

Variability of languages in time
and space

Linguistic Typology - Phonology

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phonemic inventories

- all families
 - The Stanford Project on Language Universals leading to the database “Stanford Phonology Archive” (SPA)
 - The **UCLA Phonological Segment Inventory Database** (or **UPSID**) is a statistical survey of the phoneme inventories in 451 of the world's languages - <http://web.phonetik.uni-frankfurt.de/upsid.html>
 - WALS - <http://wals.info/>
- selected families
 - Namkung (1998), Phonological Inventories of Tibeto-Burman Languages
 - Ramaswamy (1999), Common linguistic features in Indian languages: Phonetics
 - Phonemic Inventories Across Languages (<http://www.asha.org/practice/multicultural/Phono/>) – Arabic, English, Korean, Mandarin etc.

phonemes

- *pin, tin, kin, fin, thin, sin, shin*
- *dim, din, ding, did, dig, dish*
- *pin, pen, pan, pun, pain, pine, pawn*

phonemes

- *p*in, *t*in, *k*in, *f*in, *th*in, *s*in, *sh*in
- *d*im, *d*in, *d*ing, *d*id, *d*ig, *d*ish
- *p*in, *p*en, *p*an, *p*un, *p*ain, *p*ine, *p*awn

at the beginnings and ends of syllables vs. in the middle

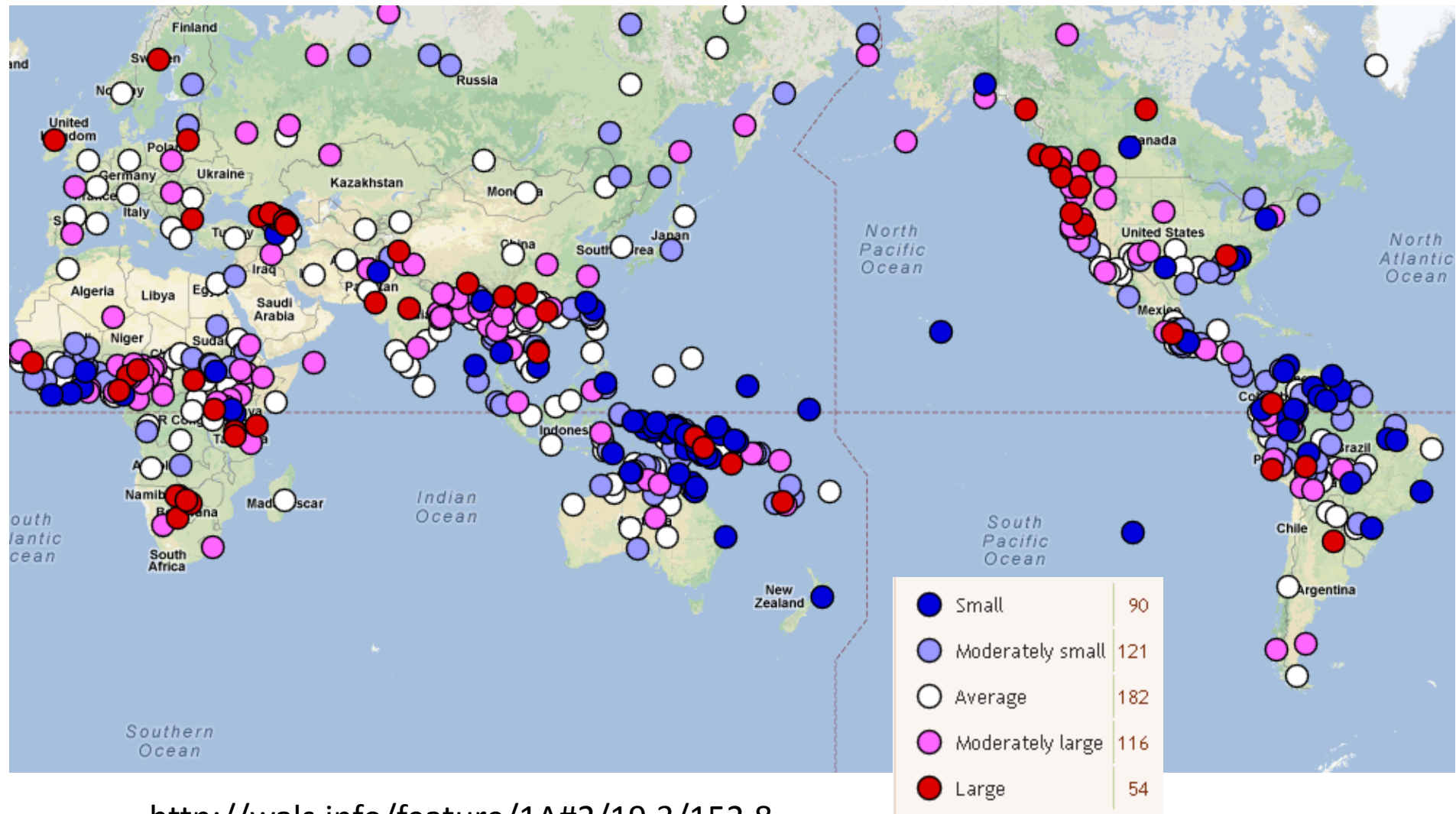


consonants and vowels

phonemes - consonants

- consonants (WALS)
 - small (6 to 14)
 - moderately small (15-18)
 - average (19-25)
 - moderately large (26-33),
 - large (34 or more consonants)

consonants



<http://wals.info/feature/1A#2/19.3/152.8>

Small	89
Moderately small	122
Average	201
Moderately large	94
Large	57

only 6 consonants
(/p, t, k, b, d, g/)

Střední rotokas	Bilabiální	Alveolární	Velární
Neznělá	p	t	k
Znělá	b ~ β	d ~ r	g ~ γ

LANGUAGE	FEEDBACK
A language of Papua New Guinea	
ISO 639-3	roo
Population	4,320 (Wurm and Hattori 1981).
Location	Bougainville Province, Central Bougainville district, central mountains. 28 villages.
Language Maps	Papua New Guinea, Map 13
Language Status	5 (Developing). Statutory language of provincial identity in Bougainville Autonomous Region (2007, Education Plan, Section 1.1.3), not yet implemented (2012).
Classification	North Bougainville, Rotokas
Dialects	Aita, Atsilima, Pipipala.
Typology	SOV.
Language Development	Literacy rate in L1: 50%–75%. Literacy rate in L2: 50%–75%. Dictionary. Grammar. NT: 1982.
Language Resources	OLAC resources in and about Rotokas
Writing	Latin script [Latn].

Rotokas

(West Bougainville;
Papua New Guinea)



References:

- *Firchow, Irwin and Jacqueline, and David Akoitai, compiler. 1973. Vocabulary of Rotokas-Pidgin-English. Ukarumpa, P. N. G.: Summer Institute of Linguistics*
- *Firchow, I. and Firchow, J. 1969. An abbreviated phoneme inventory. Anthropological Linguistics 11. 271-276*

Small	89
Moderately small	122
Average	201
Moderately large	94
Large	57

!Xóõ

(spoken in Botswana)



122 consonants

(mainly because it has a very large number of different click sounds with which a word may begin)

Click sounds? How to pronounce them?

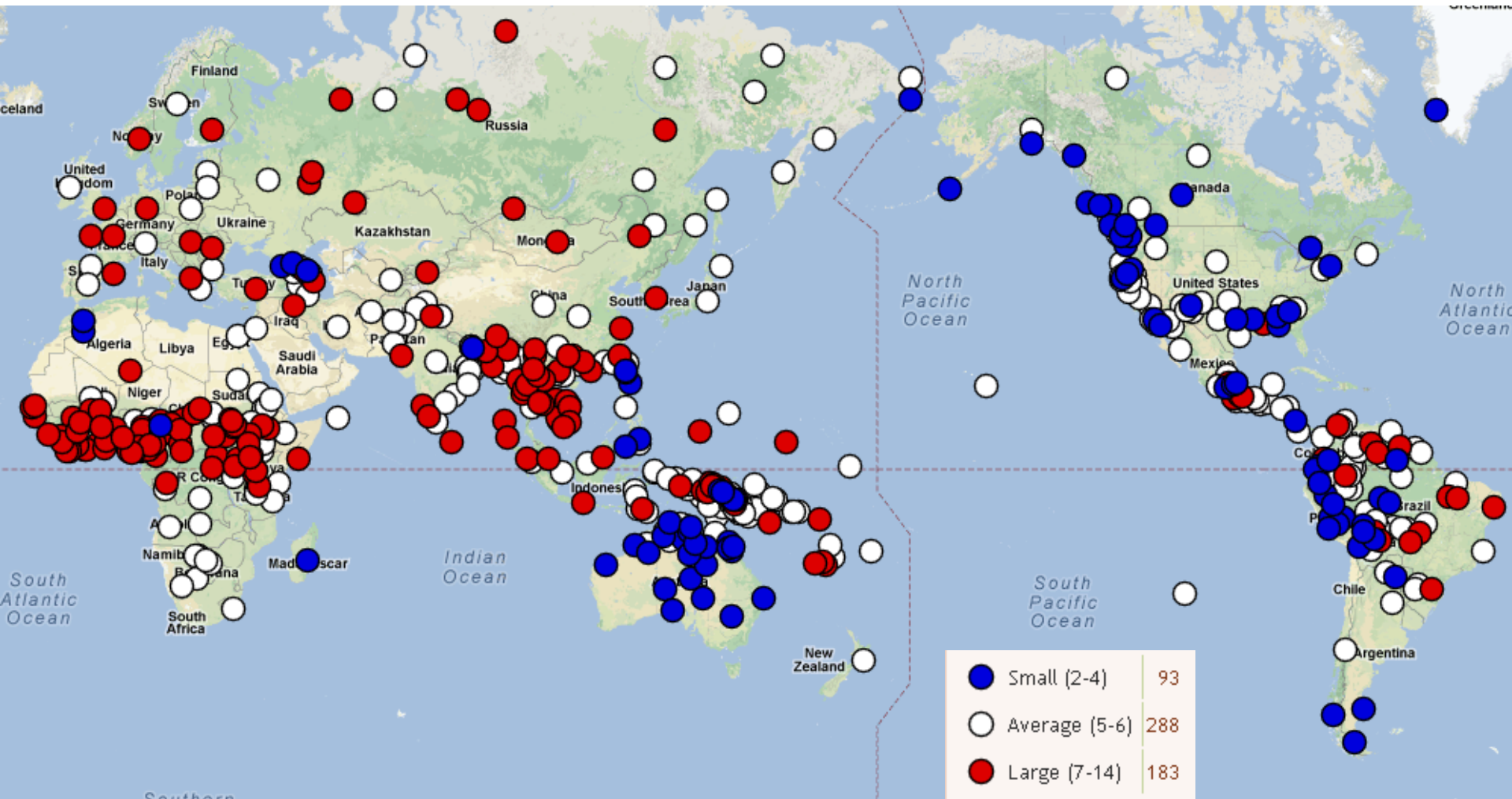
<https://www.youtube.com/watch?v=31zzMb3>

U0iY

phonemes - vowels

- vowels (according to WALS)
 - small (2 to 4)
 - average (5-6)
 - large (7-14)

vowel quality inventories



phonemes - vowels

- vowels (according to WALS)
 - small (2 to 4)
 - average (5-6)
 - large (7-14)
- *slightly* correlated to consonant inventories
- conventionality

ratio in WALS

Russian vowel inventories

ratio in WALS

		Labial				Dental		Alveolar		Palatal		Velar	
		Bilabial		Labiodental		Non Palatalized	Palatalized	Non Palatalized	Palatalized	Non Palatalized	Palatalized	Non Palatalized	Palatalized
		Non Palatalized	Palatalized	Non Palatalized	Palatalized								
Obstruents													
<i>Stop</i>	Unvoiced	p	pʲ			t	tʲ					k	kʲ*
	Voiced	b	bʲ			d	dʲ					g	gʲ*
<i>Affricates</i>	Unvoiced					ts			tʃʲ				
	Voiced												
<i>Fricatives</i>	Unvoiced			f	fʲ	s	sʲ	ʃ	ʃʲ*			x	xʲ*
	Voiced			v	vʲ	z	zʲ	ʒ					
Sonorants													
<i>Trills</i>	Voiced							r	rʲ				
<i>Nasals</i>	Voiced	m	mʲ			n	nʲ						
<i>Liquids</i>	Voiced					l	lʲ						
<i>Glide</i>	Voiced										j		

Подъем	Зона образования		
	Передняя	Непередняя	
Верхний	и	ы	у
Средний	ё (ъ)		
	е ь		о ь
Нижний	ä	а	
	Нелабиализованные		Лабиализованные

Подъем	Ряд		
	Передний	Средний	Задний
Верхний	ɨ ɯ	ɤ	ɤ*
Верхне-средний	ɘ*	ɘ*	
Средне-верхний	ø ɘ		
Средний	ɛ	ɤ	o
Нижний	ä	a	

phonemes - vowels

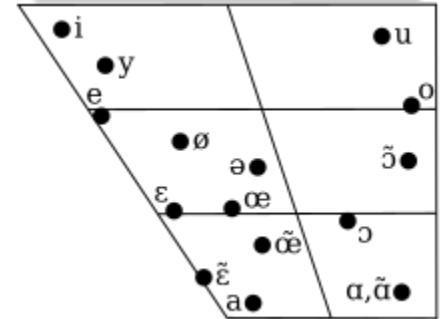
Small (2-4)	93
Average (5-6)	287
Large (7-14)	184



Yimas (Papua New Guinea): 2

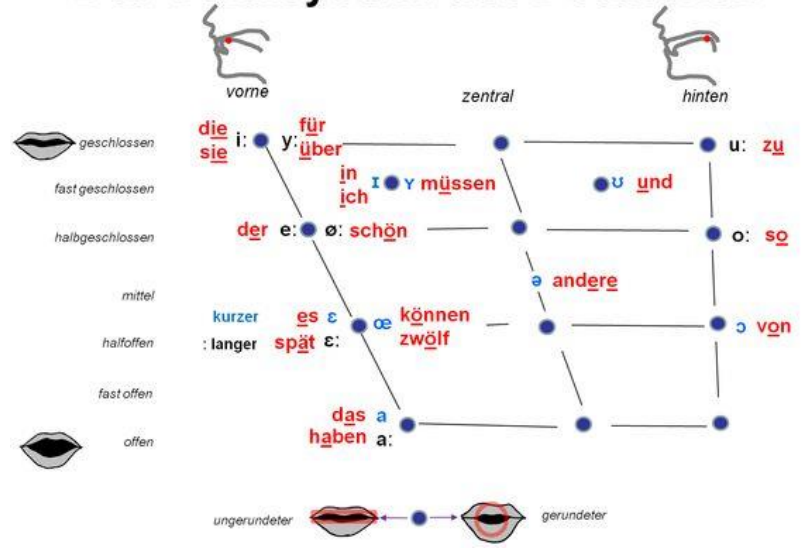


French: 16



German: 14

Das Vokalsystem des Deutschen



Vowel harmony

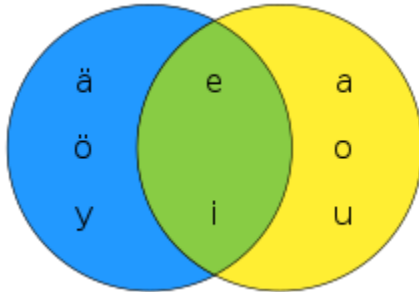
- a type of long-distance assimilatory phonological process involving vowels
- A vowel or vowels in a word are changed to sound the same (thus "in harmony.")
- In languages with vowel harmony, there are constraints on which vowels may be found near each other.

$V_a C V_b C V_b C \rightarrow V_a C V_a C V_a C$

- Many agglutinative languages have vowel harmony.

Vowel harmony

Finnish



Vowel backness (front or back)

'in' = ss $\frac{A}{\ddot{A}}$

talo ,house' – *talossa* ,in the house'
metsä ,forest' – *metsässä* ,in the forest'
venäläinen ,Russian' –
kuva ,picture' –
sieni ,mushroom' –
työpaikka ,workplace' -

Turkish

backness

plural affix = $\frac{LAR}{LER}$

aslan ,a lion' – *aslanlar* ,lions'
tilki ,a fox' – *tilkiler* ,foxes'

roundedness

a, ı → *i*
e, i → *i*
o, u → *u*
ö, ü → *ü*

akıllı ,clever' – *ben akıllıyı* ,I'm clever'
erkek ,man' – *sen erkeksin* ,you are a man'
tuzlu ,salty' – *deniz tuzludur* 'the sea is salty'
düşük 'low' - *derece düşüktür* 'low temperature'

1. Which words are compounds and why?

háború	'war'	körút	'ring way'
háborúról	'about war'	körről	'about ring'
bűn	'guilt'	bátor	'brave'
bűntelen	'guiltless'	bátorságról	'about braveness'
bűnről	'about guilt'	bátortalan	'not brave'
út	'way'	föld	'field'
útról	- 'about way'	földtelen	- 'fieldless'
keserű	- 'bitter'	burgonya	- 'potato'
keserűség	- 'bitterness'	burgonyaföld	- 'potato field'
keserűsó	- 'bitter salt'	sötét	- 'dark'
kör	- 'ring'	sötétség	- 'darkness'

2. Find the compounds

földtan, földnek, háborúellenes, Budapest, burgonyalevél, óraütés, hőálló, bűnöző.

3. Translate into Hungarian

guiltlessness, about field, about potato, wayless

Vowels - Suprasegmentals

stress

length

samo^hláska

tones

Stress in Languages

- A relative emphasis that is given to a certain syllable in a word
- Caused by increased vowel length, loudness, full articulation of the vowel

How does the stress look like in the following languages?

Czech

Croatian

Estonian

English

Finnish

French

Greek

German

Hungarian

Icelandic

Italian

Macedonian

Polish

Russian

Spanish

Slovene

Serbian

Welsh

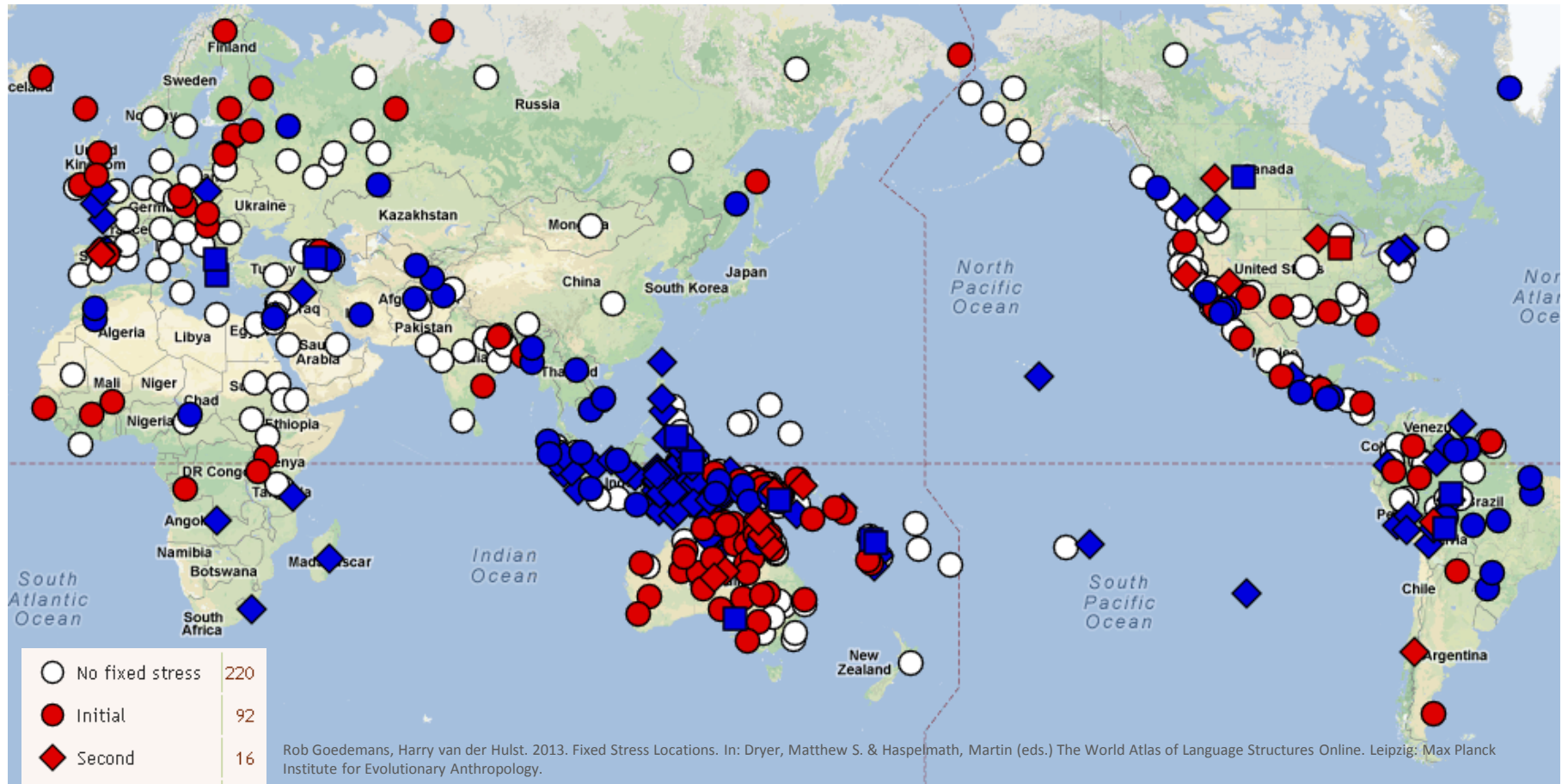
Fixed Stress

- The stress falls on a particular syllable of the word

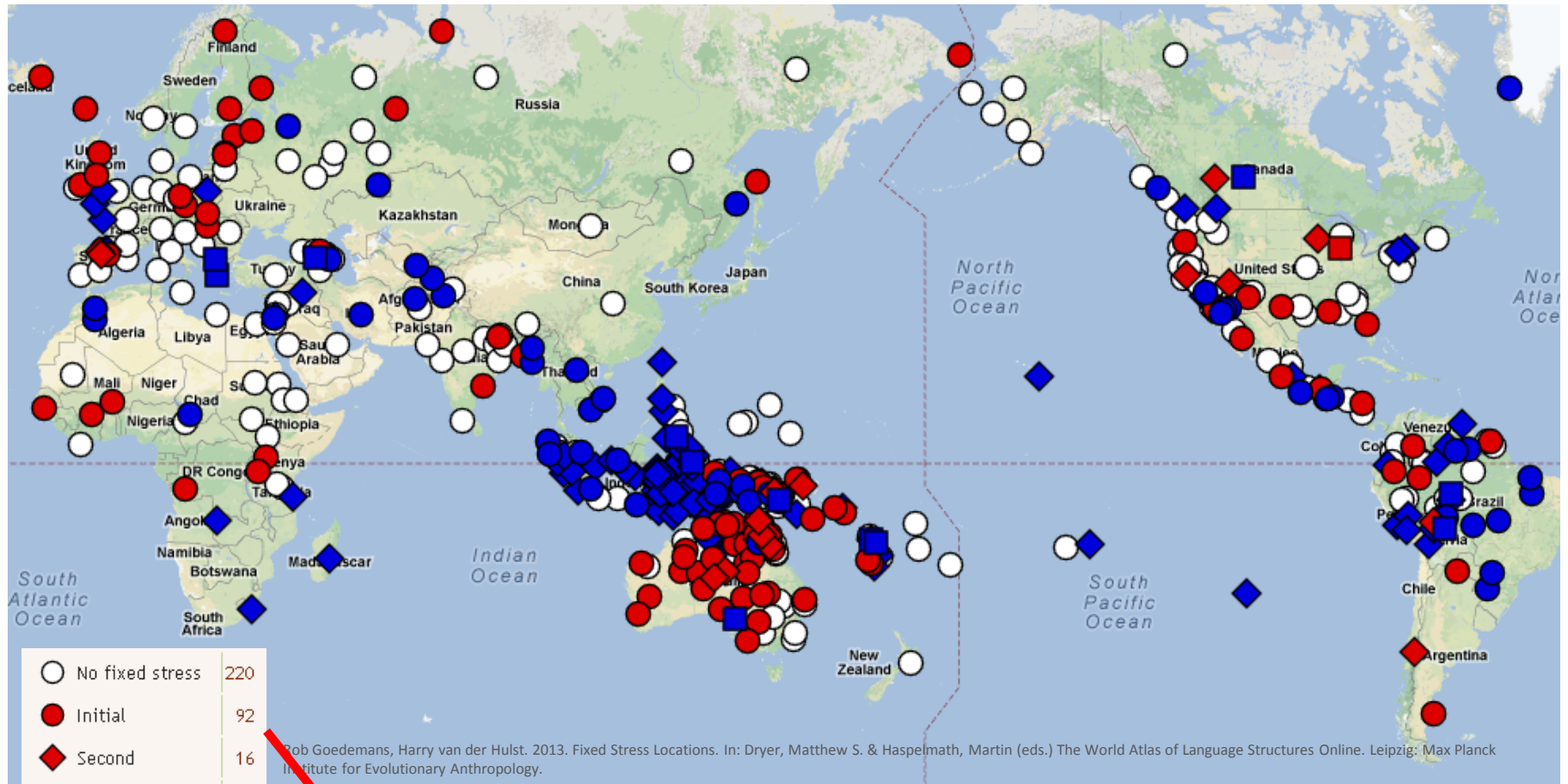


Czech

Fixed Stress Locations



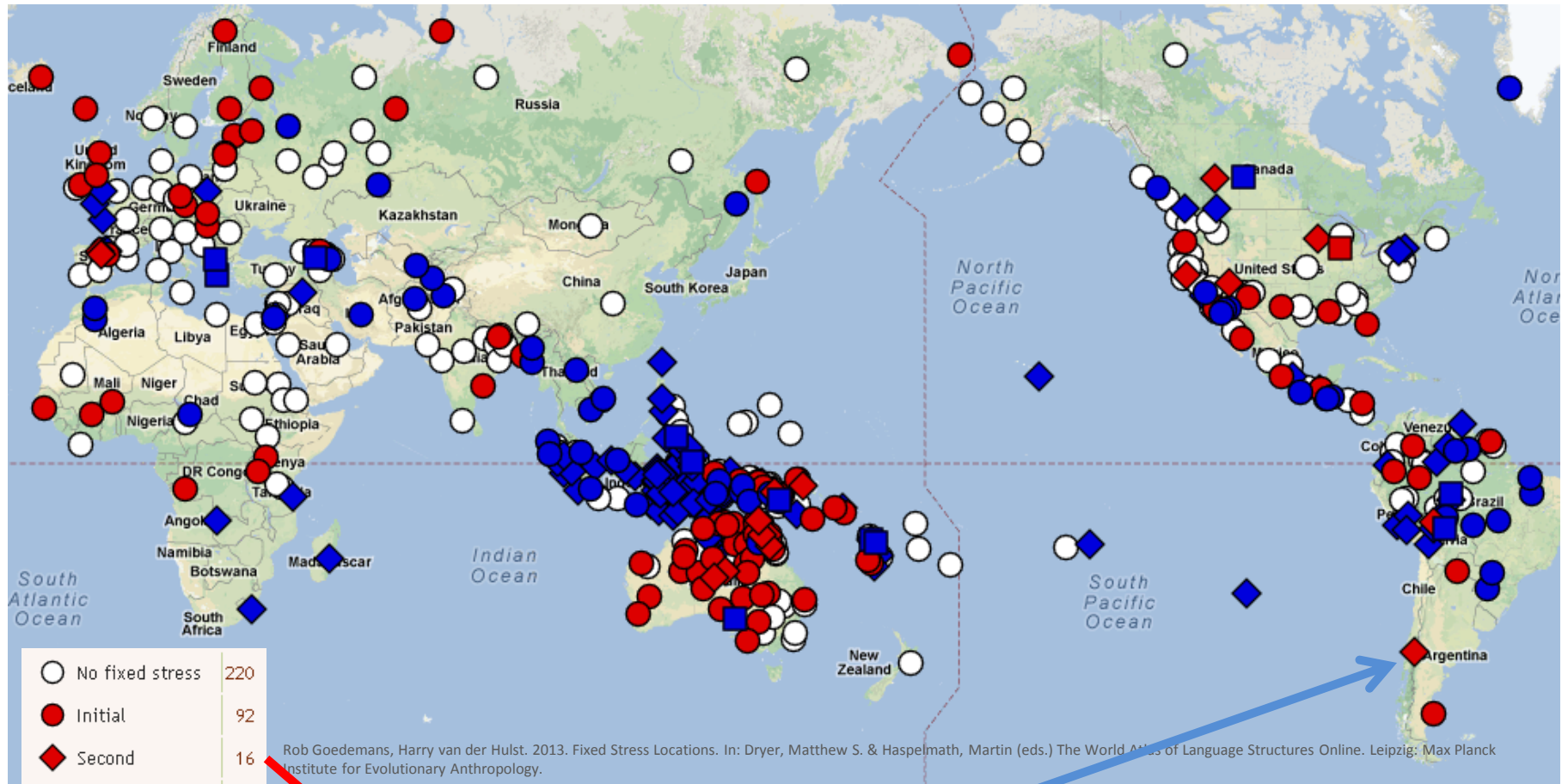
Fixed Stress Locations



→ Finnish, Estonian, Czech, Icelandic, Hungarian, ...

Czech: *krabička* 'box'

Fixed Stress Locations

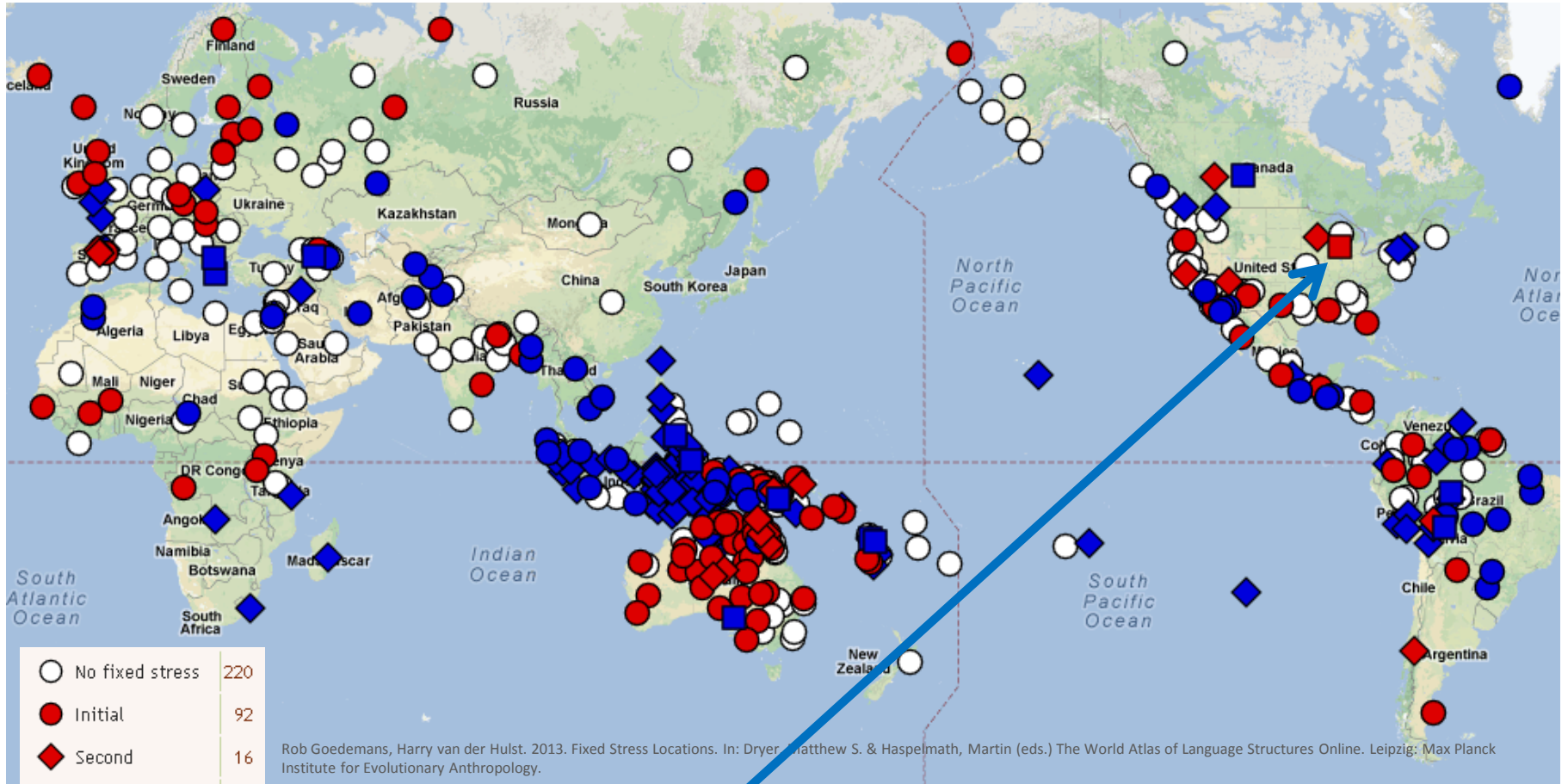


○ No fixed stress	220
● Initial	92
◆ Second	16
■ Third	1
■ Antepenultimate	12
◆ Penultimate	110
● Ultimate	51

Mapudungun/Araucanian, ...

ṭi'panto 'year', *e'lumu,yu* 'give us'.

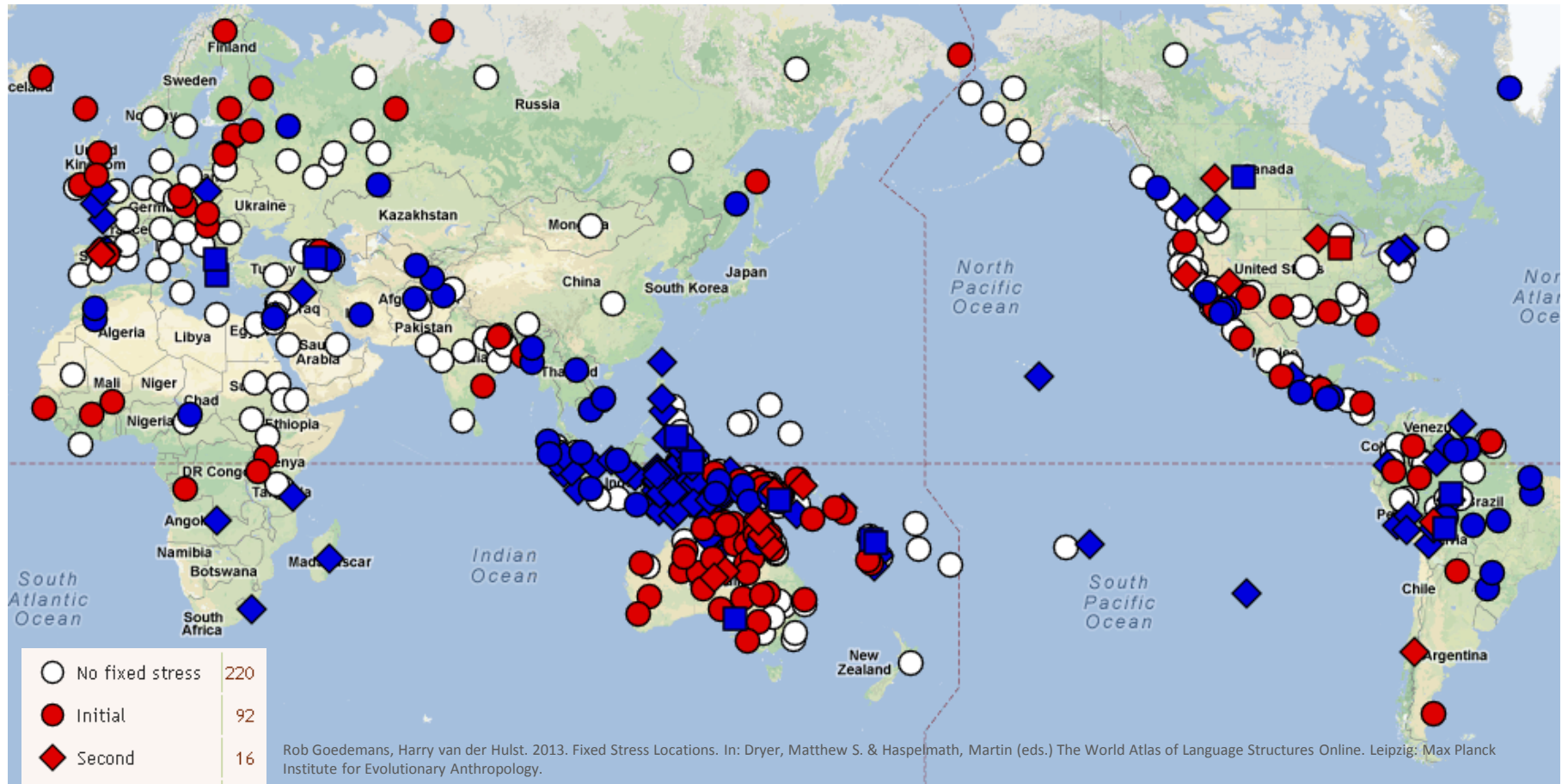
Fixed Stress Locations



Winnebago
Siouan language family

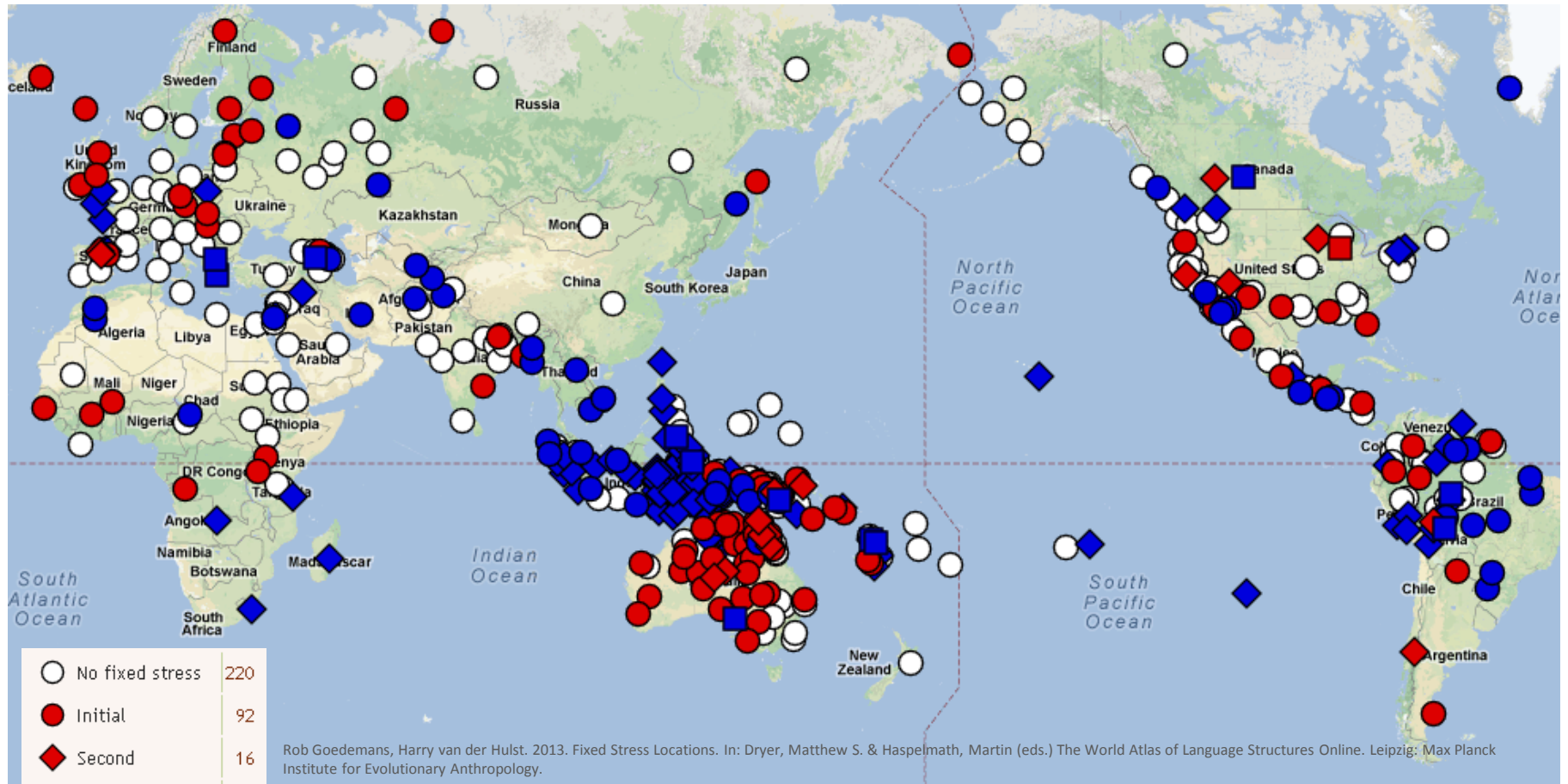
hochi'chirik 'boy', waghighi 'ball'

Fixed Stress Locations



→ Greek, Macedonian, ...

Fixed Stress Locations

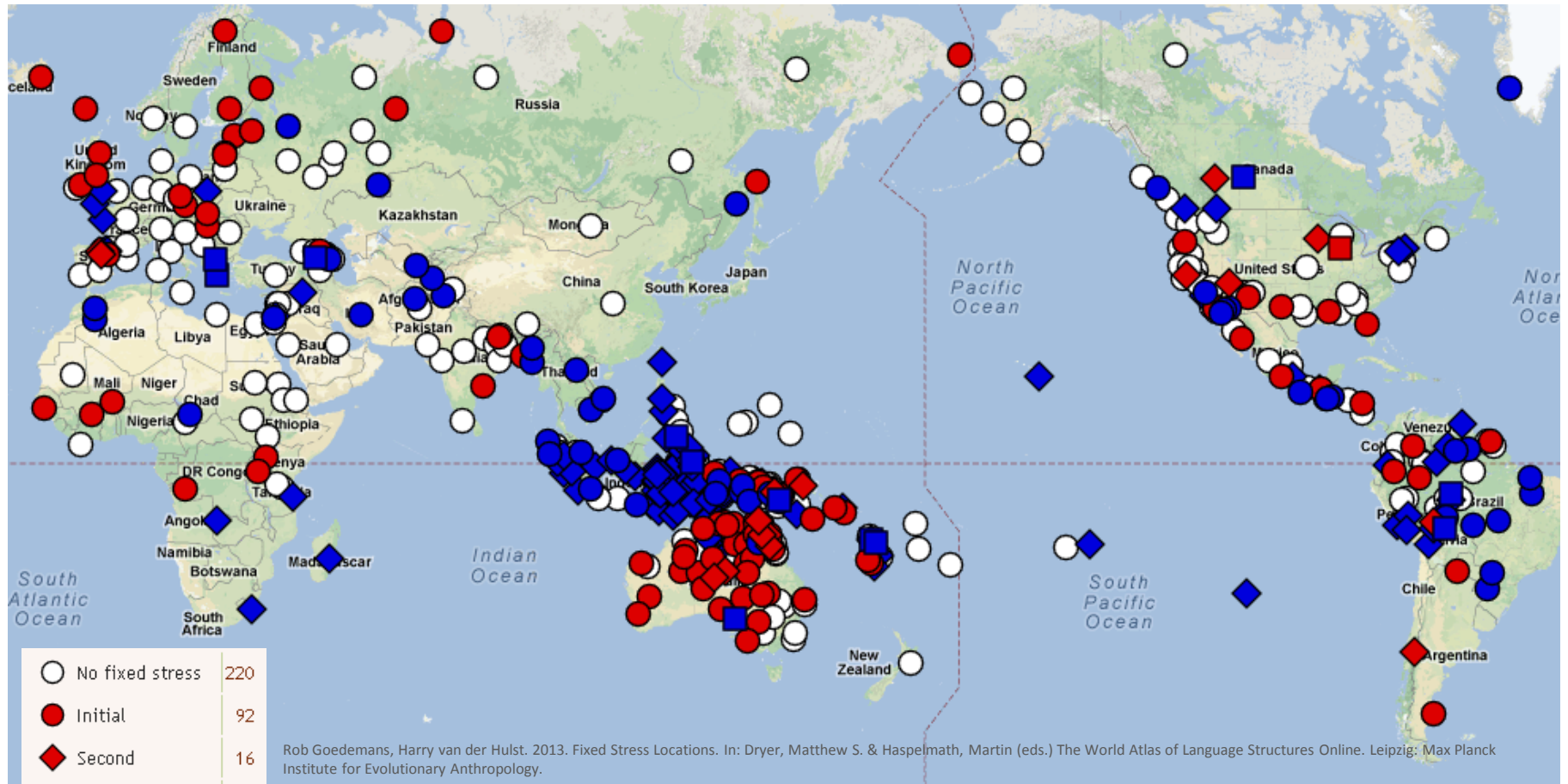


○ No fixed stress	220
● Initial	92
◆ Second	16
■ Third	1
■ Antepenultimate	12
◆ Penultimate	110
● Ultimate	51

→ Polish, Breton, Welsh, Basque, ...

Polish: *pudełko* 'box'

Fixed Stress Locations



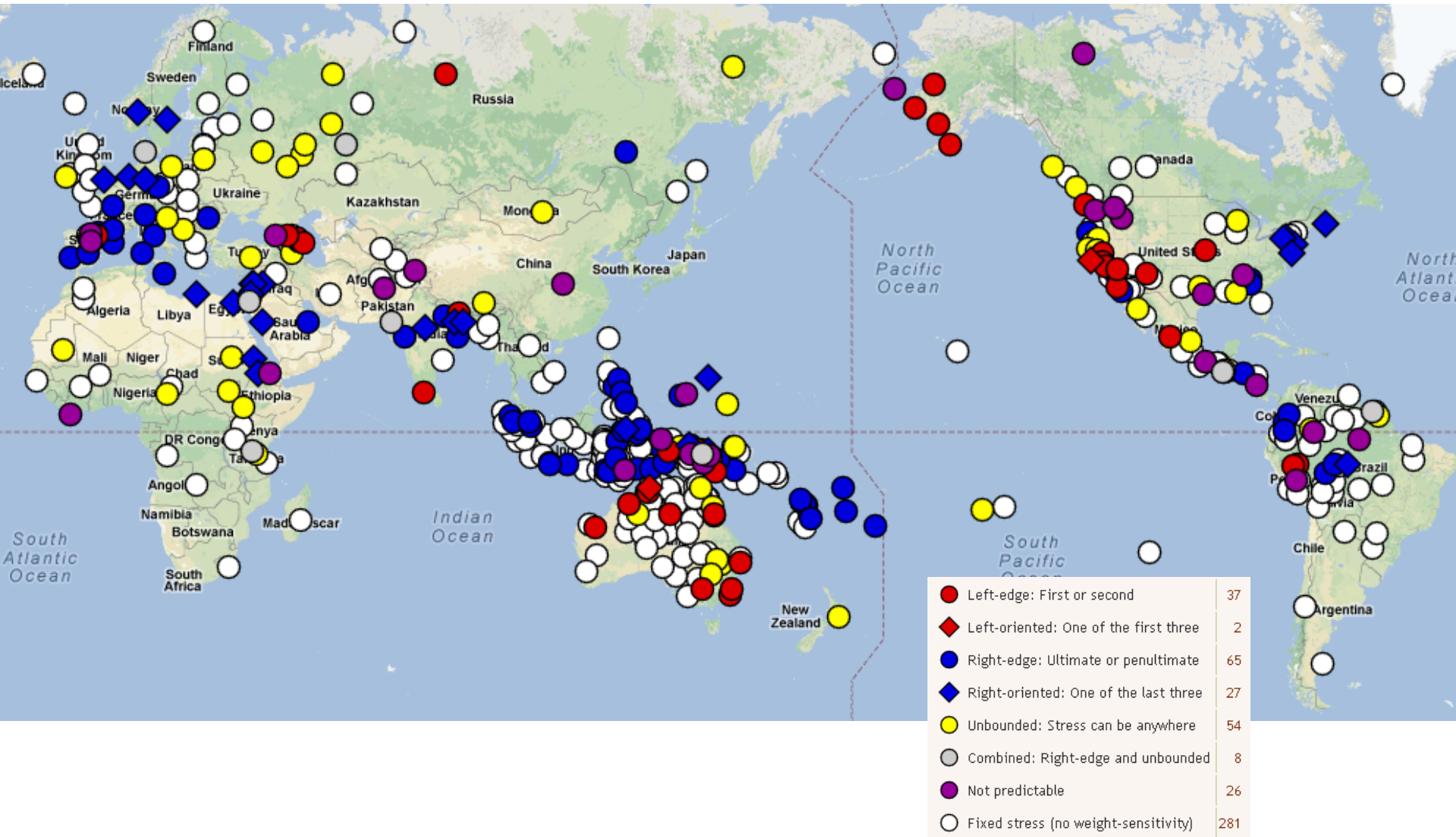
○ No fixed stress	220
● Initial	92
◆ Second	16
■ Third	1
■ Antepenultimate	12
◆ Penultimate	110
● Ultimate	51

→ Bashkir, Uzber, Tajik, Berber

Vowels - stress

- fixed
 - Initial: stress is on the first syllable
 - Second: stress is on the second syllable
 - Third: stress is on the third syllable
 - Antepenultimate: stress is on the antepenultimate (third from the right) syllable
 - Penultimate: stress is on the penultimate (second from the right) syllable
 - Ultimate: stress is on the ultimate (first from the right) syllable
- variable
 - bounded (the placement of stress is sensitive, for example, to properties of syllables)
 - unbounded (stress can be anywhere)

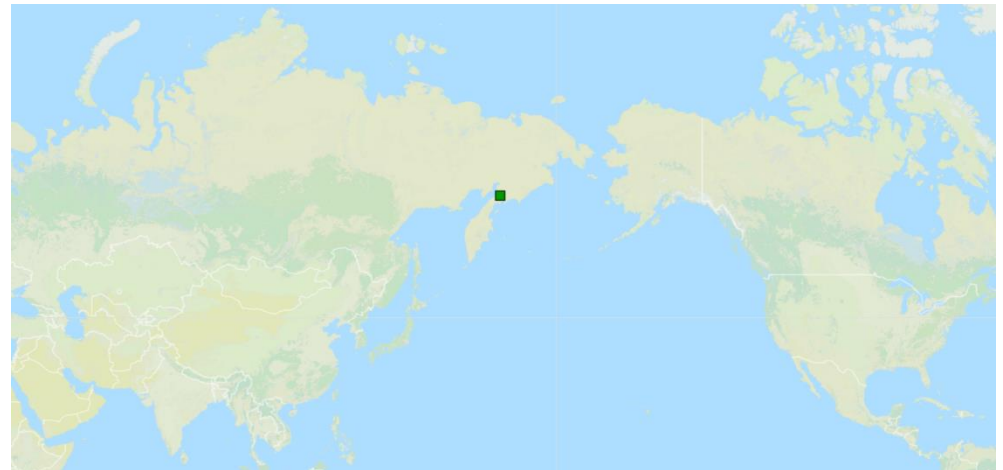
Weight-Sensitive Stress



tátul	—	fox
nətyəlqin	—	hot
nuráqin	—	far
yəlyən	—	skin
néqəqin	—	quick
nəsəqqin	—	cold
taplájətkən	—	he sews shoes
kəmyətək	—	roll up
ʔítək	—	be
paqətkuk	—	run
nilyəqinat	—	white
púnta	—	liver
qetúmyən	—	relative
píwtak	—	fall
nəmítqin	—	skillful
túmyətum	—	friend
tátka	—	walrus
kəttil	—	forehead
qalpúqal	—	rainbow
kəpírik	—	hold in arms
təvítatətkən	—	I work
píntəvəljək	—	throw at each other

Formulate the stress rules for Alyutor and put the stress for the following words.

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



sawat - lasso
pantawwi - boots
nəktəqin - solid
nəminəm - bouillon

Vowels – Unbounded Stress

Variable stress in Russian

Russian

дорога

Variable stress in Russian

Russian

дорога

dorOga
'a road'



Variable stress in Russian

Russian

дорога

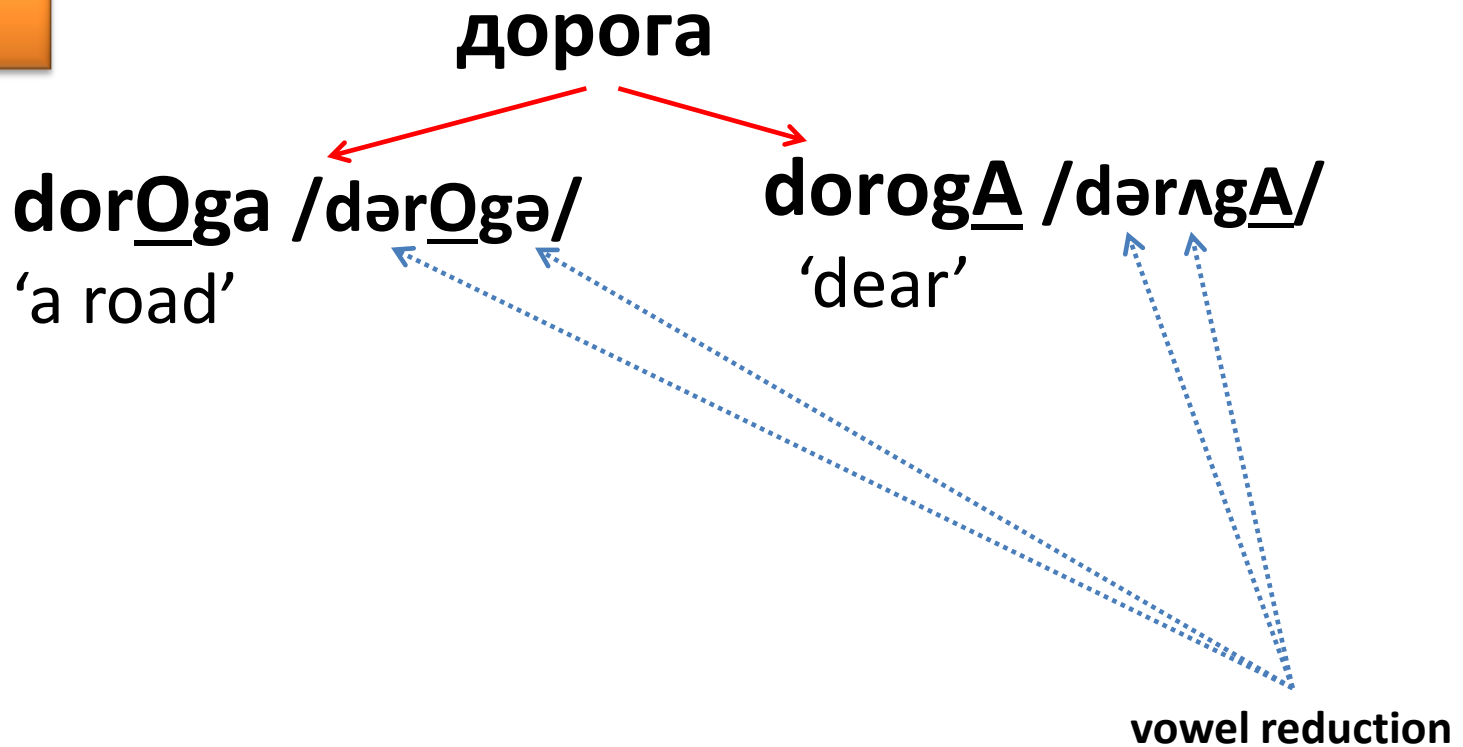
dorOga
'a road'

dorogA
'dear'



Variable stress in Russian

Russian



Variable stress in Russian

Russian

mOr'e – 'a sea' (Nom.Sg.)

mor'A – 'seas' (Nom. Pl)

		а	б	с	д	е	ф
Единственное число	И	■ о к <u>ар</u> та	□ ● ст <u>ол</u>	■ о м <u>ор</u> е	□ ● в <u>ин</u> а	■ о в <u>ол</u> к	□ ● г <u>уб</u> а
	Р	■ о к <u>арт</u> ы	□ ● ст <u>ол</u> а	■ о м <u>ор</u> я	□ ● в <u>ин</u> а	■ о в <u>ол</u> к <u>а</u>	□ ● г <u>уб</u> ы
	Д	■ о к <u>арт</u> е	□ ● ст <u>ол</u> у	■ о м <u>ор</u> ю	□ ● в <u>ин</u> у	■ о в <u>ол</u> к <u>у</u>	□ ● г <u>уб</u> е
	В	■ о к <u>арт</u> у	□ ● ст <u>ол</u>	■ о м <u>ор</u> е	□ ● в <u>ин</u> а	■ о в <u>ол</u> к <u>а</u>	□ ● г <u>уб</u> у
	Т	■ о к <u>арт</u> ой	□ ● ст <u>ол</u> ом	■ о м <u>ор</u> ем	□ ● в <u>ин</u> ом	■ о в <u>ол</u> к <u>ом</u>	□ ● г <u>уб</u> ой
	П	■ о о к <u>арт</u> е	□ ● о ст <u>ол</u> е	■ о о м <u>ор</u> е	□ ● о в <u>ин</u> е	■ о о в <u>ол</u> к <u>е</u>	□ ● о г <u>уб</u> е
Множественное число	И	■ о к <u>арт</u> ы	□ ● ст <u>ол</u> ы	□ ● м <u>ор</u> я	■ о в <u>ц</u> на	■ о в <u>ол</u> к <u>и</u>	■ о г <u>уб</u> ы
	Р	■ о к <u>арт</u>	□ ● ст <u>ол</u> ов	□ ● м <u>ор</u> ей	■ о в <u>ц</u> н	□ ● в <u>ол</u> к <u>ов</u>	□ ● г <u>уб</u>
	Д	■ о к <u>арт</u> ам	□ ● ст <u>ол</u> ам	□ ● м <u>ор</u> ям	■ о в <u>ц</u> нам	□ ● в <u>ол</u> к <u>ам</u>	□ ● г <u>уб</u> ам
	Т	■ о к <u>арт</u> ами	□ ● ст <u>ол</u> ами	□ ● м <u>ор</u> ями	■ о в <u>ц</u> нами	□ ● в <u>ол</u> к <u>ами</u>	□ ● г <u>уб</u> ами
	П	■ о о к <u>арт</u> ах	□ ● о ст <u>ол</u> ах	□ ● о м <u>ор</u> ях	■ о о в <u>ц</u> нах	□ ● о в <u>ол</u> к <u>ах</u>	□ ● о г <u>уб</u> ах

Vowels - Suprasegmentals

stress

length

samohláska

tones

Vowels – length

Estonian

saada /sa:ta/ – ‘to get’
saada /sa.ta/ – ‘send!’
sada /sata/ – ‘hundred’

vowel length

Czech

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

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

What about vowel length in English, German, Russian, etc.?

Vowels - Suprasegmentals

stress

length

samohláska

tones

Vowels – tones

Thai

/k^háá/ - ‘to trade’

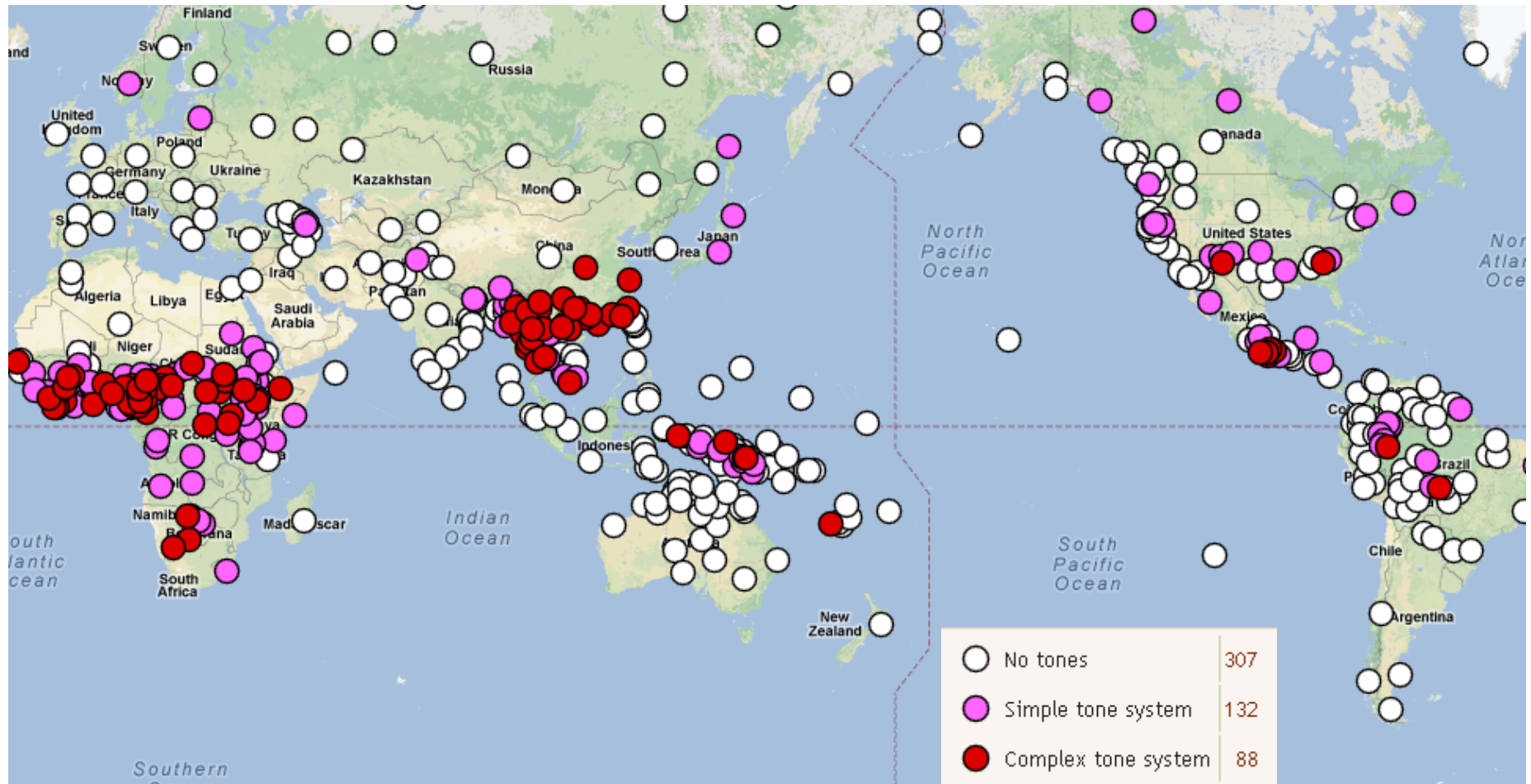
/ k^h āā/ - ‘to get stuck’

/ k^h àà/ - ‘galangal’

/ k^h àá/ - ‘leg’

/ k^h áà/ - *politeness particle*

Tones in languages



<https://wals.info/feature/13A#2/19.3/152.9>

Vowels – tones

Thai

/k^háá/ - 'to trade'

/k^hāā/ - 'to get stuck'

/k^hàà/ - 'galangal'

/k^hàá/ - 'leg'

/k^háà/ - *politeness particle*

Japanese

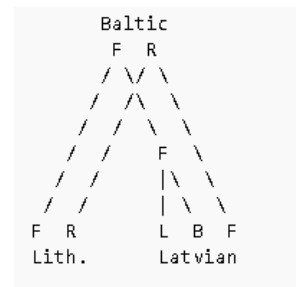
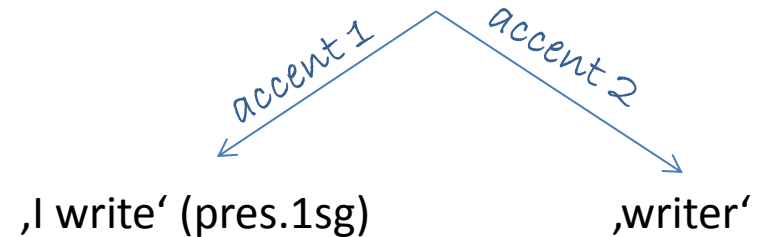
箸 — hashi (хаси; палочки для еды) и 橋 hashi (хаси; мост)

雨 — ame (амэ; дождь) и 飴 ame (амэ; конфета, ириска)

神 — kami (ками; Бог) и 紙 kami (ками; бумага)

Norwegian

skriver



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

Lithuanian, Latvian

"acute" or "circumflex"

Vowels – tones

Old Slavic

*acute (rising)

*circumflex

*“new acut”

**i-e. *dorgh.* → o.sl. **dǫrg-*

rus, ukr.

дорóга

(vs. *дорозá*)

srb.

дрàга

cs.

dráha

(vs. *drahá*)

Vowels – tones

Old Slavic
*acute (rising)
*circumflex
*“new acut”

**i-e. *dorgh.* → o.sl. **dǫrg-*

rus, ukr.
до́ро́га
(vs. до̀ро̀га́)

srb.
d̂pà̀ga

cs.
dráha
(vs. drahá)

Neoštokavian idiom used for the basis of
standard **Bosnian, Croatian and Serbian**

Pitch accent:

short falling ⟨î̂⟩,
short rising ⟨î̇⟩;
long falling ⟨î̂̄⟩
long rising ⟨î̇̄⟩

+ length,
+variable stress

ne znam = /nèznām/ - ‘I don’t know’;.

Serbian – Russian accents and tones

Serbian	Russian
говòрити	говор и ть [govor i ti] ‘speak’
мухòловка	мухол о вка [muchol o vka] ‘flytrap’
мѐд	мѐд [mjed] ‘honey’
брòд	брод [brod] ‘ford’
брòда	бр о да [bor o da] ‘ford’, GSg
брáда	бор о да [bor o da] ‘beard’
брáв	бр о ров [bor o rov] ‘hog’
красòта	крас о та [kras o ta] ‘beauty’
блáто	бол о то [bol o to] ‘bog’
злáто	зол о то [zol o to] ‘gold’

Serbian	Russian
беспòвратно	бесповор о тно [bespovor o tno] ‘irreversibly’
мрáз	мор о з [mor o z] ‘frost’
крòтки	кр о ткий [kr o tkij] ‘gentle’
седòбради	седобор о дый [sedobor o dyj] ‘grey-bearded’
бѐзумни	без у мный [bez u mnyj] ‘mad’
вùчица	волч и ца [volč i ca] ‘she-wolf’
бùха	бл о ха [bloch a] ‘flea’
тùсти	тол с тый [tol s tyj] ‘fat’
влáкно	воло к но [volok n o] ‘fibre’
слáби	сла б ый [slab y j] ‘weak’

1. Translate from Russian into Serbian:

город [gor**o**d] ‘town’ _____

голова [golov**a**] ‘head’ _____

ко**л**ода [kol**o**da] ‘block’ _____

безгол**о**вый [bezgol**o**vyj] ‘headless’ _____

глот**а**ть [glot**a**t’] ‘swallow’ _____

сестр**а** [sestr**a**] ‘sister’ _____

голор**у**кий [golor**u**kij] ‘barehanded’ _____

золотор**о**гий [zolotor**o**gij] ‘gold-horned’ _____

волк [volk] ‘he-wolf’ _____

грех [grech] ‘sin’ _____

вер**а** [ver**a**] ‘belief’ _____

2. Translate from Serbian into Russian:

врàна вèдро зàмка òбрезати
 нèбо вèдро нòски