

## Towards a Typology of Linguistic Rhythm

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### 1. Introduction

- Traditionally, rhythmic differences between languages have been attributed to the tendency towards isochrony of the prosodic domains of the foot (1), the syllable (2), and the mora (3), respectively.

(1)	[ <sup>1</sup> Which is the] [ <sup>1</sup> train for] [ <sup>1</sup> Crewe], [ <sup>1</sup> please]?	English (Abercrombie 1967: 98)
(2)	<i>C'est absolument ridicule</i>	French (Abercrombie 1967: 98)
(3)	a. C <sub>[-voice]</sub> [ <sup>•</sup> s-te-ru]     'throw away'	Japanese (Bloch 1950: 91)
	b. N <sup>•</sup> [hō-ŋ <sup>•</sup> ]            'book'	
	c. V             [o-mu-u]            'thinks'	
	d. CV <sub>̩</sub> [s <sup>•</sup> u-su-mu]        'advances'	
	d. CV           [to-ko-ro]          'place'	
	e. CCV          [k <sup>•</sup> ya-ku]            'guest'	

- Counter to the predictions made within this conception of linguistic rhythm, isochrony of prosodic domains as exemplified above cannot be measured in the phonetic signal (e.g. Roach 1982, Beckman 1982, Dauer 1983).
- On the other hand, perceptual studies underpin the psychological reality of the distinctions between rhythmic types (Lehiste 1977, Donovan & Darwin 1979, Ramus, Nespor & Mehler 1999, Cutler & Mehler 1993, Cutler 1999).
- One way to resolve this apparent contradiction is to attribute the differences between the rhythm types to the phonological properties of the languages which add up to different rhythmic profiles (Bertinetto 1977, Dauer 1987, Auer & Uhmman 1988, Auer 1993, Auer 2001, Dufter 2003).
- In this talk, ten of the phonological parameters which have been discussed in the typological literature on linguistic rhythm will be tested against data from a variety sample of nineteen languages.

## **2. Testing parameters for a typological study of rhythm**

- The phonetic strength of accent can be measured by the phonetic correlates which are utilized in the production of stress, i.e. pitch, duration and intensity. The languages of the sample pattern in increasing order with respect to this parameter of linguistic rhythm.
- Segmental effects of stress are instanced in vowel reduction in unstressed syllables, vowel lengthening in stressed syllables and consonant alternation which are triggered by the presence and absence of stress. The increase of phonetic strength is accompanied by the increase of segmental stress effects over the languages of our sample.
- Stress placement does not provide a useful parameter for the study of rhythm: no language in the sample has ‘free’ stress placement, only three languages, namely Tariana, Catalan, and Amele exhibit morphologically conditioned placement.
- On the basis of the published resources, the tone-bearing unit cannot easily be established for the tone languages of the sample. In !Xóõ the mora acts as the TBU, in Nigerian Pidgin and Mandarin Chinese the foot. However, unrestricted tone systems are only documented for languages without stress.
- The degree of syllable complexity shows a rather erratic distribution over the languages on the stress cline. If at all, we can observe a gradual increase in syllable complexity with increase phonetic strength and segmental effects of stress.
- Vowel length is encountered all over the cline. Geminates, however, show a rather restricted distribution. With the noteworthy exception of Maltese, only languages with weak stress or lacking stress show length contrasts in consonants.
- Since only one language of our sample, Georgian, has been reported to have variable syllable division, this parameter cannot be used to typologize linguistic rhythm.

- Assimilation across consonant clusters is documented for thirteen languages. Only two languages, Yoruba and Maori, have such low degrees of syllable complexity that consonant clusters and associated processes are not possible.
- With respect to hiatus resolution, processes of consonant epenthesis and vowel deletion are evidenced across the entire cline. However, languages with little or no strength and segmental effect of stress seem to employ more rules to resolve hiatus.
- Although vowel harmony processes are instanced across the entire stress cline, only three languages with weak accent and little segmental effect of stress exhibit word-spanning vowel harmony: Chukchi, Finnish and Udihe.

### **3. Conclusions**

- The concept of rhythmic classes can only be maintained if one isolates prototypical representatives like West Greenlandic, Chukchi, and Catalan. The evidence presented here, however, suggests gradual differences across languages.<sup>1</sup>
- Whereas the stress cline may be considered a primary indicator of linguistic rhythm, the distribution of morphophonological parameters follows only secondarily. For instance, word-spanning vowel harmony and vowel reduction in unstressed syllables seem to be mutually exclusive.
- Following the diachronic scenario for the evolution of word stress proposed by Hyman (1977) and elaborated by Bybee et al. (1998), the continuum of linguistic rhythm discussed above may be interpreted as an evolutionary cline.

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<sup>1</sup> This is also compatible with the phonetic evidence from Ramus, Nespors & Mehler 1999 and Grabe & Low 2002 among others.

- (4) A possible diachronic scenario:
- i) Reinterpretation of phrasal intonation as word stress.
  - ii) Innovation of duration as a phonetic correlate of stress.
  - iii) Development of segmental effects of stress.
  - iv) Loss of unstressed syllables/increase in syllable complexity.
  - [v) The basis for the evolution/loss of secondary indicators, such as vowel harmony.]
- However, to substantiate this view, more careful diachronic evidence needs to be studied. In principle, there is no basis to formulate (unidirectional) hypotheses for the diachronic development of all the parameters tested above.

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## Language Sample

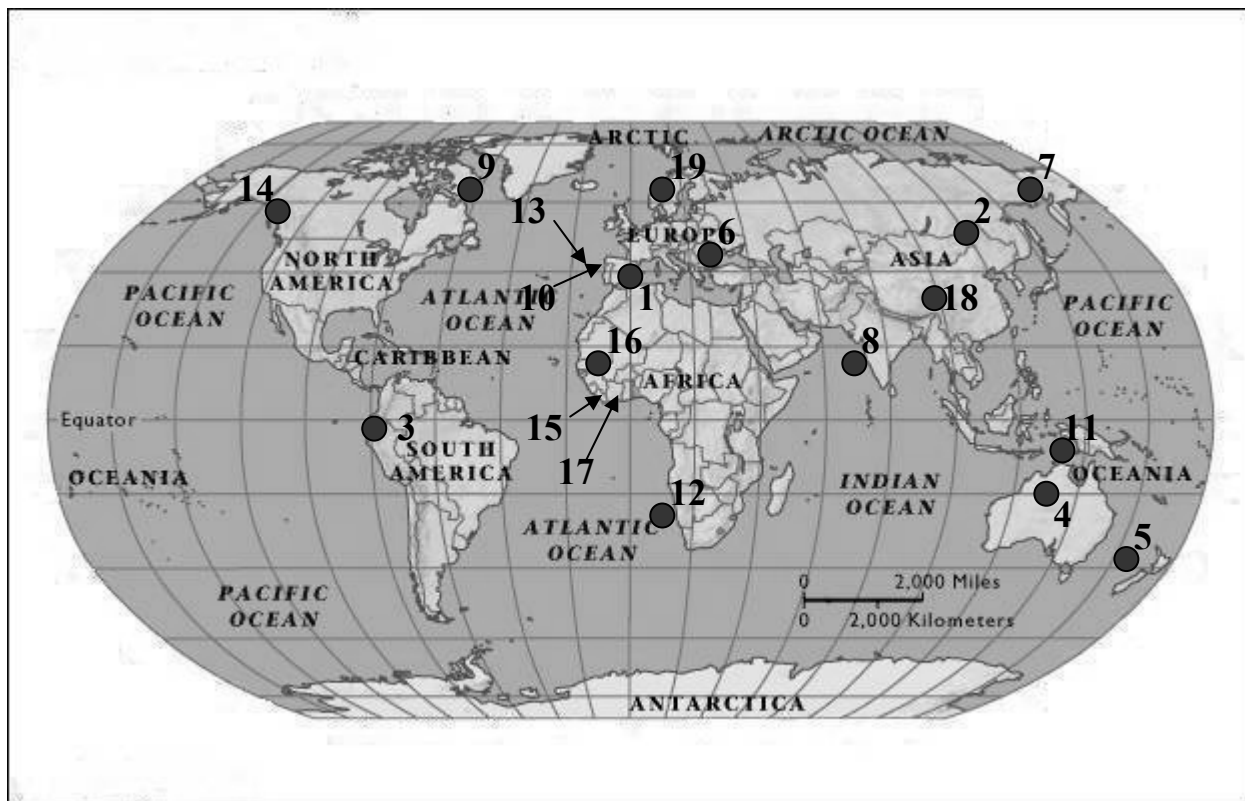


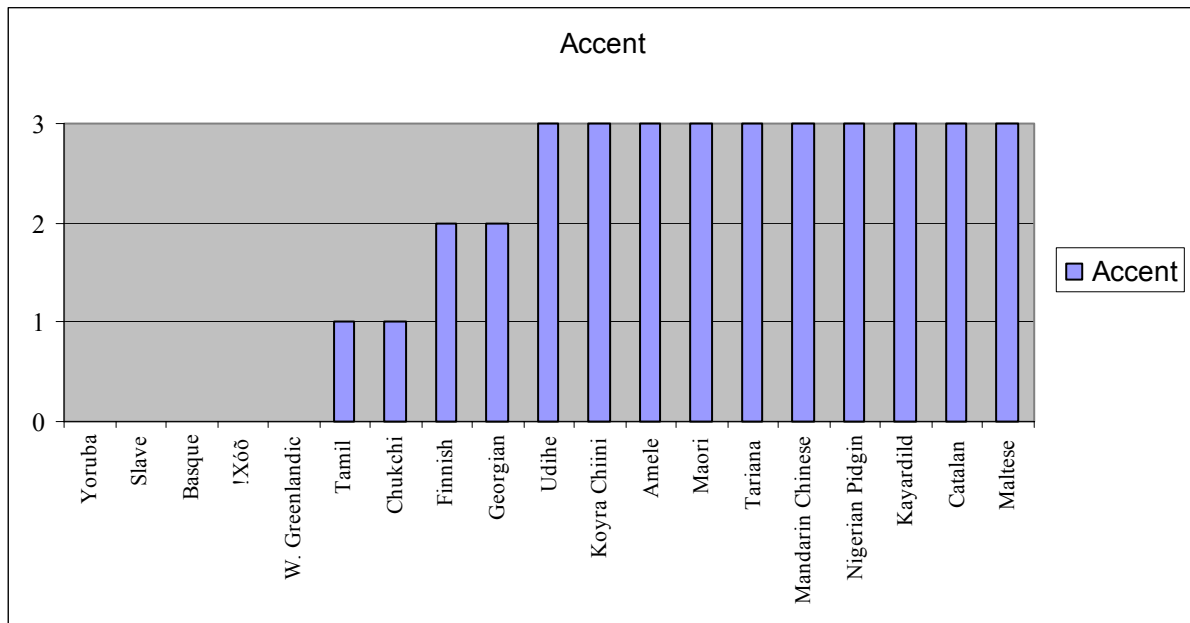
Table 1: Language Sample

Nr.	Language	Macroarea, Area	Classification
1	Maltese	Europe, Malta	Semitic
2	Udihe	Eurasia, Eastern Siberia	Tungus-Manchu
3	Tariana	South America, Northwest Amazonia	Arawak
4	Kayardild	Australia, Queensland	Tangkic
5	Maori	Oceania, New Zealand	Polynesian
6	Georgian	Eurasia, Georgia, Turkey, Iran	Kartvelian
7	Chukchi	Eurasia, North Eastern Siberia	Chuckchi-Kamchatkan
8	Tamil	Asia, India	Dravidian
9	West Greenlandic	Europe, Greenland	Eskimo-Aleut
10	Catalan	Europe, Spain, France, Sardinia	Romance
11	Amele	Oceania, Papua New Guinea	Gum
12	!Xóǀ Bushman	Africa, Botswana, Namibia	Southern Khoisan
13	Basque	Europe, Spain, France	Language Isolate
14	Slave	North America, Canada	Na-Dene
15	Yoruba	Africa, Nigeria	Niger-Congo
16	Koyra Chiini	Africa, Mali, Timbuktu	Songhai
17	Nigerian Pidgin	Africa, Nigeria	Pidgin, English-Based
18	Mandarin Chinese	Asia, China	Sinitic
19	Finnish	Europe, Finland	Uralic

**Phonological parameters proposed for a typological study of rhythm**

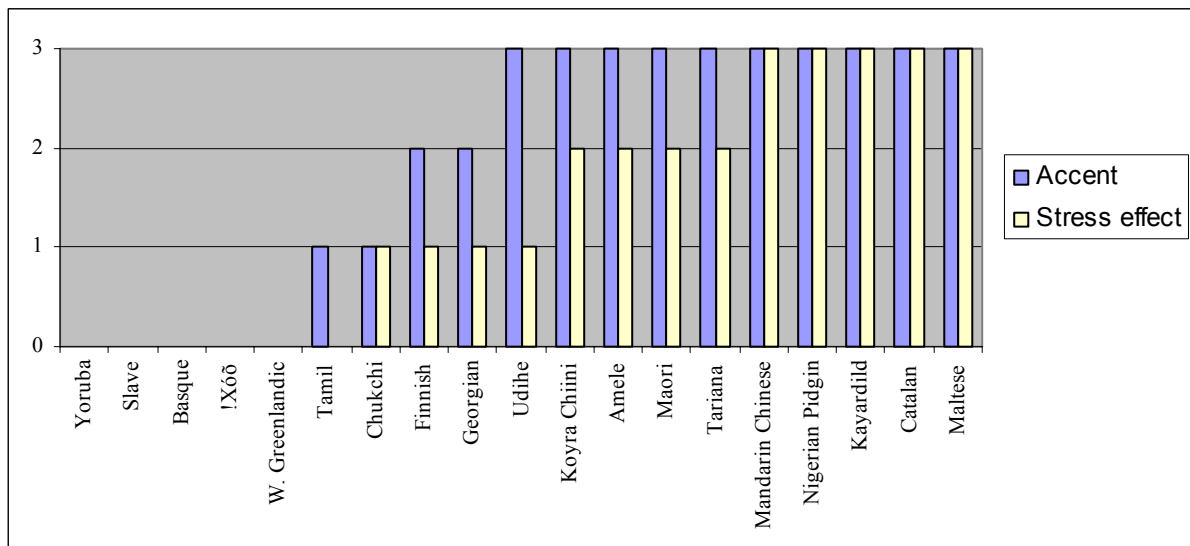
		mora-based	syllable-based	stress-based
i)	Accent	non-stress accent (pitch)		stress accent (pitch, duration, amplitude)
ii)	Stress effects		(none)	vowel reduction vowel lengthening consonant changes
iii)	Stress placement	(none)	fixed predictable	free unpredictable
iv)	Tone distribution Tone-bearing unit	mora	unrestricted syllable	restricted foot
v)	Syllable complexity Sonority		low obeyed	high disobeyed
vi)	Length contrasts	in all syllables		not in unstressed syllables
vii)	Syllable division		unambiguous	ambiguous
viii)	Assimilations		few	frequent
ix)	Cluster resolution		yes	no
x)	Vowel harmony		possible	no

### Phonetic Strength of Accent



0 = no stress, 1 = only pitch, 2 = pitch & duration, 3 = pitch, duration & amplitude

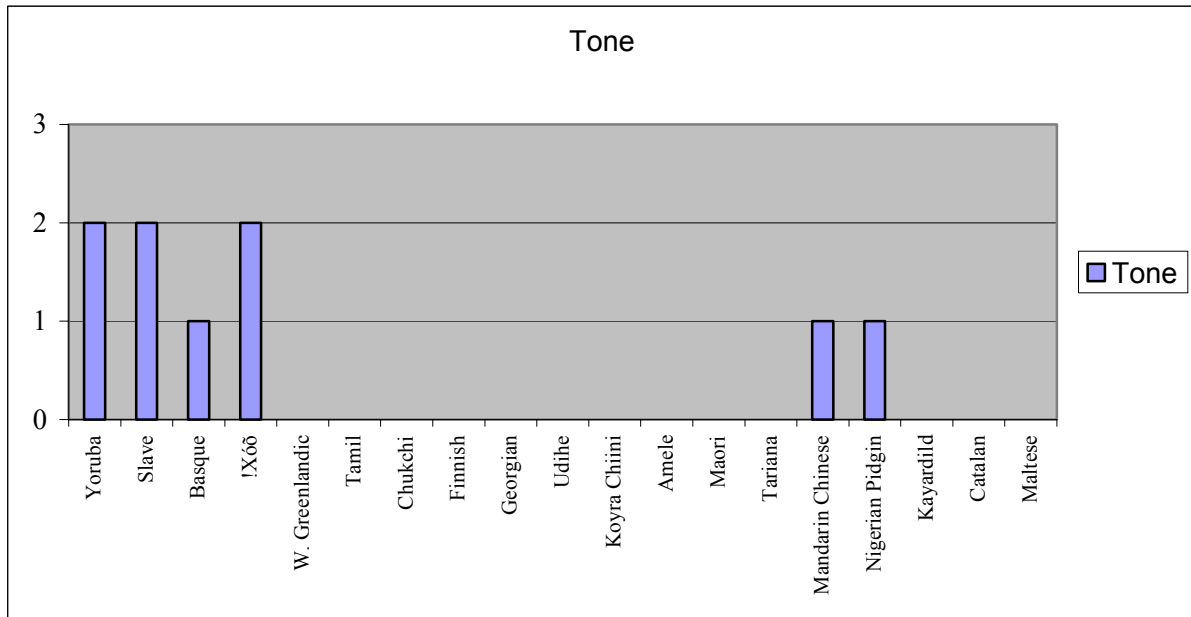
### Phonetic Strength of Accent & Segmental Effects of Stress



0 = no stress, 1 = either vowel reduction or vowel lengthening or consonant alternations,

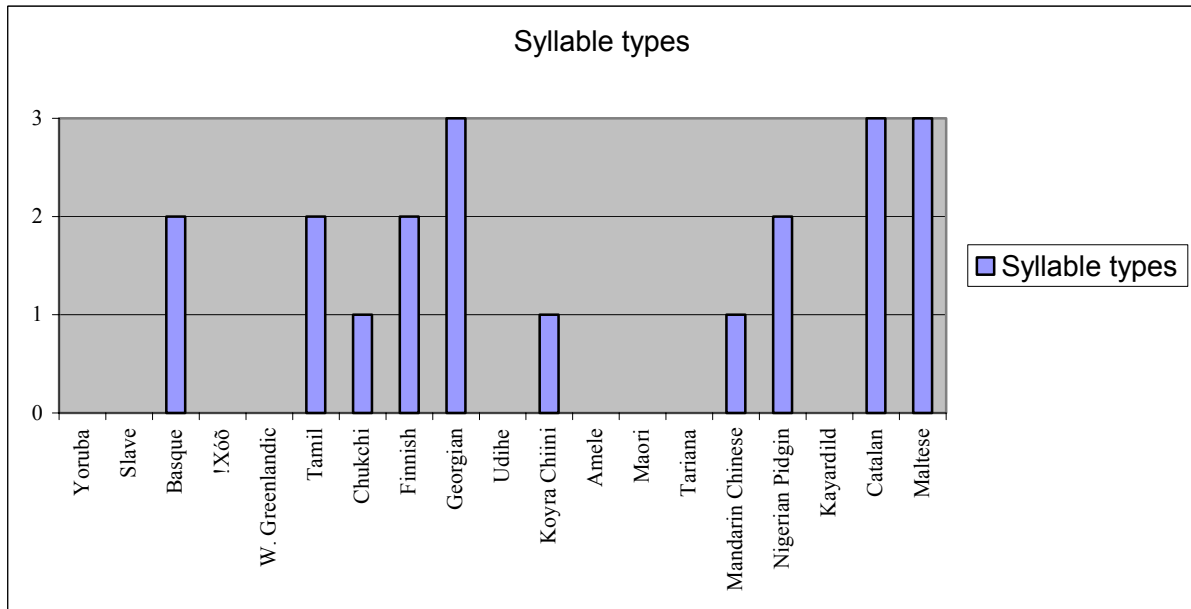
2 = combination of two, 3 = vowel reduction, vowel lengthening and consonant alternations

### Restricted and Unrestricted Tone



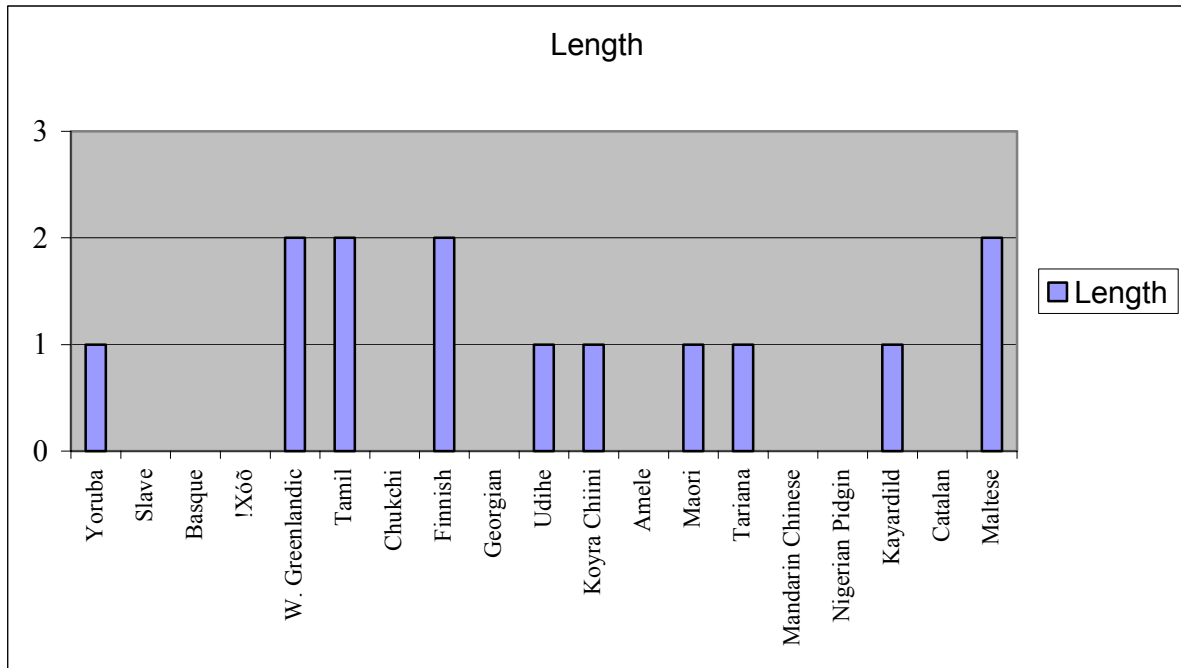
0 = no tone, 1 = restricted tone, 2 = unrestricted tone

### Syllable Complexity



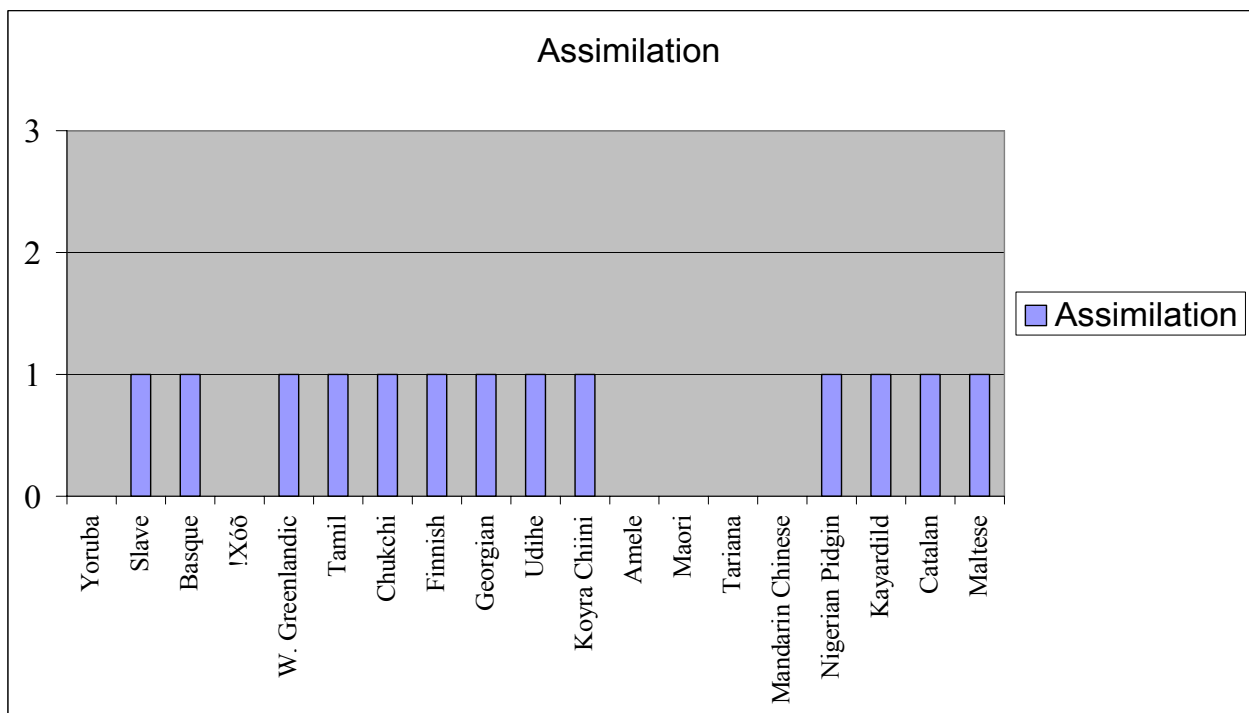
0 = 2-4 syllable types, 1 = 5-8 syllable types, 2 = 9-12 syllable types, 3 = > 13 syllable types

### Length Contrasts in Vowels and Consonants



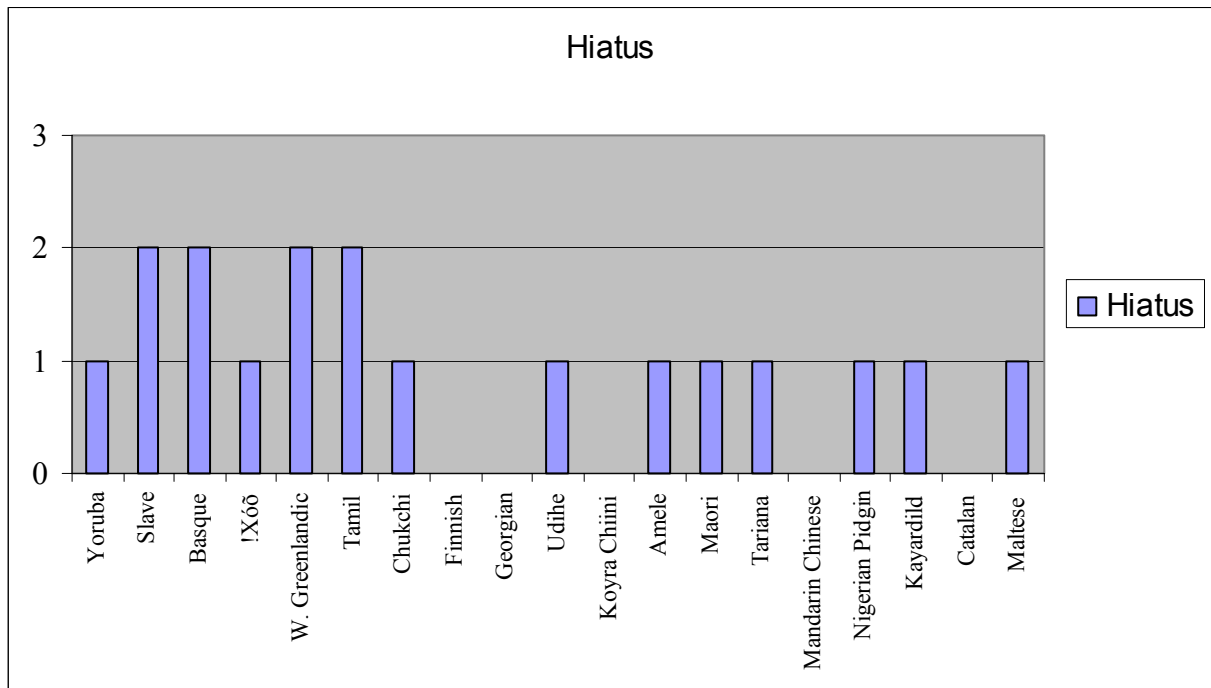
0 = no length contrasts, 1 = vowel length, 2 = vowel length & geminates

### Assimilations across Consonant Clusters



0 = no assimilation across consonant clusters, 1 = assimilation across consonant clusters

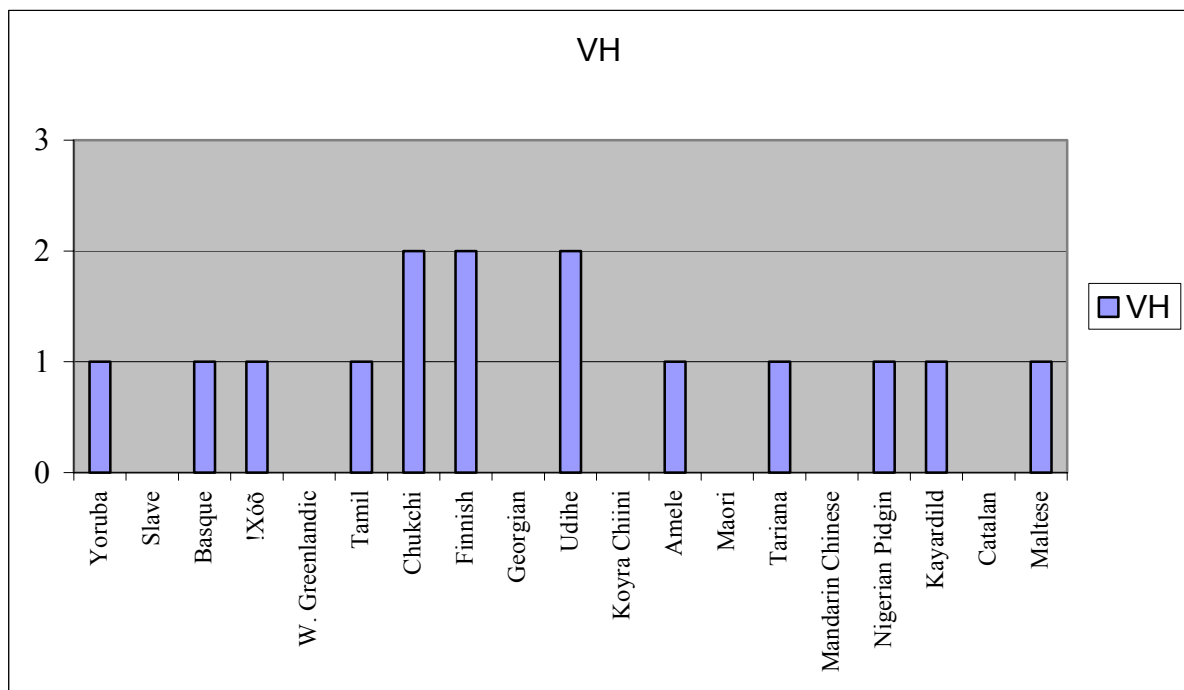
### Hiatus Resolution (Consonant Epenthesis & Vowel Deletion)



0 = no hiatus resolution, 1 = either vowel deletion or consonant epenthesis

2 = both vowel deletion and consonant epenthesis

### Vowel Harmony



0 = no VH, 1 = VH in disyllabic domains, 2 = word-spanning VH

**Prototypes of mora-based, syllable-based, and stress-based rhythm**

