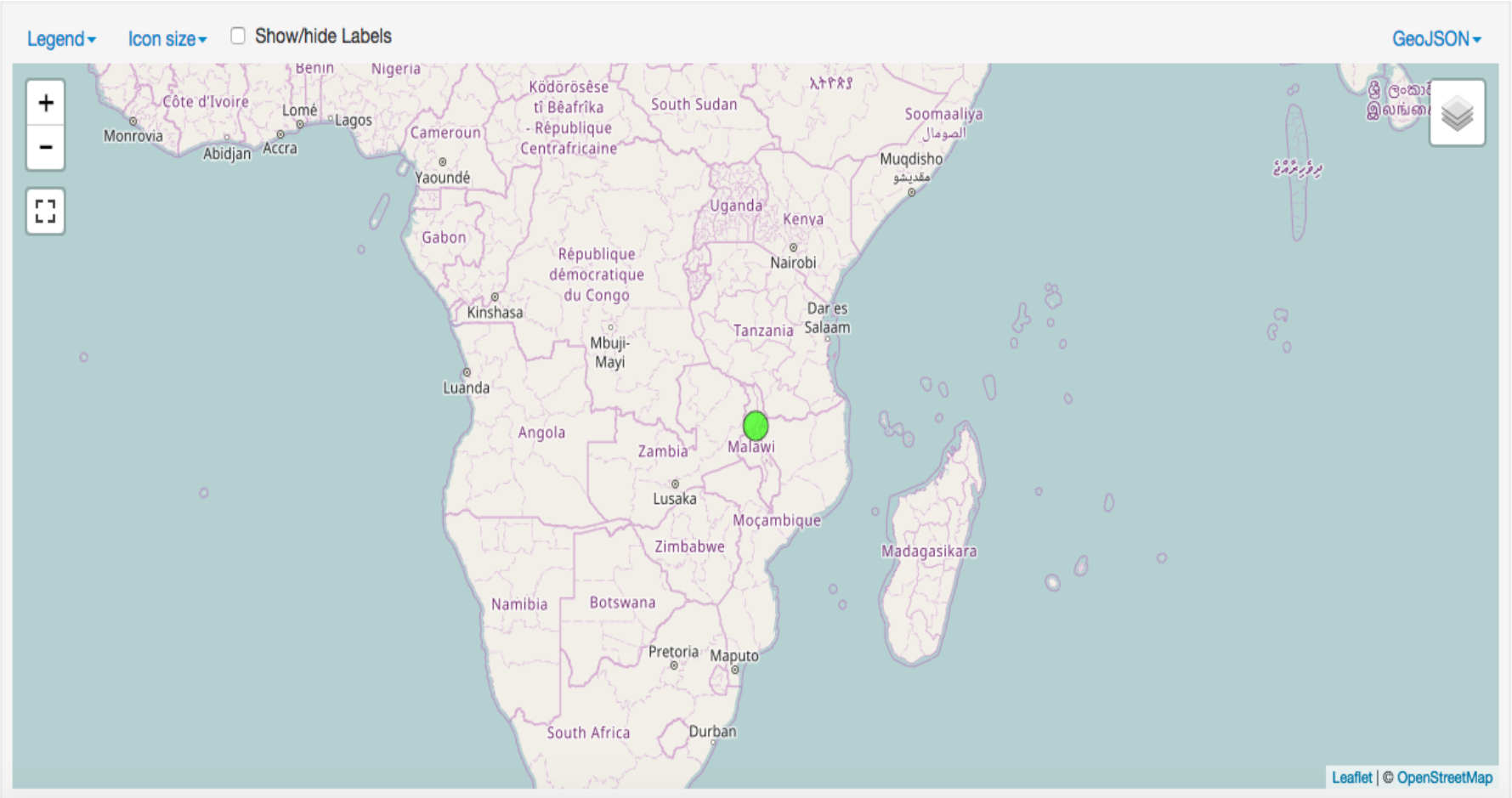
Claims of this Talk

- One more language with **privative** marked (underlyingly specified) **Low tone**
- Unmarked default tone depends on **context** – no unitary default tone
- Markedness **reversal** in morphological tone

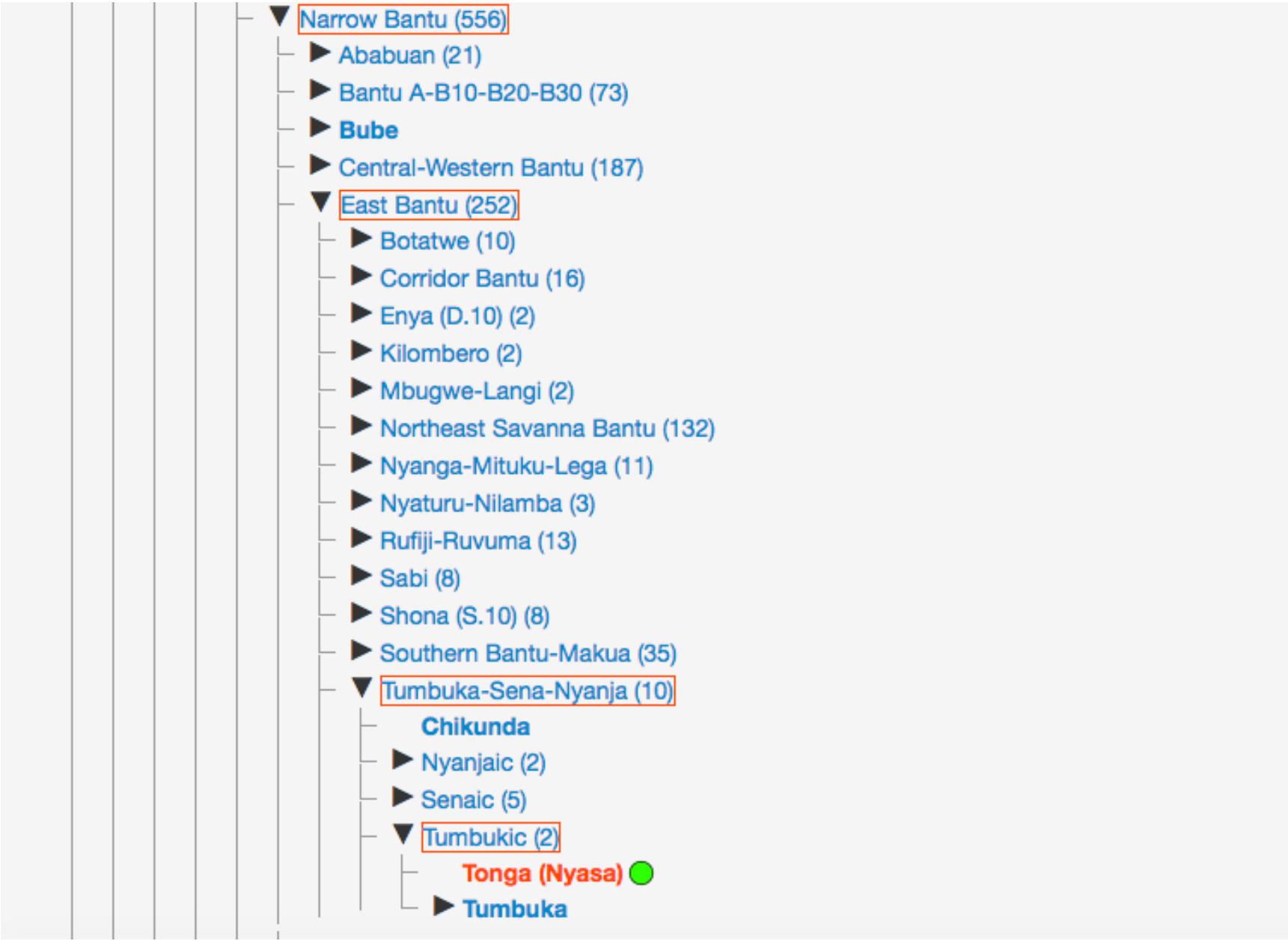
Tonga

- Bantu language spoken by $\approx$ 170,000 in Malawi at Lake Malawi
- also ‘Nyasa’, ‘Chitonga’ (ISO 639-2)
- Classical tonal ‘pitch accent’ language
- Previous analyses by Goldsmith (1976, 1984), Pulleyblank (1986)

Tonga


Legend
Icon size
Show/hide Labels
GeoJSON
Benin
Nigeria
Côte d'Ivoire
Lomé
Lagos
Monrovia
Abidjan
Accra
Cameroun
Yaoundé
Ködörösêse tî Bêafrîka - République Centrafricaine
South Sudan
Soomaaliya
الصومال
Muqdisho
مقديشو
Uganda
Kenya
Nairobi
Gabon
République démocratique du Congo
Kinshasa
Mbuji-Mayi
Luanda
Tanzania
Dar es Salaam
Angola
Zambia
Malawi
Lusaka
Moçambique
Zimbabwe
Madagasikara
Namibia
Botswana
Pretoria
Maputo
South Africa
Durban
Leaflet | © OpenStreetMap

Tonga


Narrow Bantu (556)
Ababuan (21)
Bantu A-B10-B20-B30 (73)
Bube
Central-Western Bantu (187)
East Bantu (252)
Botatwe (10)
Corridor Bantu (16)
Enya (D.10) (2)
Kilombero (2)
Mbugwe-Langi (2)
Northeast Savanna Bantu (132)
Nyanga-Mituku-Lega (11)
Nyaturu-Nilamba (3)
Rufiji-Ruvuma (13)
Sabi (8)
Shona (S.10) (8)
Southern Bantu-Makua (35)
Tumbuka-Sena-Nyanja (10)
Chikunda
Nyanjaic (2)
Senaic (5)
Tumbukic (2)
Tonga (Nyasa)
Tumbuka

Theoretical Assumptions

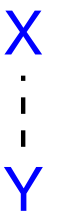
Theoretical Assumptions

- **Autosegmental Containment:** (extending Prince & Smolensky 1993)
  Underlying material
  is never literally deleted, but retained in the output,
  (but may be marked as phonetically invisible).

- **Constraint Cloning:** (cf. Cloning in Correspondence Theory, McCarthy & Prince 1995)
  All markedness constraints are assumed to exist in two versions,
  one referring only to phonetically visible material,
  and one to all material in a given structure.

- **The Lateral Theory of Coalescence** (Trommer 2016)
  Coalescence is lateral association of type-identical nodes
  on the same tier

Representation of Association Lines (Zimmermann & Trommer 2011)

Morphological association lines		Epenthetic association lines
phonetically visible:	phonetically invisible:	phonetically visible:
		

Axiom of Phonetic Visibility (Zimmermann & Trommer 2014)

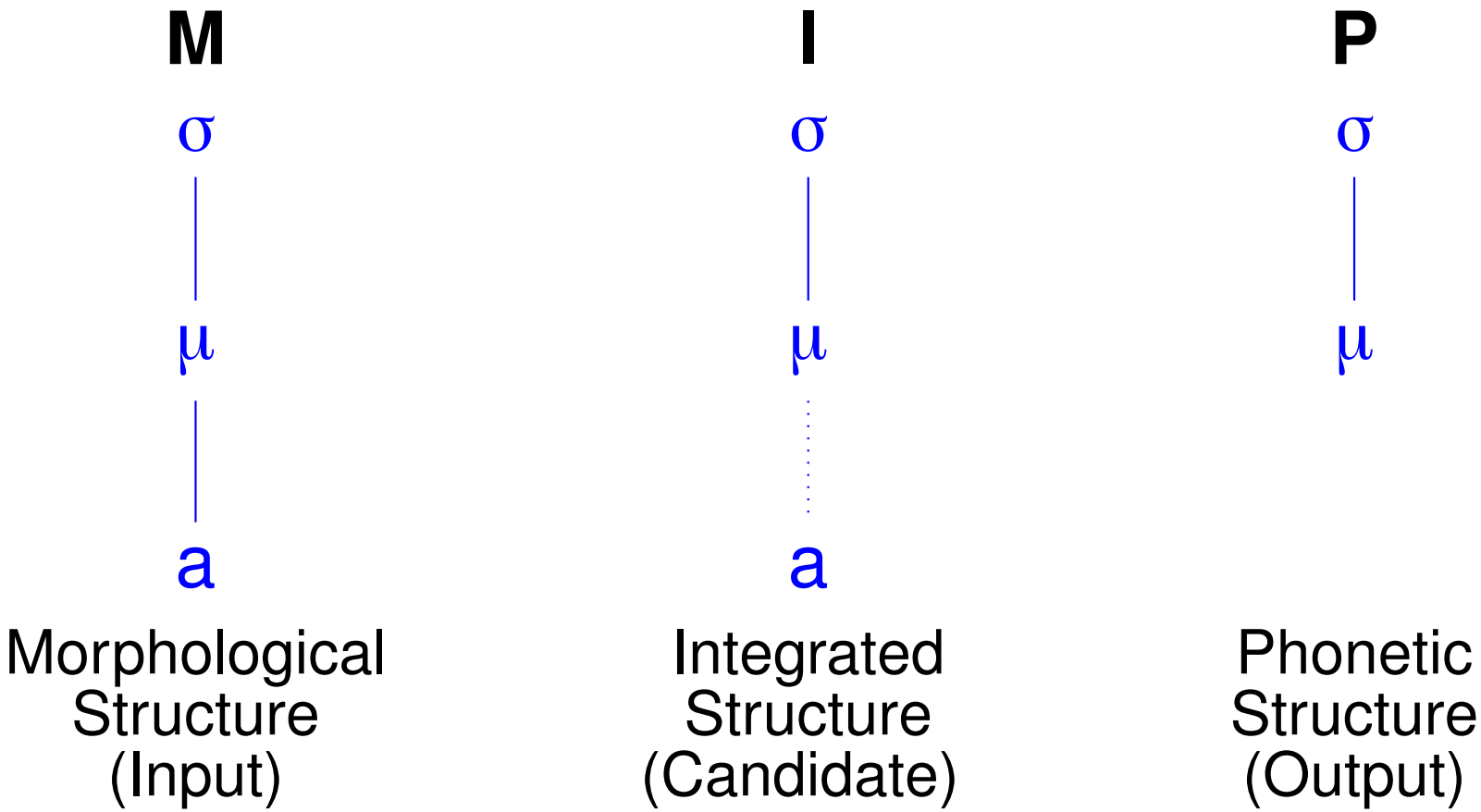
A phonological node is visible to phonetics

if and only if

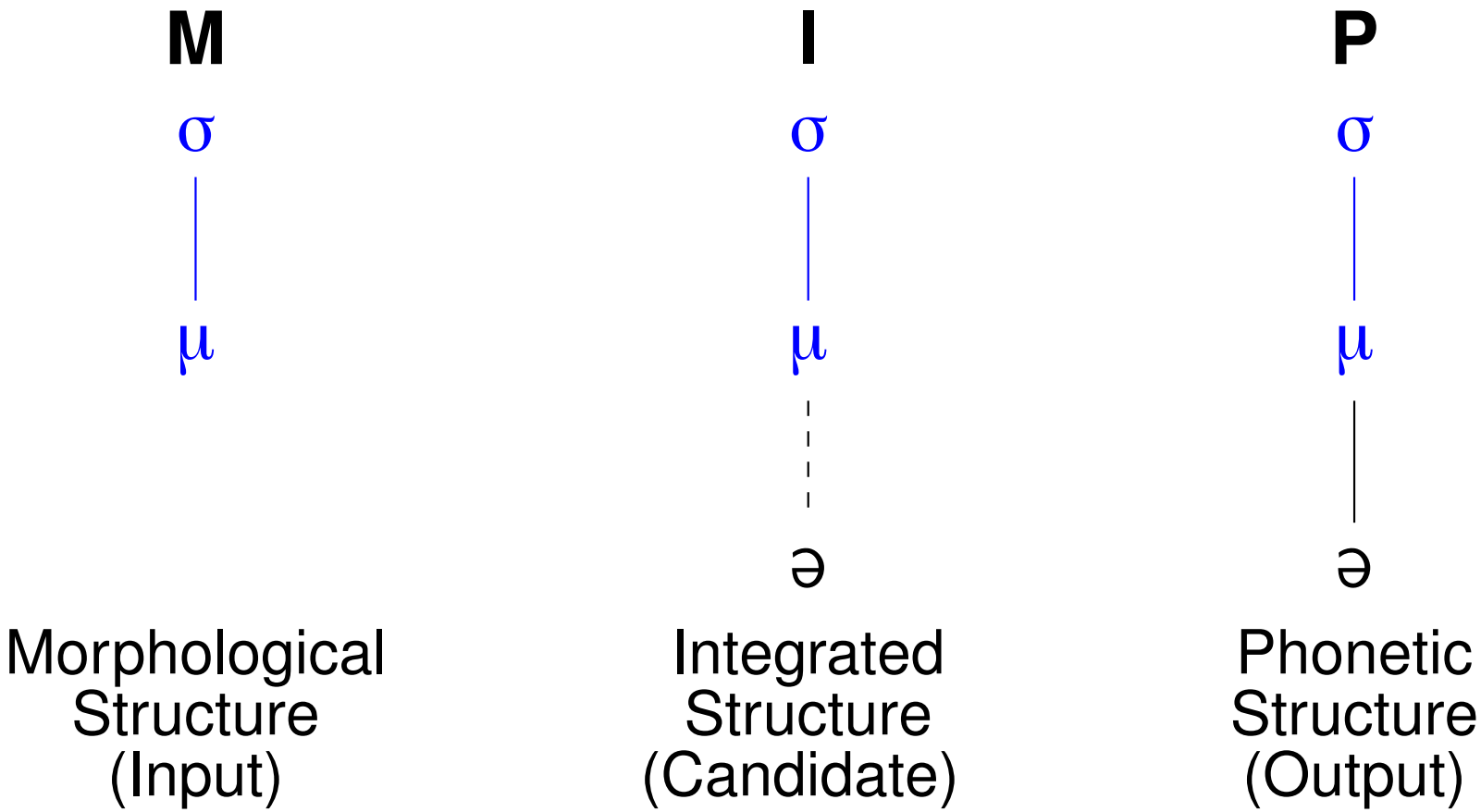
it is dominated by the designated ancestor node of the structure

through an uninterrupted path of phonetic association lines

Deletion


M
σ
μ
a
Morphological Structure (Input)
I
σ
μ
a
Integrated Structure (Candidate)
P
σ
μ
Phonetic Structure (Output)

Epenthesis


M
σ
μ
I
σ
μ
ə
P
σ
μ
ə
Morphological Structure (Input)
Integrated Structure (Candidate)
Phonetic Structure (Output)

The Cloning Hypothesis

Every markedness constraint exists in 2 incarnations:

The **general clone** refers to all structure in I

The **phonetic clone** refers only to structure in P

(cf. Cloning in Correspondence Theory, McCarthy & Prince 1995)

The Cloning Hypothesis

OCP Assign $*$ to every pair of adjacent L-tones in **P**

OCP Assign $*$ to every pair of adjacent L-tones in **I**

	OCP	OCP
a. L H L / mat wi ni		
b. L H L / mat wi ni	*	
c. L L / dep ke re	*	*

The Lateral Theory of Coalescence (Trommer 2016)

Phonology		**Phonetics**
H H	≈	H H
H- - -H	≈	H

The Lateral Theory of Coalescence (Trommer 2016)

Two laterally associated nodes are evaluated as identical

by phonological constraints on phonetic representations (**P**)

and by phonetic spellout

Basic Analysis

Basic Observations on Nouns

- All syllables **preceding** an accented syllable are **High**
- All syllables **following** an accented syllable are **Low**
- All other syllables are **Low**

Unaccented vs. Accented Nouns (Pulleyblank 1986:165)

Unaccented		**Accented**	
ì bù sù	‘flour’	**í bú sì**	‘smoke’
ì mù ntù	‘person’	**í cí tòn**gà	‘Tonga language’
ì dà	‘stomach’	**í mú súnè**	‘ox’
ì bà sàkwà	‘boys, men’	**í mú lá là**	‘mamba’

Basic Analysis of Nouns

- Accented syllables are underlyingly associated to **Low**
  All other tones are epenthetic
- **Low** can spread to the right but not to the left
- Insertion of **High** due to the OCP

Constraints on Tone Epenthesis

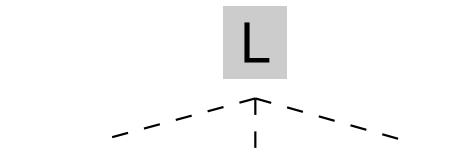
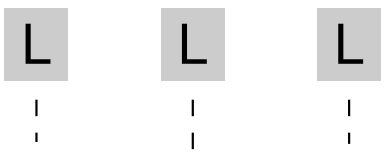
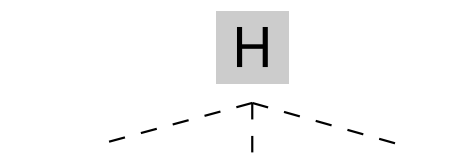
SPEC — Assign $*$ to every σ which is not associated to a tone in P

OCP — Assign $*$ to every **Low**-tone which is immediately preceded by another **Low**-tone on the same tier in P

*H — Assign $*$ to every colorless (epenthetic) H-tone

*L — Assign $*$ to every colorless (epenthetic) L-tone

Unaccented Noun

Input: = d.	SPEC	OCP	* H	* L
☞ a. 				*
b. 		*!*		
c. 			*!	
d. i mu ntu	*!**			

Constraints on Spreading

*SPREAD-RIGHT	Assign $*$ to every colorless (epenthetic) association line which follows a colored (underlying) association line inside the same Low-tone span
*SPREAD-LEFT	Assign $*$ to every colorless (epenthetic) association line which precedes a colored (underlying) association line inside the same Low-tone span

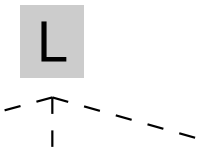
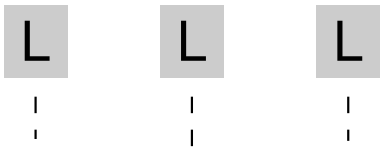
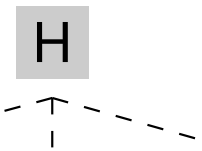
Precedence of Association Lines

An association line α_1 precedes an association line α_1 iff$_{def}$:

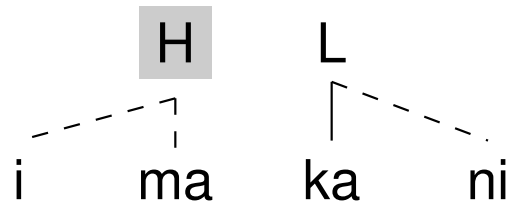
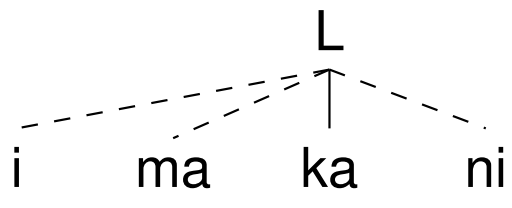
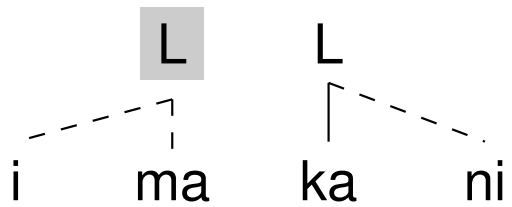
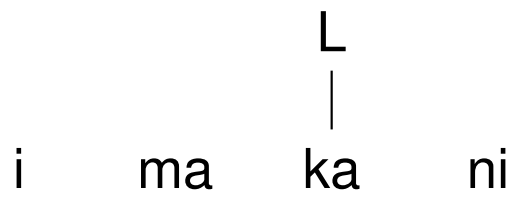
(1) **an** anchor node of α_1 precedes an anchor node of α_2 on the same tier

(2) **no** anchor node of α_2 precedes an anchor node of α_1 on the same tier

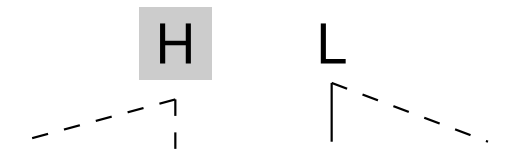
Unaccented Noun

Input: = d.	SPEC	OCP	*SPR$_L$	* H	* L	*SPR$_R$
☞ a. 					*	
c. 		*!*				
c. 				*!		
d. i mu ntu	*!**					

Accented Noun

Input: = d.	SPEC	OCP	*SPR$_L$	* H	* L	*SPR$_R$
☞ a. 				*		*
b. 			*!			*
c. 		*!			*	*
d. 	*!					

Accented Noun

Input: = c.	SPEC	OCP	*SPR$_L$	* H	* L	*SPR$_R$
☞ a. 				*		*
b. 				**!		
c. 	*!					

Verbs

(Pulleyblank 1986:169)

tù là làng à	tù là mù làng à
L | bà là làng à	L | tù là bà làng à
L L | | bà **lá** bòn à	L L | | tù là bà bòn à
L L | | bà **lá** **mú** bòn à	L L L | | | bà **lá** bà bòn à

Verbs – Basic Generalizations

- All finite verb forms start with **Low**
- Stretches of adjacent accented syllables are **Low**
- **High** occurs only on unspecified syllables between such stretches

Verbs – Basic Analysis

- Leftmost Lexical **Low** aligns to the left edge of verb constituents
- Adjacent **Low**'s coalesce and escape the OCP
- Non-adjacent **Low**'s cannot and must be separated by **High**

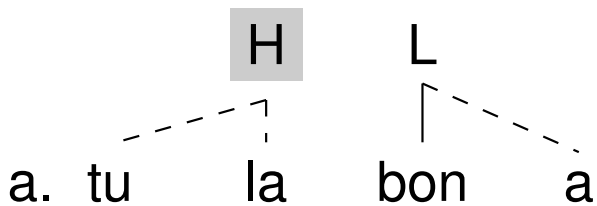
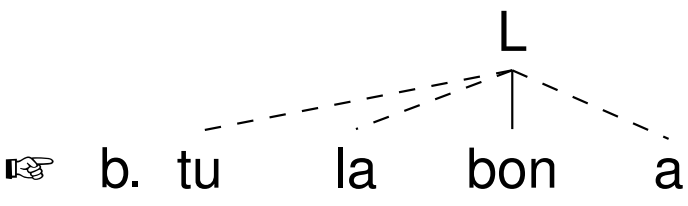
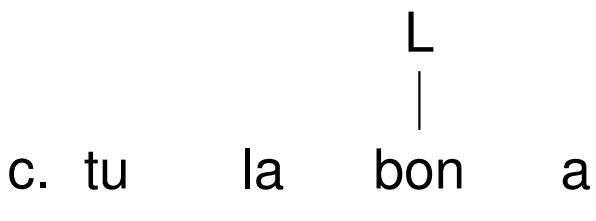
ALIGN-LEFT

Assign $*$ to every left edge of a **verb**

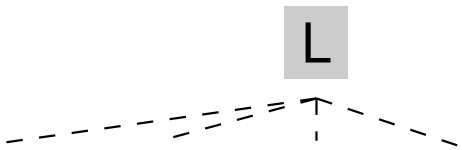
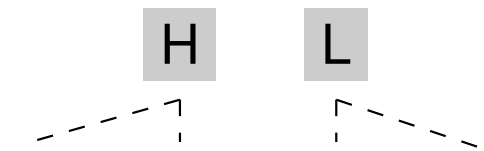
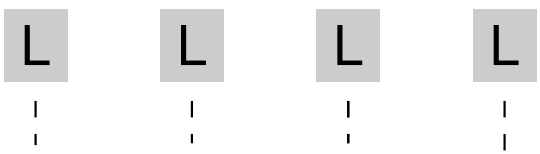
which is not associated at the left edge

of a **colored** (non-epenthetic) L-tone span

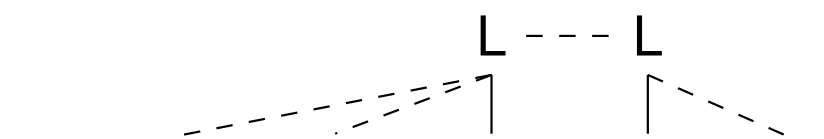
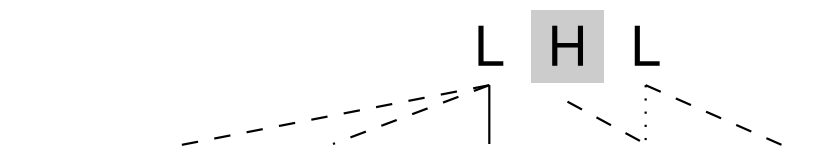
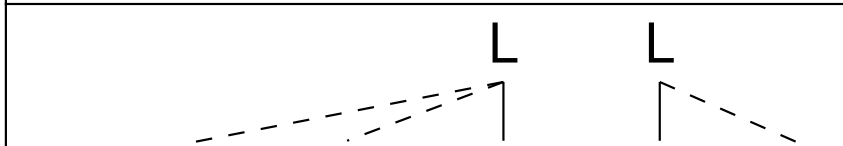
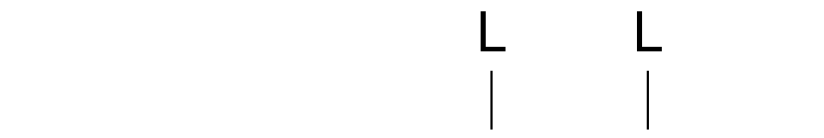
Verb with a single Accent

Input: = c.	SPEC	OCP	AL-L	*SPR$_L$	* H	* L
			*!		*	
				*		
	*!**					

Verb without Accent

Input: = d.	SPEC	OCP	AL-L	*SPR$_L$	* H	* L
☞ a. 			*			*
b. 			*		*!	*
c. 		*!**	*			****
d. tu la lang a	*!**		*	*		*

Verb with single Accent Stretch (L-Coalescence)

Input: = d.	SPEC	OCP	AL-L	*SPR$_L$	* H	* L	*- - -
☞ a. 				**			*
b. 				**	*!		
c. 		*!					
d. 	*!***	*!	*				

Verb with two Accent Stretches

Input: = d.	SPEC	OCP	AL-L	*SPR$_L$	* H	* L	*- - -
☞ a. L H L / ba la bon a					*		
b. L L / ba la bon a				*!			*
c. L L / ba la bon a	*!						*
d. L L / ba la bon a	*!*	*!					

Tonal Inflection

Markedness Reversal in Tonal Inflection

H-Tone	**L-Tone**
stable if floating	unstable if floating
spreading + overwriting	stationary

Stationary L-Tone: Remote Dependent Affirmative

	tù ká láng **è**	‘we looked at’
Unaccented:	**tù** ká tó**bèl** è	‘we followed’
	tù ká ján**dàù**l è	‘we looked for’
	tù ká **bòn è**	‘we saw’
Accented:	**tù** ká **sílìk** è	‘we cared for’
	tù ká **swílì** lìl è	‘we listened to’

(**L-** **-L** targeting the word-initial and the second stem mora)

Spreading + Overwriting H-Tone: Imperative

	láng è	‘look at!’
Unaccented:	**tóbél à**	‘follow!’
	jándáú**l à**	‘look for!’
	bón à	‘see!’
Accented:	**sílík à**	‘care for!’
	swílì**líl à**	‘we listen to!’

(Circumfixal **H-** **-H L** targeting the word edges)

Unstable Floating L: Recent Past

Floating L Floating:	ù**á**bònà	ù**á**ndíbònà	ù**á**bàbònà
	ùàlàngà	ùàndìlàngà	ù**á**bàlàngà
Floating L Realized:	**ndà**b**ó**nà	**ndà**kúbònà	**ndà**b**á**bònà
	ndàlàngà	**ndà**kùlàngà	**ndà**b**á**làngà

(Prefixal (L)**-**)

Stable Floating H: Hortative Affirmative

kà**mùbónà**	kà**mùndíbònà**	kà**mùbàbónà**
kà**mùsílíkà**	kà**mùndísìlíkà**	kà**mùbásílíkà**
kà**mùswíílílà**	kà**mùndíswìílílà**	kà**mùbáswíílílà**
kà**mùbónà**	kà**mùndíbònà**	kà**mùbàbónà**

kà**mùlángà**	kà**mùndílàngá**	kà**mùbálángà**
kà**mùtóbélà**	kà**mùndítóbélá**	kà**mùbátóbélà**
kà**mùjándáúlà**	kà**mùndíjándáúlá**	kà**mùbájándáúlà**

(Circumfixal **L-** **H**- -**H** **L**)

H-Specific Constraints

$\textsc{Contiguity}_{H}$	Assign $*$ to every pair of tautomorphemic H-tones which are not associated to adjacent syllables in I
$H \rightarrow \sigma$	Assign $*$ to every H-tone which is not associated to a syllable in I

Positional Faithfulness Constraints

MAX τ^{σ} — Assign $*$ to every tone which is associated in M but not in P

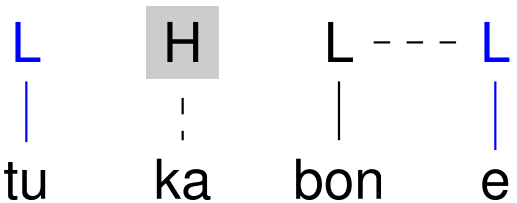
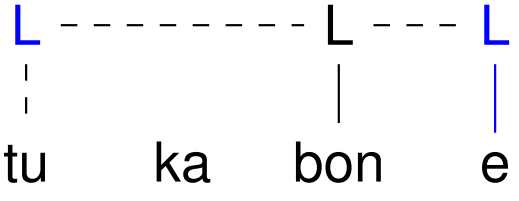
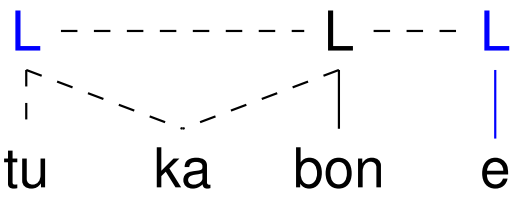
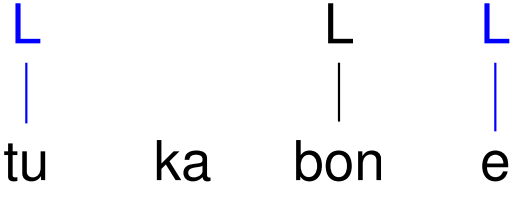
MAX $[\tau$ — Assign $*$ to every tonal onset in M which is not associated in P

Stationary L-Tone: Remote Dependent Affirmative

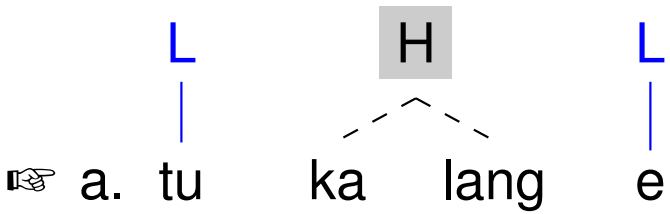
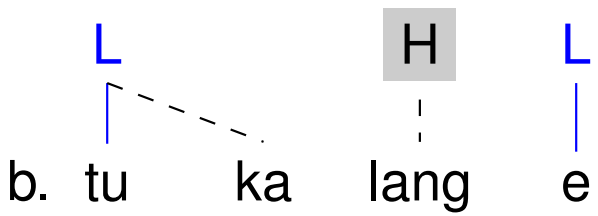
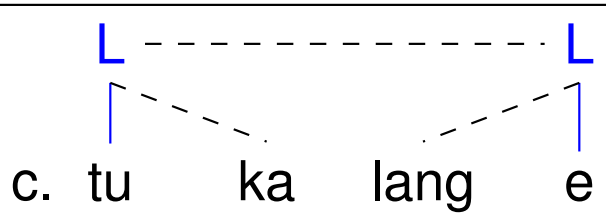
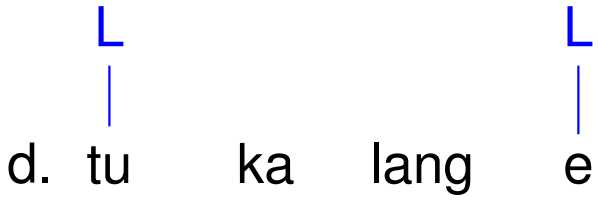
	tù ká láng **è**	‘we looked at’
Unaccented:	**tù** ká tó**bèl** è	‘we followed’
	tù ká ján**dàù**l è	‘we looked for’
	tù ká **bòn è**	‘we saw’
Accented:	**tù** ká **sílìk** è	‘we cared for’
	tù ká **swílì** lìl è	‘we listened to’

(**L-** **-L** targeting the word-initial and the second stem mora)

Remote Dependent Affirmative (Root-L)

Input: = d.	SPEC	OCP	AL-L	CON_{H}	$*\text{SPR}_{\text{L}}$	* H	* L
☞ a. 						*	
b. 	*!						
c. 					*!		
d. 	*!	**!					

Remote Dependent Affirmative (Root-Ø)

Input: = d.	SPEC	OCP	CON_{H}	$*\text{SPR}_{\text{L}}$	* H	* L	$*\text{SPR}_{\text{R}}$
☞ a. 					*		
b. 					*		*!
c. 				*!*			**
d. 	*!*	*!					

Spreading + Overwriting H-Tone: Imperative

	láng è	‘look at!’
Unaccented:	**tóbél à**	‘follow!’
	jándáú**l à**	‘look for!’
	bón à	‘see!’
Accented:	**sílík à**	‘care for!’
	swílì**líl à**	‘we listen to!’

(Circumfixal **H-** **-H L** targeting the word edges)

Imperative

Input: = d.	OCP	H → σ	MAX [τ	CON$_H$	*SPR$_L$	MAX τ^σ	*SPR$_R$
☞ a. 						*	
b. 				*!			*
c. 			*!			*	*
d. 		*!		*			

Unstable Floating L: Recent Past

Floating L Floating:	ù**á**bònà	ù**á**ndíbònà	ù**á**bàbònà
	ùàlàngà	ùàndìlàngà	ù**á**bàlàngà
Floating L Realized:	**ndà**b**ó**nà	**ndà**kúbònà	**ndà**b**á**bònà
	ndàlàngà	**ndà**kùlàngà	**ndà**b**á**làngà

(Prefixal (L)**-**)

UNIFORMITY

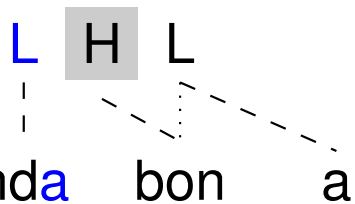
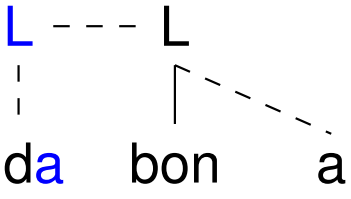
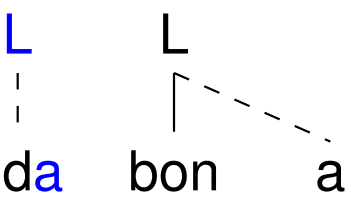
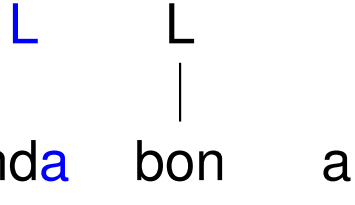
Assign $*$ to every lateral association line

between two tones τ_1 and τ_2 where:

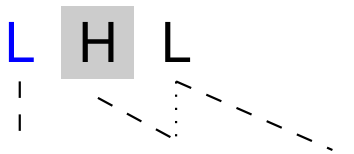
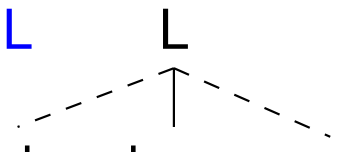
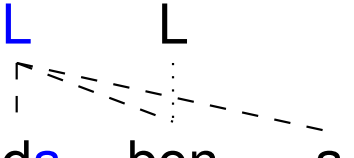
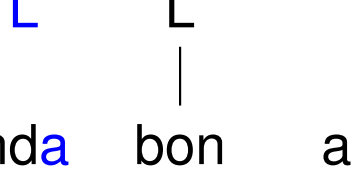
(1) τ_1 is morphologically (underlyingly) **associated**, and

(2) τ_2 is morphologically (underlyingly) **floating**

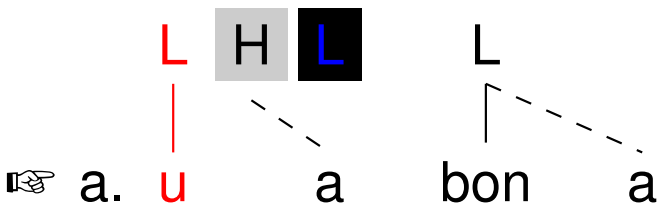
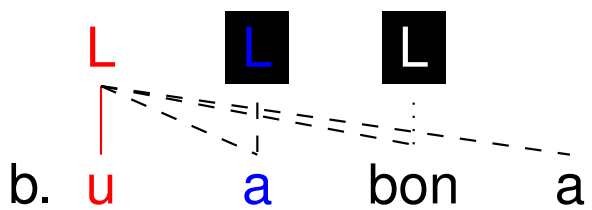
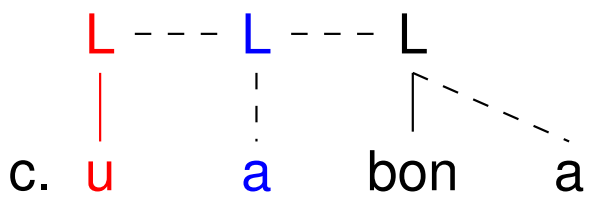
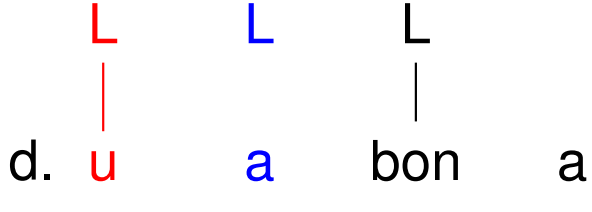
Recent Past: H-Tone on L-Tone Verb

Input: = d.	SPEC	OCP	AL-L	UNI	*SPR$_L$	* H	* L	*- - -
☞ a. 						*		
b. 				*!				*
c. 		*!						
d. 	*!*	*						

Recent Past: H-Tone on L-Tone Verb

Input: = d.	SPEC	OCP	AL-L	UNI	*SPR$_L$	MAX τ^σ	* H	* L
 ☞ a.						*		
 b.					*!			*
 c.						*!		*
 d.	*!*	*						

Recent Past: H-Tone on Tense Prefix

Input: = d.	SPEC	OCP	AL-L	UNI	*SPR-L	MAX τ^{σ}	* H	* L
☞ a. 							*	
b. 						*!		
c. 				*!				
d. 	*!*	*!						

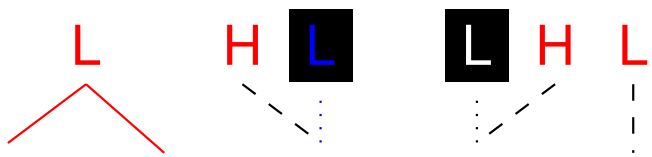
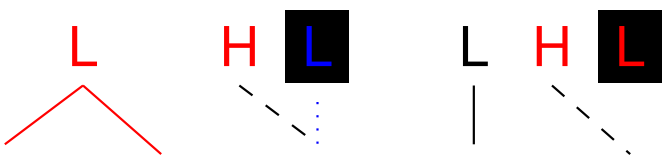
Stable Floating H: Hortative Affirmative

kà**mùbónà**	kà**mùndíbònà**	kà**mùbàbónà**
kà**mùsílíkà**	kà**mùndísìlíkà**	kà**mùbásílíkà**
kà**mùswíílílà**	kà**mùndíswìílílà**	kà**mùbáswíílílà**
kà**mùbónà**	kà**mùndíbònà**	kà**mùbàbónà**

kà**mùlángà**	kà**mùndílàngá**	kà**mùbálángà**
kà**mùtóbélà**	kà**mùndítóbélá**	kà**mùbátóbélà**
kà**mùjándáúlà**	kà**mùndíjándáúlá**	kà**mùbájándáúlà**

(Circumfixal **L-** Ⓗ**-** **-**Ⓗ Ⓛ)

Hortative Affirmative: Full Overwriting

Input: = d.	OCP	H → σ	MAX [τ	CON$_H$	MAX τ^σ
☞ a. 					*
c. 				*!	
d. 	*!*	*!*			

Hortative Affirmative: Partial Overwriting

Input: = d.	OCP	H → σ	MAX [τ	CON$_H$	MAX τ^σ
☞ a. L H L H L / ka mu ndi bon a				*	*
c. L H L H L / ka mu ndi bon a			*!		
d. L H L H L / ka mu ndi bon a	*!	*!*			

Summary

- One more language with **privative** marked (underlyingly specified) **Low tone**
- Unmarked default tone depends on **context** – no unitary default tone
- Markedness **reversal** in morphological tone

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Goldsmith, J. (1984). Tone and accent in Tonga. In Clements, G. N. and Goldsmith, J., editors, *Autosegmental Studies in Bantu Tone*, pages 19–52. Mouton De Gruyter, Berlin, New York.

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Pulleyblank, D. (1986). *Tone in Lexical Phonology*. Reidel, Dordrecht.

Overview

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- Tonga
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Basic Analysis
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- Verbs

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- Remote Dependent Affirmative
- Imperative
- Recent Past
- Hortative Affirmative