



**University of
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Phonology

Part III:

Nonlinear phonology (with a focus on tone)

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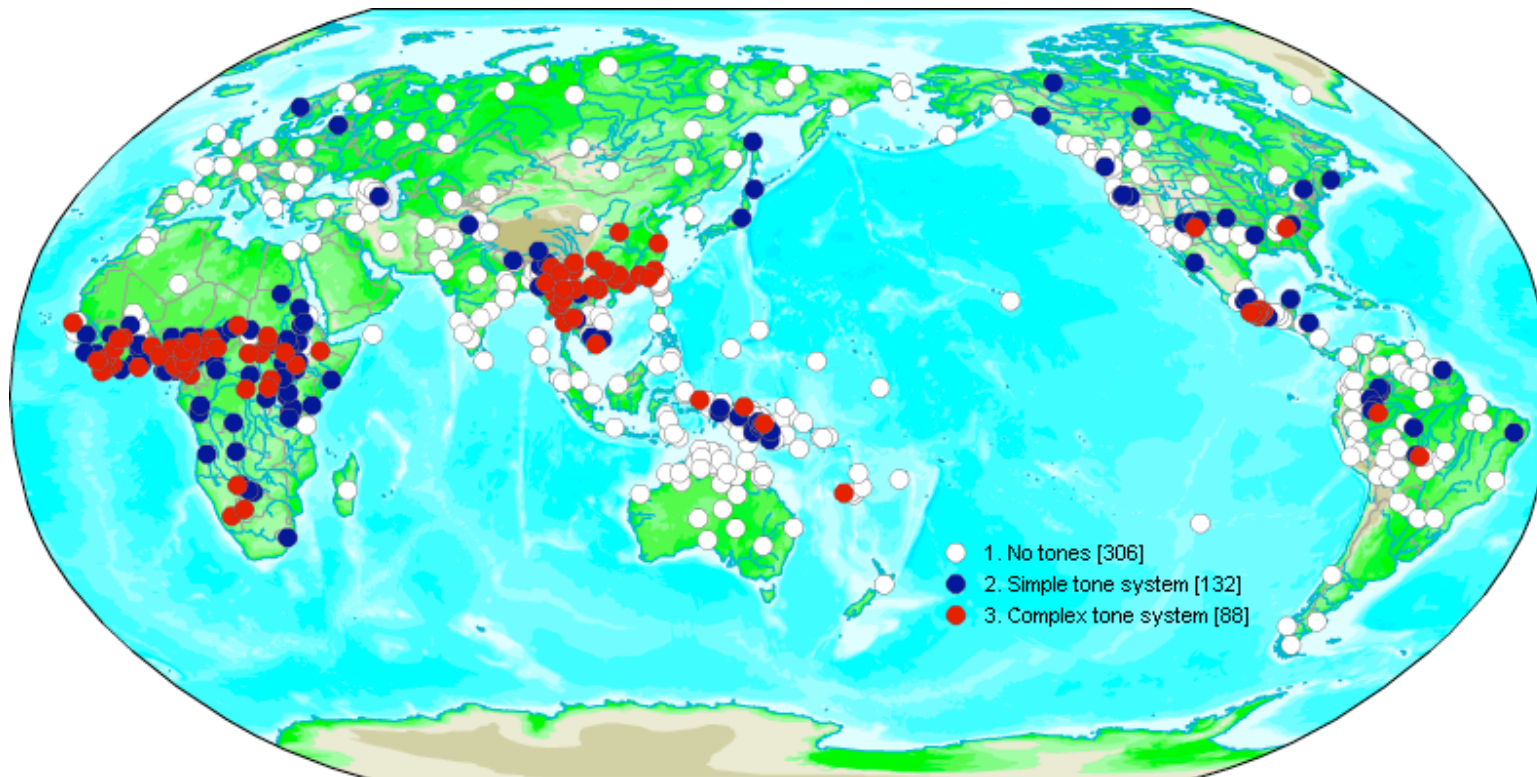
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Tone languages

- Definition: “Tone is the term used to describe the use of pitch patterns to distinguish individual words or the grammatical forms of words” (Maddieson 2005)
- Tone types:
 - register tones: flat pitch, no pitch changes over the duration of a syllable (e.g. high, low)
 - contour tones: pitch changes over the duration of a syllable (e.g. rising, falling); some contour tones can be analyzed as consisting of a sequence of register tones (e.g. rising tone = low tone + high tone)

Distribution of tone languages

WALS map 13 (Maddieson 2005)



Distribution of tone languages

- Africa: the vast majority of languages spoken in sub-Saharan Africa
 - Europe: distinctive tones marginal, e.g. Lithuanian, Swedish
 - Asia: most languages of China and mainland Southeast Asia
 - New Guinea: the majority of the Papuan (i.e. non-Austronesian) languages
 - Americas: some North American languages, the majority of the Meso-American languages, some languages of South America
 - Australia: no tone languages
- Tone languages are common among the world's languages, probably more than 50% of all languages are tone languages

Transcription of tones

	IPA 1 / Africa	IPA 2	(S)E Asia	Meso- America
extra high	ǎ	ᵗ a	a ⁵⁵	a ¹
high	á	ᵗ a	a ⁴⁴	a ²
mid	ā	ᵗ a	a ³³	a ³
low	à	ᵗ a	a ²²	a ⁴
very low	ǎ	ᵗ a	a ¹¹	a ⁵
rising	ǎ	ˆ a	a ¹⁵	a ⁵⁻¹
falling	â	˘ a	a ⁵¹	a ¹⁻⁵

Function of tones

Lexical tone

Tone change → different word

example: Izi (Benue-Congo, Nigeria):

/ézi/ 'tooth' vs /ézi/ 'chief'

Grammatical tone

Tone change → change of the grammatical category

example: Izi:

/óò pfú/ 'he speaks' vs /óó pfú/ 'he will speak'

Nonlinear representation

Autosegmental (or suprasegmental) representation

- Segmental features and tone features are represented on different levels (> Leben 1973, Goldsmith 1976)
- Advantage: in many languages tone behaves differently from segments

Representation

segmental tier: tone bearing unit (TBU)	e.g. [-cons, +son]
association line	
tone tier	e.g. [+high]

Distinctive features

2 level systems: [+/-high] 3 level systems: [+/-high], [+/-low]
4 level systems: [+/-high], [+/-upper]

Tone stability

(1) **Metathesis of TBUs:**

Play language of Bakwiri (Bantu, Cameroon):

/k^w e l i/ → /l i k^w e/ ‘falling’

H	L	H	L

(2) **Deletion of TBUs:**

Margi (Chadic, Nigeria): /úʔw+ǎri/ ‘fire (DEF)’

/u ʔ u + a r i/ → /u ʔ w + a r i/ → /u ʔ w + a r i/

H	L	H	L	H	Ⓛ	H	L	H	Ⓛ	H	L

Ⓛ: Floating tone: associated with the following vowel

Tonal processes

- Assimilation
- Dissimilation
- Substitution
- Downstep

Assimilation/dissimilation

- Vertical assimilation:

H L → M L

H L H → H L ^lH (Downdrift)

- Horizontal assimilation:

H L → H HL (progressive)

H L → HL L (regressive)

- Dissimilation: rare, e.g. in Hausa (Chadic, Nigeria):

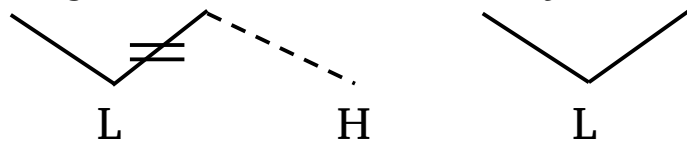
/káràntà/ → [káràntá] 'read'

Substitution

- An underlying toneme of a morpheme is replaced in certain contexts through another toneme
- Example: Central Igbo

/àgbà/ ‘mouth, snout’ + /èṅwè/ ‘monkey’ → [àgbá#èṅwè] ‘snout of a monkey’

/a g b a + POSS + e ṅ w e/



Downstep

Development: When a segment is deleted, a floating low tone emerges. This floating tone is not represented on the surface but lowers the following high tone to some degree:

H L H → H (L) H → H ↓H

Association of tones

Rules (simplified and generalized)

- Associate tones with TBUs on a one-to-one basis from left to right
- Associate remaining TBUs with the last tone
- Associate remaining tones with the last TBU

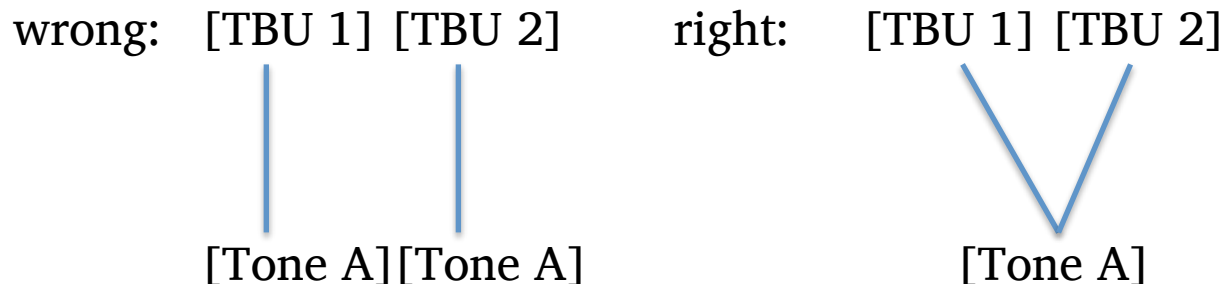
Thus, it is possible that

- one TBU has to associated with several tones
- one tone has to associated with several TBUs

Association of tones

Further rules

- No Crossing Constraint:
Association lines must not cross
- Obligatory Contour Principle:
Adjacent tones must not be identical



Example: Luganda

Tone processes across words (Hyman&Katamba 2010)

LTD and HTP also apply postlexically (*italics* = post-verbal focus)

- a. báálàbà + kibê → báálábá kibê ‘they saw *a jackal*’ (P₂)
 b. báálàbà + kikópò → báálábá kikópò ‘they saw *a cup*’
 c. báálàbà + kisikî → báálábá kisikî ‘they saw *a log*’
 d. báálàbà + kisásilo → báálábá kisásiló ‘they saw *rubbish*’
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- (we indicate a single tone under báá- for graphic convenience)

Influencing tone development

- Consonants in the environment:
 - raising the pitch: voiceless obstruents (plosives and fricatives), glottal stop
 - lowering the pitch: voiced obstruents, [h]
 - raising or lowering the pitch: sonorants
- adjacent tones
- accent and vowel length
- position in the word or in a bigger prosodic unit
- syllable type
- vowels: [i u] → raising; nasalization, aspiration → raising or lowering

Vowel harmony

Vowel harmony in Luganda:

nonlinear (autosegmental) analysis by Katamba (1984)

Example:

<i>Noun</i>	<i>Adjective</i>
e-ki-tabo	e-ki-nene (prepref.-cl. 7 pref.-stem) 'big book'
o-mu-kazi	o-mu-nene (prepref.-cl. 1 pref.-stem) 'big woman'
a-ma-gi	a-ma-nene (prepref.-cl. 6 pref.-stem) 'big eggs'

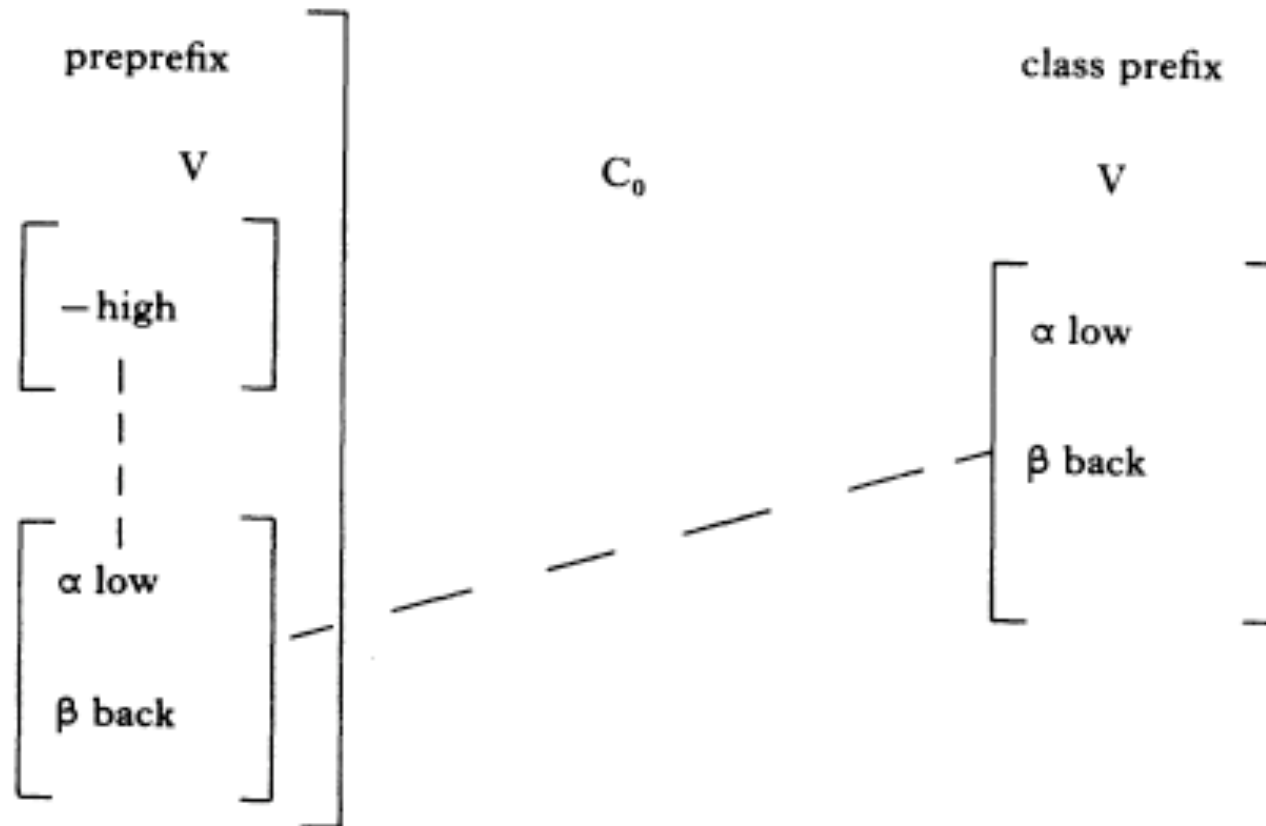
Vowel harmony

Vowel harmony in Luganda: linear analysis

$$\begin{bmatrix} \text{V} \\ \text{-high} \end{bmatrix} \rightarrow \begin{bmatrix} \alpha \text{ back} \\ \beta \text{ low} \end{bmatrix} / \text{---} + \text{C}_0 \begin{bmatrix} \text{V} \\ \alpha \text{ back} \\ \beta \text{ low} \end{bmatrix}$$

Vowel harmony

Vowel harmony in Luganda: nonlinear analysis



Thank you!