Variability of Languages in Time and Space

Lecture 3
Phonology – Syllables - Suprasegmentals

• Syllable structure and patterns
• Syllable repair processes
• Suprasegmentals: stress, length, tones

Anja Nedoluzhko
A Syllable is:

- Well-recognized unit in linguistic analysis
  - Easy concept: If listeners differ in syllabifying a word, it is generally the case that both possible syllabifications are possible (pastry = past.ry or pas.try)
- Explains the number of rhythmic units
- This number is usually equal to the number of vowels (but *little*, *eagle*)
  - Exceptions?
Canonical Syllable Patterns

• Which syllable types are permitted in a language
  – Sequencing of segments within syllables (Consonant, Vowels)
• May be different in different positions (in onset vs. in cora)
  – Italian: allows more than one Consonant in the onset position
    pro.fon.do ‘deep’, tro.no ‘throne’, blat.ta ‘cockroach’
    but only a single Consonant in the coda position
    san.to ‘saint’, pal.ko ‘platform’, tor.ta ‘cake’
  – Khalkha Mongolian: allows only a single Consonant in the onset, but
    permits two Consonant in coda position
    ʃarx-tʃʰ ‘coroner’, taws-tʰ ‘salty’
Canonical Syllable Patterns

• CV – the most basic syllable, also within a language
• CV > CCV > CCCV and CV > V (markedness of the onset)
• CVC > CCV > CVCC > CVCCC
• CV > CVC > CCV

• CV is the most frequent syllable, also within a language where other possible combinations are possible
• Examples from 16 genetically diverse languages contained in the UCLA Lexical and Syllabic Inventory Database (ULSID)
Syllable Structures in Languages

CV  V  CVC  CCV  CVCC  ...  CCCVCCCC

Simple Syllable Structure  Moderately complex syllable structure  Complex syllable structure
Simple Syllable Structures

- CV
- V
- CVC
- CCV
- CVCC
- ...
- CCCVCCCCC

Syllable structures:

- Simple Syllable Structure
- Moderately complex syllable structure
- Complex syllable structure

Linguistic features:

- Congo: permitted not to have an initial consonant
- Papua New Guinea: Yareba

Languages mentioned:

- Congo
- Mba
- Fijian
- Yareba

wals.info
There are strict limits on what kinds of combinations are permitted: The second of two consonants is commonly limited to being one of a small set belonging to either “liquids” (r, l) or “glides” ([w] in en. wet).
Complex Syllable Structures

Simple Syllable Structure

Moderately complex syllable structure

Complex syllable structure

CV V CVC CCV CVCC ...

(C)(C)(C)V(C)(C)(C)(C)(C)

strengths /stɛŋkθs/

texts /tɛksts/

wals.info
Distribution in WALS

http://wals.info/feature/12A#2/16.6/153.1
Correlations Between Syllable Complexity and Other Properties

- Maddieson (2007), based on data from WALS: finds a positive correlation between complexity of syllable structure and the number of consonants such that languages permitting more complex syllable types tend to have a greater number of consonants.

<table>
<thead>
<tr>
<th>Consonants</th>
<th>Syllable structure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Simple</td>
<td>Moderate</td>
</tr>
<tr>
<td>Small</td>
<td>20</td>
<td>42</td>
</tr>
<tr>
<td>Mod. small</td>
<td>13</td>
<td>70</td>
</tr>
<tr>
<td>Average</td>
<td>16</td>
<td>90</td>
</tr>
<tr>
<td>Mod. large</td>
<td>3</td>
<td>56</td>
</tr>
<tr>
<td>Large</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>273</td>
</tr>
</tbody>
</table>

Gordon (2016)
Many languages have productive processes to ensure that their syllables adhere to language-internal constraints on syllable structure

- the insertion (epentheses) of vowels in order to eliminate closed syllables or consonant clusters

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**Cairene Arabic**

(a) /ʔul-t-l-u/  
/ʔultilu

/katab-t-l-u/  
katabtilu

‘I said to him’

‘I wrote to him’

**Iraqi Arabic**

(c) /gil-t-l-a/  
gilitla

/katab-t ma-ktu:b/  
katabit maktu:b

‘I said to him’

‘I wrote a letter’

*Gordon (2016)*
Many languages have productive processes to ensure that their syllables adhere to language-internal constraints on syllable structure:

- the insertion (epenthesis) of vowels in order to eliminate closed syllables or consonant clusters
- deletion of a segment

<table>
<thead>
<tr>
<th>Simple</th>
<th>Perfective</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>api</td>
<td>apit-ia</td>
<td>‘be lodged’</td>
</tr>
<tr>
<td>sopo</td>
<td>sopoʔ-ia</td>
<td>‘go across’</td>
</tr>
<tr>
<td>milo</td>
<td>milos-ia</td>
<td>‘twist’</td>
</tr>
<tr>
<td>oso</td>
<td>osof-ia</td>
<td>‘jump’</td>
</tr>
<tr>
<td>ȵalo</td>
<td>ȵalom-ia</td>
<td>‘forget’</td>
</tr>
</tbody>
</table>

Gordon (2016)
Syllable Structure: Slave

s-ôdee

dene-[h]ôdee

n-anaj

[h]anaj

b-ek’éhdí

bebí [h]ek’éhdí

ku-edehfe → kúdehfe

sah [h]edéhfe

‘my older brother’

‘Brother (in church)’

‘your (sg) sister-in-law (man speaking)’

‘sister-in-law’

‘I take care of him/her’

‘I take care of the baby’

‘I chased them’

‘s/he chased the bear’

1. What type of syllable is forbidden in Slave?

2. What and whz is inserted?

3. The syllable structure in Slave is
   
a) simple
   b) moderately complex
   c) complex
Syllable Structure: Fula

Continuous | Causative
---|---
hula | hulna
jara | jarna
woja | wojna
d³u:la | d³u:lna
wurto | wurtina
wudd³a | wudd³ina
jotto | jottina

‘laugh’
‘drink’
‘cry’
‘be Muslim’
‘come out’
‘steal’
‘arrive’

1. How does the marker for *Continuous* in Fula look like?
2. What is the marker of *Causative* in Fula?
3. The syllable structure in Fula is
   a) simple
   b) moderately complex
   c) complex
Suprasegmentals

• Vowels and consonants: segments of which speech is composed.
• Segments are composed together to form syllables
• Suprasegmentals are superimposed on the syllables. These are other features that are known as:
  – Stress
  – Length
  – Tones
Suprasegmentals: Stress

• Manifested by different acoustic properties
  – increased duration
  – higher fundamental frequency (the acoustic analog to the perceptual property of pitch)
  – increased intensity (greater loudness perceptually)
• Consonants and vowels in stressed syllables may undergo various fortition processes in stressed syllables ↔ Consonants and vowels in unstressed syllables may conversely display lenition effects
• The majority of languages possess some type of stress system
  – languages that are reported to lack stress are mostly tonal languages
  – out of the 176 languages in the 200-language WALS sample 141 (roughly 80%) use stress compared to 28 that have only tone or pitch accent
Databases on Stress Patterns

• StressTyp, **StressTyp2** (Goedemans et al. 2015) is a typological database containing information on stress and accent patterns in over 750 of the world's languages with nearly every language family represented

• **WALS** (World Atlas of Language Structures), info on 502 languages
  – [https://wals.info/](https://wals.info/)
Suprasegmentals: Stress

Stress is largely predictable based on phonological properties. Stress is used to contrast lexical items or different morphological forms in a paradigm.

- Fixed
  - Initial
  - Second
  - Third
  - Antepenultimate
  - Penultimate
  - Ultimate

- Bounded: the placement of stress is sensitive to properties of syllables.

- Unbounded (stress can be anywhere)

- Weight-Sensitive (variable) Stress
WALS: Fixed Stress Locations
## WALS: Fixed Stress Locations

<table>
<thead>
<tr>
<th>Value</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fixed stress (mostly weight-sensitive stress)</td>
<td>220</td>
</tr>
<tr>
<td>Initial: stress is on the first syllable</td>
<td>92</td>
</tr>
<tr>
<td>Second: stress is on the second syllable</td>
<td>16</td>
</tr>
<tr>
<td>Third: stress is on the third syllable</td>
<td>1</td>
</tr>
<tr>
<td>Antepenultimate: stress is on the antepenultimate (third from the right) syllable</td>
<td>12</td>
</tr>
<tr>
<td>Penultimate: stress is on the penultimate (second from the right) syllable</td>
<td>110</td>
</tr>
<tr>
<td>Ultimate: stress is on the ultimate (last) syllable</td>
<td>51</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>502</strong></td>
</tr>
</tbody>
</table>

### Mapudungun/Araucanian

- \( \ddot{t}i'panto \) \( \text{‘year’} \)
- \( e'lu\mu.yu \) \( \text{‘give us’} \)

### Winnebago, also known as Ho-Chunk language \(( Hooc\ddot{q}k, Hoc\ddot{q}k )\)

- Siouan language family

- \( hochi'chinik \) \( \text{‘boy’} \)
- \( waghi'ghi \) \( \text{‘ball’} \)
Suprasegmentals: Stress

Stress is largely predictable based on phonological properties.

Stress is used to contrast lexical items or different morphological forms in a paradigm.

Fixed
- Initial
- Second
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Bounded: the placement of stress is sensitive to properties of syllables.

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Weight-Sensitive (variable) Stress

Diagram:
- Stress is largely predictable based on phonological properties.
- Stress is used to contrast lexical items or different morphological forms in a paradigm.

Variables:
- Fixed
- Initial
- Second
- Third
- Antepenultimate
- Penultimate
- Ultimate

Bounded: the placement of stress is sensitive to properties of syllables.

Unbounded (stress can be anywhere)

Weight-Sensitive (variable) Stress
Weight-Sensitive Stress

https://wals.info/feature/15A#4/54.68/64.71
Weight-Sensitive Stress: Unbounded

**Russian**

дорога

(1) dorOga /dəɾOgə/  ‘a road’

(2) doroгA /dəɾoɡA/  ‘dear’

a) to contrast lexical items:

b) to contrast different morphological forms in a paradigm:

mOr’e  – ‘a sea’ (Nom.Sg.)

mor’A  – ‘seas’ (Nom. Pl)
Weight-Sensitive Stress: Bounded

tátul — fox
nətyálqin — hot
nuráqin — far
yályén — skin
néqeqin — quick
néséqqin — cold
tapláŋeqtən — he sews shoes
dósmyetək — roll up
ʔítek — be
paqótkuk — run
nilýeqinat — white
púnta — liver
qetúmyən — relative
píwtək — fall
nəmítqin — skillful
túmyətum — friend
tótkə — walrus
kóttu — forehead
qalpúqal — rainbow
kəpírik — hold in arms
təvítatətkən — I work
píntəvələŋək — throw at each other

Alyutor or Alutor is a language of Russia that belongs to the Chukotkan branch of the Chukotko-Kamchatkan languages

Formulate the stress rules and put the stress for the following words:
sawat - lasso
 pantawwi - boots
 naktɑqin - solid
 nənimən - bouillon
Suprasegmentals: Vowel Length

Within languages that make length distinctions, short segments tend to vastly outnumber their long counterparts.

Estonian

saada /saːta/ – ‘to get’
saada /sa·ta/ – ‘send!’
sada /sata/ – ‘hundred’

Arabic, Sanskrit, Japanese, Hebrew, Finnish, Hungarian, Italian, Czech etc.

Czech

šípk – ‘arrow’
šípk – ‘rosehip’ (Gen, SG)

The ratio of short-to-long vowels in 19 languages

Gordon 2016
Suprasegmentals: Tone

- The use of different pitch patterns to distinguish individual words or the grammatical forms of word
- Up to 60–70% of the world’s languages are tone languages (surprisingly sharp disagreements: different numbers in different classifications, cf. Maddieson’s (2013) in WALS)
- Tone languages are not distributed evenly throughout the world (widespread in Africa, Central America, and Southeast Asia)
WALS: Tones in languages
Suprasegmentals: Tone

No Tones

Simple tone systems

Complex tone systems

*English, Czech, German, Hebrew, Arabic, Finnish, French, ...*

*Stressed syllables containing a long vowel, diphthong, or a sonorant coda—may have one of two tones, falling (acute) tone or rising (circumflex) tone*

*Serbian*

+ length, + variable stress

short falling ⟨ı⟩, short rising ⟨i⟩; long falling ⟨î⟩; long rising ⟨í⟩

*ne znam* = /nēznām/ - ‘I don’t know’

*Lithuanian, Latvian*

*F* - falling (acute)  
*R* - rising (circumflex)  
*L* - level  
*B* - broken

/\kʰáá/ - ‘to trade’  
/ kʰ āā/ - ‘to get stuck’  
/ kàà/ - ‘galangal’  
/ káá/ - ‘leg’  
/ káà/ - ‘leg’

*Thai*

*Ideal* tone language: Every syllable in a word is differentiated solely on the basis of tone

*Reality:* most tone languages have constraints on the distribution of tones (e.g. limited to roots and certain affixal domains)
References

• Aleš Bičan. Kvantitativní analýza slabiky v českém lexikonu. 2015. Linguistica Brunensia. 63/2
• Thomas Stolz, Nicole Nau, Cornelia Stroh (Eds.) Monosyllables. From Phonology to Typology, Akademie Verlag, 2012.
• Charles Cairns and Eric Raimy (eds), 2011, Handbook of the Syllable.