

LINGUIST 168 Introduction to Linguistic Typology

LECTURE 7: PHONOLOGICAL TYPOLOGY
SEGMENTAL INVENTORIES

Ksenia Ershova

April 19, 2021

Plan for today

- Questions about previous lectures / homework / readings
- Phonological typology
 - › object of study
 - › segmental patterns
 - › syllable structure and rhythm
 - › tone, pitch, and prosody

Questions about reading

- Why is there so much disagreement about syllable structure in sign languages?
- How do linguists decide on sound equivalences (esp. vowels) across languages?
- Why are certain sounds or sound combinations more common?
 - › economy ~ ease of pronunciation
 - › processing ~ clarity of perceived contrasts
 - › Gordon, Matthew K. 2016. Phonological typology. OUP.
<https://searchworks.stanford.edu/view/11716369>

Questions about readings

- Is sociophonetics a thing?
 - › <https://linguistics.stanford.edu/research/sociolinguistics>
 - › Interactional Sociophonetics Lab
<https://stanford.edu/~podesva/lab.html>
- rhotacized vowels: English /ə̃/ in *flower*
- fricative vowels: vowel + obstruction, like a fricative consonant
- vowel contrast in length – to be discussed
- pitch accent and tone – to be discussed

Plan for today

- Questions about previous lectures / homework / readings
- Phonological typology
 - › object of study
 - › segmental patterns
 - › syllable structure and rhythm
 - › tone, pitch, and prosody

Typology of phonological systems

- Phonological typology identifies universals, trends and tendencies in the domain of sound and gesture (for sign languages):

1. Which sounds/gestures are possible?

Which are common? Universally present? Very rare?

2. Are there constraints on how sounds/gestures can combine?

3. How are sounds/gestures arranged into larger units (syllables or words)?

4. What additional phonological properties are relevant?


What are the rules governing these properties?

**segmental/
phonemic
inventories**

**phonotactics
and syllable
structure**

**suprasegmental:
pitch accent,
tone and prosody**

Phoneme

- smallest **contrastive** unit of speech
- may be pronounced in different ways depending on context
- versus **phone**  the specific pronunciation

word	phonology	phonetics
stake	/steɪk/	[steɪk]
take	/teɪk/	[t ^h eɪk]
bite	/baɪt/	[baɪt̚]
biter	/baɪtəɪ/	[baɪrə]

What counts as a phoneme?

- depends on researcher
- vowel diphthong [aɪ]

= one phoneme /aɪ/

= two phonemes /a/ + /ɪ/

- [s^wo]

= /s^w/ + /e/

= /s/ + /o/

- differences in pronunciation across languages:

Russian / t̚ /

English / t /



same or different?

Phonological typology

- object of study
- segmental patterns:
 - › consonants
 - › vowels
- syllable structure and rhythm
- tone, pitch, and prosody

Generalizations about phoneme inventories

- All languages have both consonants and vowels.
- A minimal inventory consists of 11 sound segments
 - › Rotokas: 6 consonants and 5 vowels

The largest known inventory consists of more than 100 sounds

- › !Xóõ
- IPA chart with audio:
https://www.internationalphoneticassociation.org/IPAcharts/inter_chart_2018/IPA_2018.html
- UCLA Phonological Segment Inventory Database (UPSID):
http://web.phonetik.uni-frankfurt.de/upsid_info.html

Most common consonants

	labial		dento-alveolar		palatal		velar		glottal
plosives	p	b	t	d	tʃ		k	g	ʔ
fricatives	f	β	s		ʃ				h
nasals		m		n		ɲ		ŋ	
approximant		w		l		j			
trill				r					
flap									

Rotokas: 6 consonants

Most common consonants

	labial		dento-alveolar		palatal		velar		glottal	
plosives	p	b	t	d	tʃ		k	g	ʔ	
fricatives	f		s		ʃ				h	
nasals		m		n		ɲ		ŋ		
approximant		w		l		j				
trill				r						

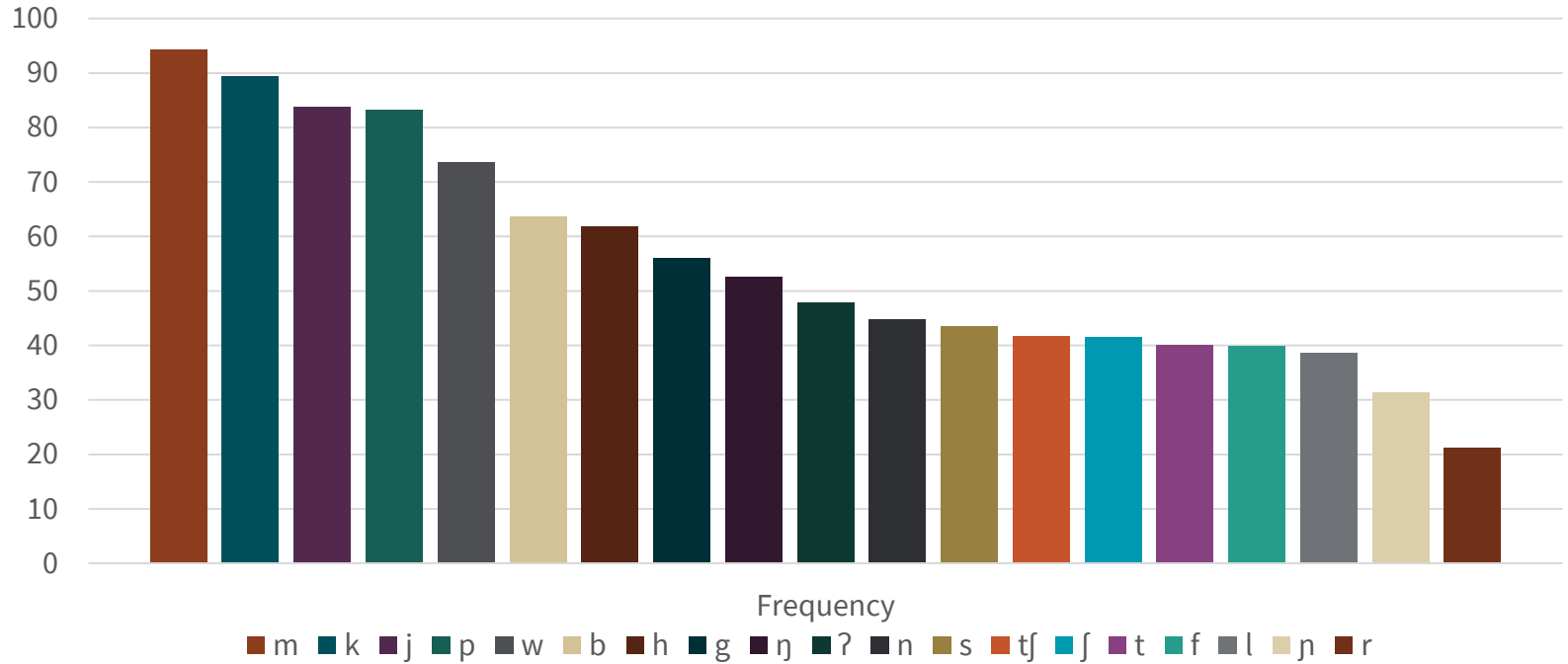
Pirahã: 8 consonants

Most common consonants

	labial		dento-alveolar		palatal		velar		glottal	
plosives	p	b	t	d	tʃ		k	g	ʔ	
fricatives	f	v	s		ʃ				h	
nasals		m		n		ɲ		ŋ		
approximant		w		l		j				
trill				r						

Samoan: 10 consonants

Most common consonants ranked



Common consonants are truly common!

Absence of common consonants

	Value	Representation
○	All present	503
●	No bilabials	4
●	No fricatives	48
●	No nasals	10
●	No bilabials or nasals	1
●	No fricatives or nasals	1
	Total:	567



<https://wals.info/chapter/18>

Stanford University

Very large consonant inventories: !Xóõ

<http://udel.edu/~dlarsen/ling203/Languages/!Xoo.pdf>

Very large consonant inventories: West Circassian plosives






		bilabial		dento-alveolar		palatal		velar		uvular		glottal	
	nasal	m		n									
stops	regular	b	p	d	t			k		q		ʔ	
	ejective		p'		t'			k'					
	labialized				t' ^w			g ^w	k ^w		q ^w		ʔ ^w
affricates	regular			dz	ts								
					tʃ	dʒ	tɕ						
	ejective				ts'		tɕ'						
					tʃ'								
	labialized			dz ^w	ts ^w								

Very large consonant inventories: West Circassian fricatives and approximants

		labial		dento-alveolar		post-alveolar		palatal		velar		uvular		pharyngeal
fricatives	regular		f	z	s	ʒ	ʃ	ç	ç	ɣ	x	ʀ	χ	ħ
	labialized										x ^w	ʀ ^w	χ ^w	
	laminal					ʒ̣	ʃ̣							
	lateral					ʒ̣	ʃ̣							
	approximant	w						j						
	trill			r										

Average consonant inventory

**English
German
French
Spanish
Mandarin
etc.**

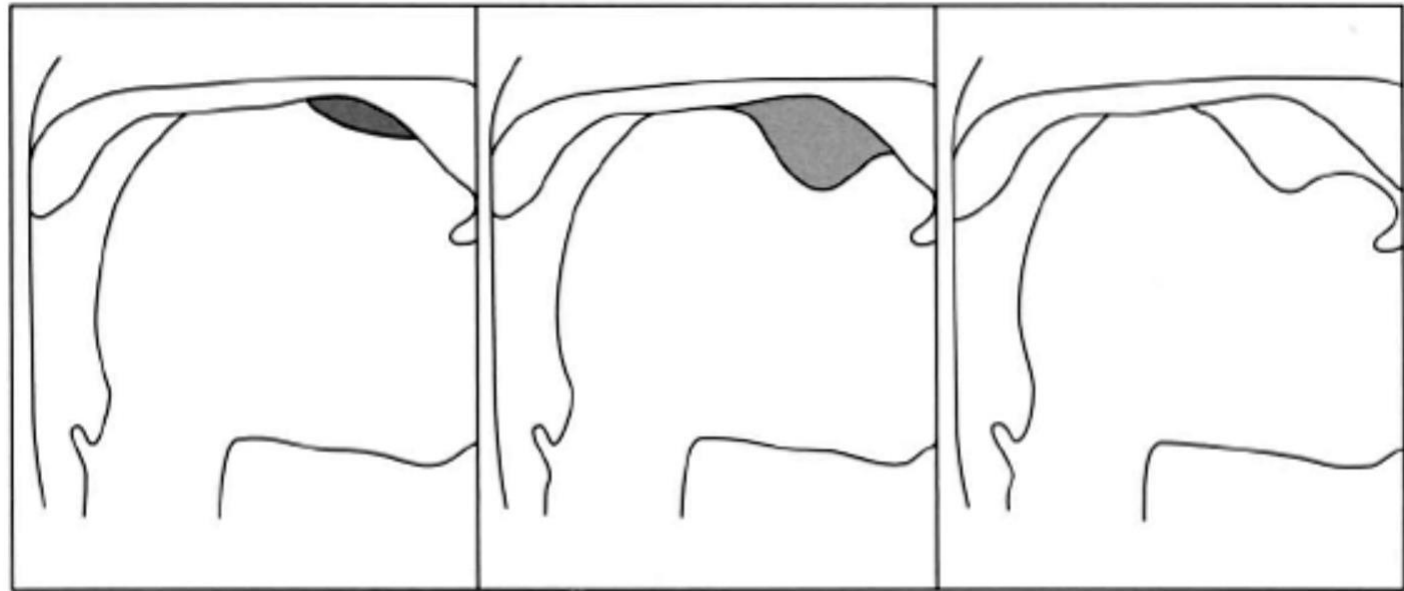
		Value	Representation
6-14		Small	89
15-18		Moderately small	122
19-25		Average	201
26-33		Moderately large	94
34+		Large	57
		Total:	563

Very rare consonants

- clicks → East Africa
- labial-velar plosives
 - › /g̠b̠ kp̠/ → two areas:
in West/Central Africa
in New Guinea
- pharyngeals
 - › /ħ ʕ/
- Dental/alveolar non-sibilant fricatives
 - › /θ ð/

clicks	
⊙	Bilabial fricated
	Laminal alveolar fricated (“dental”)
! ·	Apical (post)alveolar abrupt (“retroflex”)
‡	Laminal postalveolar abrupt (“palatal”)
	Lateral alveolar fricated (“lateral”)
⌘	Velar (back released)

Clicks



A. Two closures in mouth

B. Expansion of enclosed space

C. Release of front closure

Figure 1. Mechanism for making clicks

Distribution of the rarest consonants

	Value	Representation
○	None	449
◆	Clicks	9
●	Labial-velars	45
■	Pharyngeals	21
●	'Th' sounds	40
◆	Clicks, pharyngeals, and 'th'	1
■	Pharyngeals and 'th'	2
	Total:	567

Generalizations about plosives and fricatives

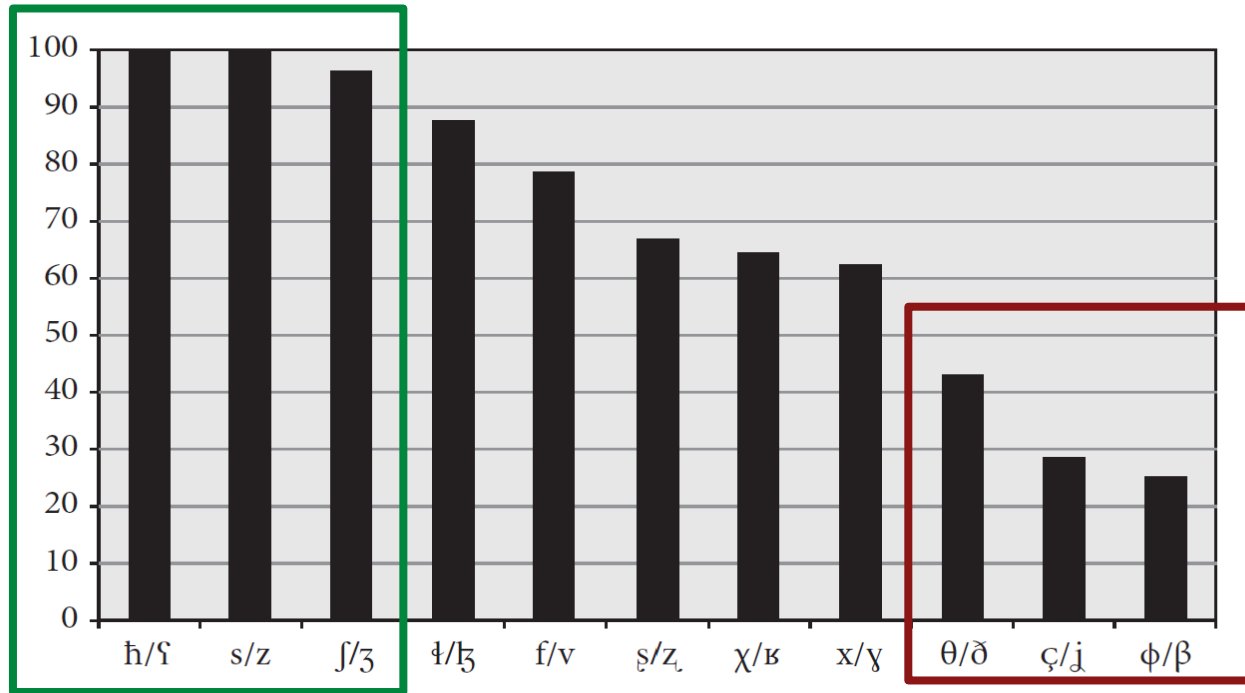
- All languages have plosives, but not all languages have fricatives.

/p t k/

/f θ x/

- Voiceless obstruents are more common than voiced ones:
 - › All languages have voiceless plosives.
 - › Most languages that have voiced fricatives, also have voiceless fricatives in the same place of articulation.

% of languages where the voiced member of the voiced/voiceless is missing



close to an absolute universal for /ʃ z ʒ/

/β ð ʣ/ might be approximants, not fricatives

Other generalizations about consonants

- Most languages have nasal consonants.
- Larger inventories may include consonants that are inherently more complex:
 - › clicks
 - › lateral fricatives
 - › glottalized consonants

Smaller inventories generally do not have these.

Survey:

<https://bit.ly/2P6gPwW>