Comparison beyond codable traits: Tone and its contribution to typology

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UNIVERSITÄT BERN

On comparison

Linguistic Typology

classification into broad, language-level types	multivariate/ distributional typology	family-level comparison & microtypology	?
word order correlations, …	WALS / GRAMBANK / PHOIBLE		
kinship, residence, …	HRAF / D-PLACE		
classification into community-level types	structuralism, typological correlations	controlled comparison (microethnology)	historicization

Sociocultural Anthropology

Bickel 2007. *Ling Typology* | Heath 2016. *Ling Typology* | Woodbury 2024. *Language*

On comparison

Linguistic Typology

classification into broad, language-level types	multivariate/ distributional typology	family-level comparison & microtypology	comparison of evolutionary processes

word order correlations, …

WALS / GRAMBANK / PHOIBLE

kinship, residence, …

HRAF / D-PLACE

Sociocultural Anthropology

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Bickel 2007. *Ling Typology* | Heath 2016. *Ling Typology* | Woodbury 2024. *Language*

Roadmap

Tone in typology so far: comparability issues

Three examples of what tone can do:

Chácobo, San Martín Duraznos Mixtec, Gyeli

Rethinking typology from the perspective of tone

Conclusions and outlook

Where is tone in typology?

half or more of the world's languages make use of pitch to distinguish morphemes
(cf. Yip 2002)

but tone is not well represented in typology

phonology is underrepresented in typology even though it was the starting point
(cf. Moran et al. 2023)

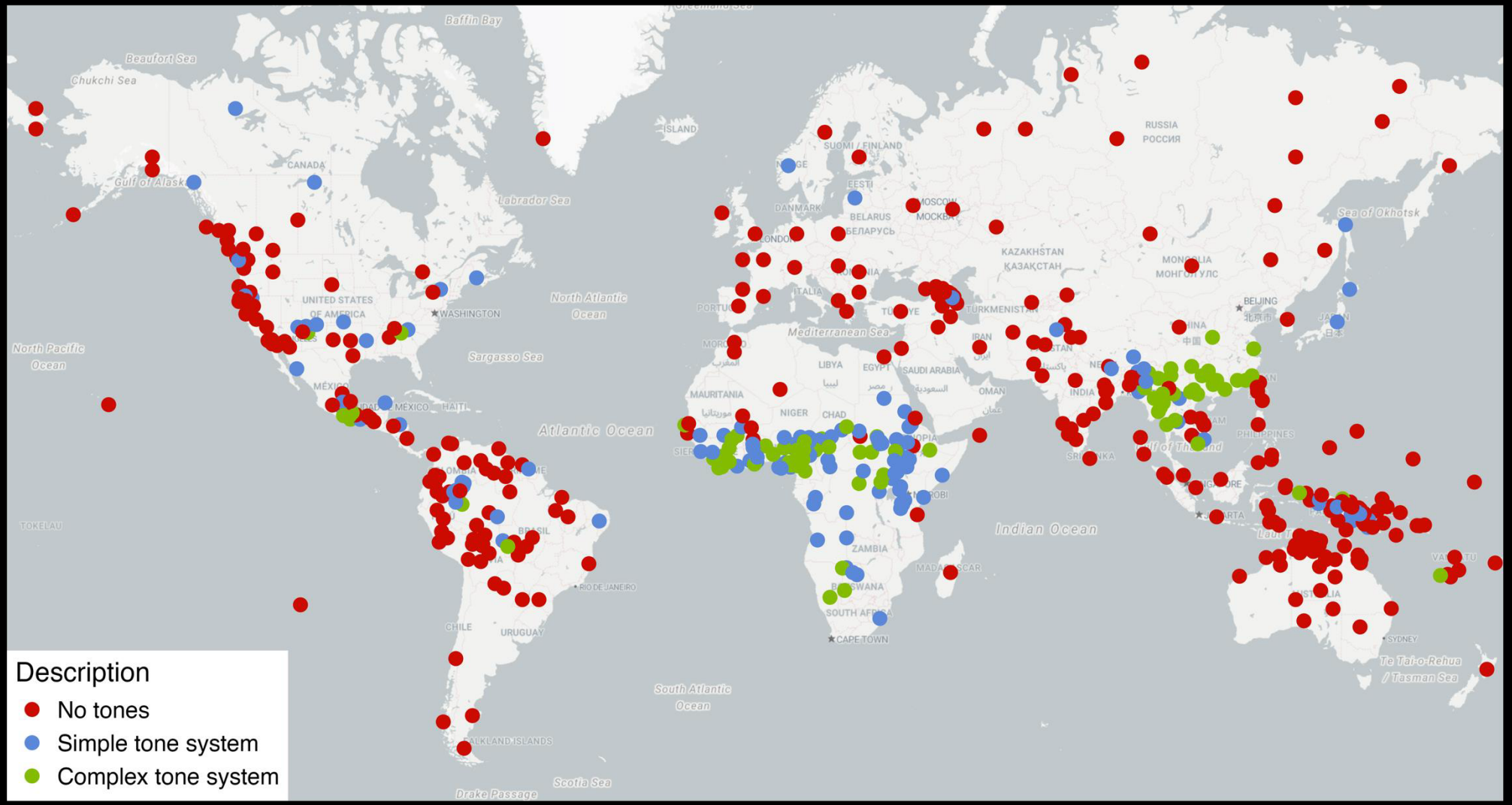
"no other phonological feature is treated with such indifference as tone"
(Hyman 2011)

Hyman 2011. *HB Phon Theory* | Moran et al. 2023. *Ling Typ 27(2)* | Yip 2002. *Tone*

Grambank (Skirgård et al. 2024)

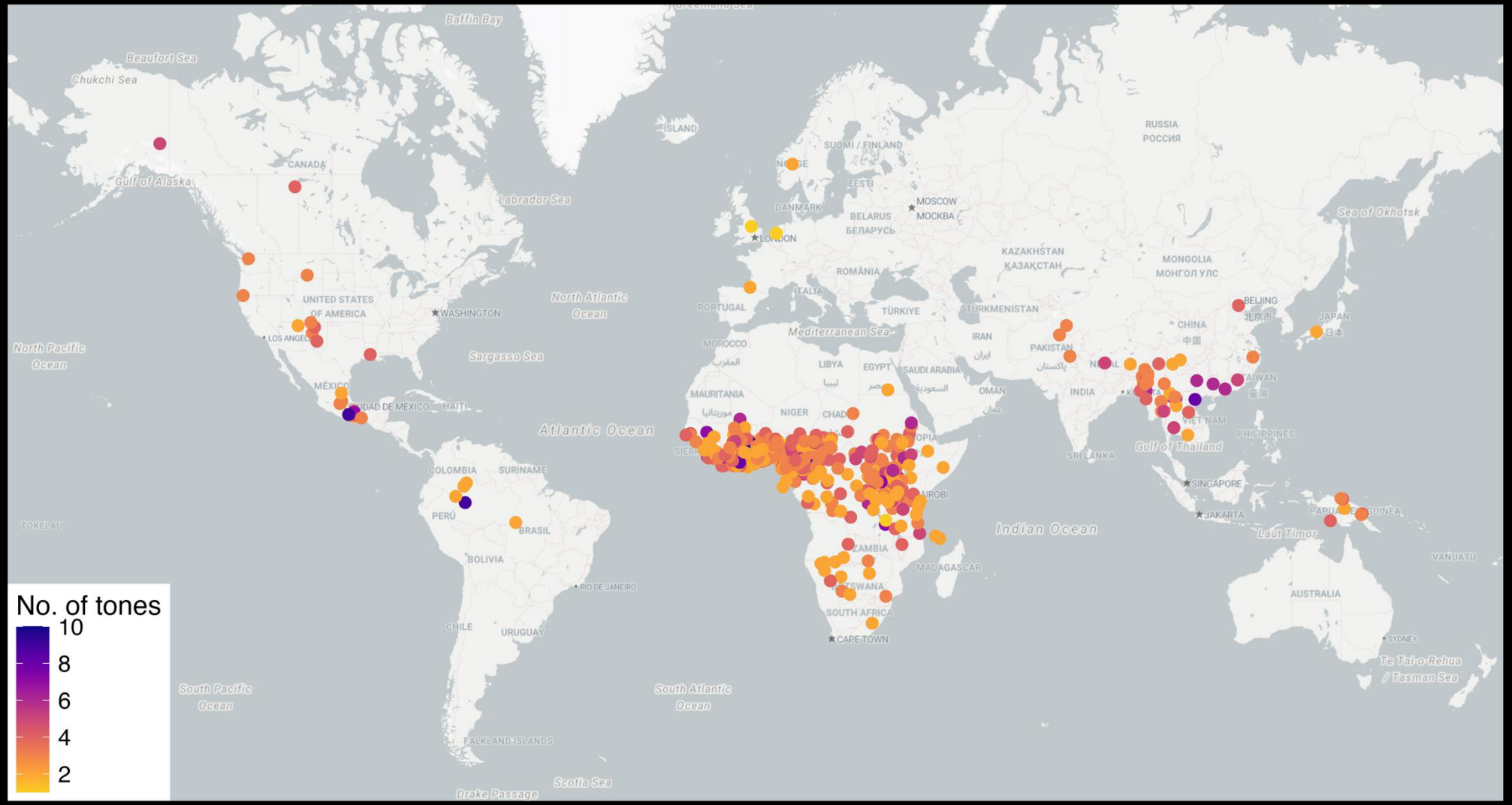
- no phonological features
- abstract, binary features (no forms)
- GB291 explicitly mentions tone (for the marking of polar interrogatives)

WALS (Dryer & Haspelmath 2013)

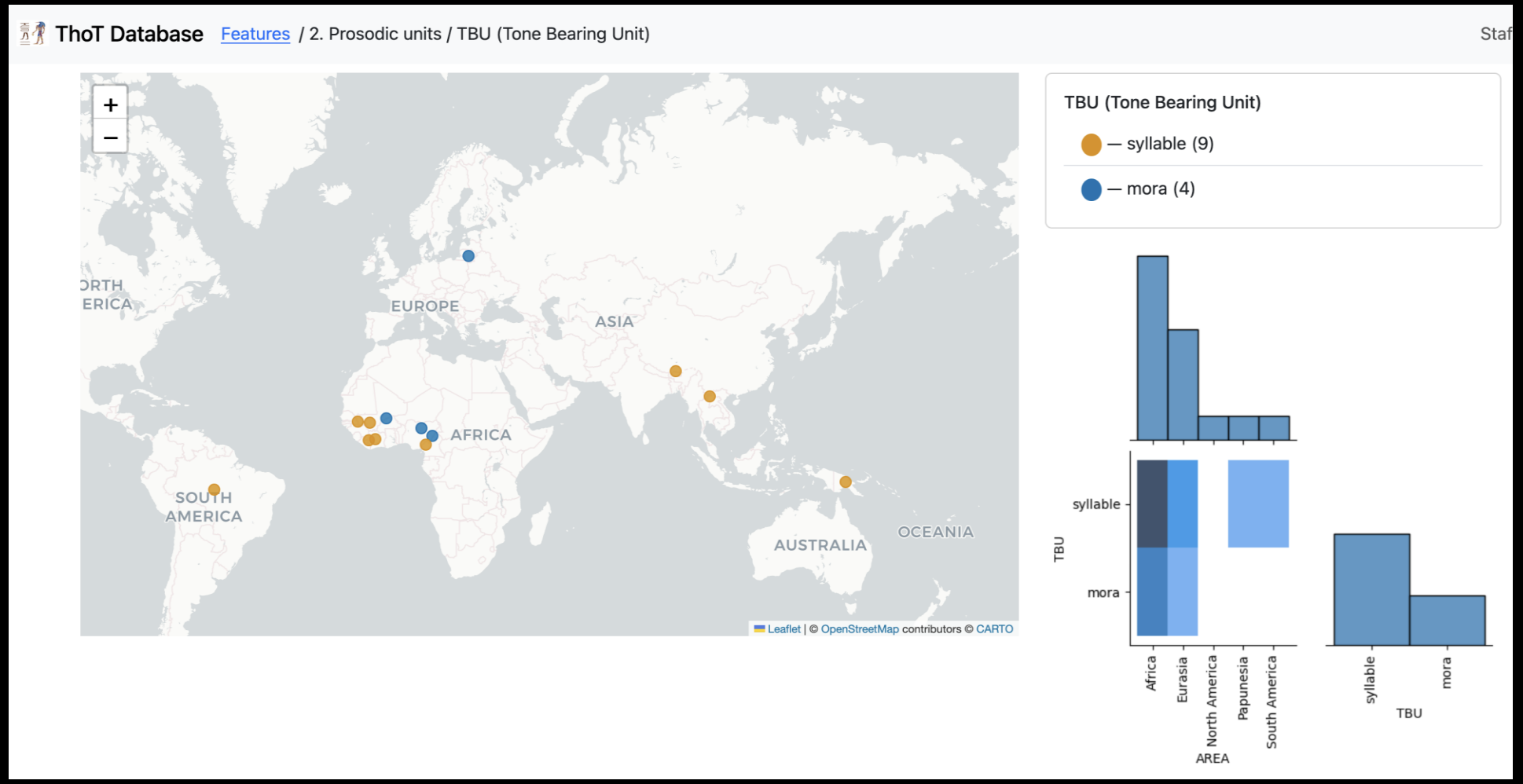


Feature 13A
(Maddieson 2013)

PHOIBLE 2.0 (Moran & McCloy 2019)



Theory of Tone (Vydrin & colleagues)



https://thot.huma-num.fr/

Area/family/subsystem-specific typologies

Property-driven/canonical tone typology (Hyman 2009, 2015)

tone systems & tone domains in Bodish (Tibeto-Burman) (Hildebrandt 2007)

Contour tone restrictions (Gordon 2001)

Diversity of tone in Papua (Cahill 2011)

Inflectional tone in Otomanguean (Palancar et al. 2016)

Tonal exponence typology (Kaldhol 2024)

Tone and phonation in SEA (Brunelle & Kirby 2016)

Grammatical tone typology (Rolle 2018)

Brunelle & Kirby 2016. LL Compass 10(4) | Cahill 2011. SIL WP | Hildebrandt 2007. New Chall.| Gordon 2001. St. in Lang 23 (3)| Hyman 2009.L Sci 31(2-3); 2015 Tono, accento | Kaldhol 2024. Morph |Palancar et al. Tone & Infl. |

Comparison of tonal systems

Linguistic Typology

classification into broad, language-level types

multivariate/ distributional typology

family-level comparison & microtypology

comparison of evolutionary processes

simple vs. complex tone system
number of tones
types of tones (H, L, etc.)

WALS
PHOIBLE

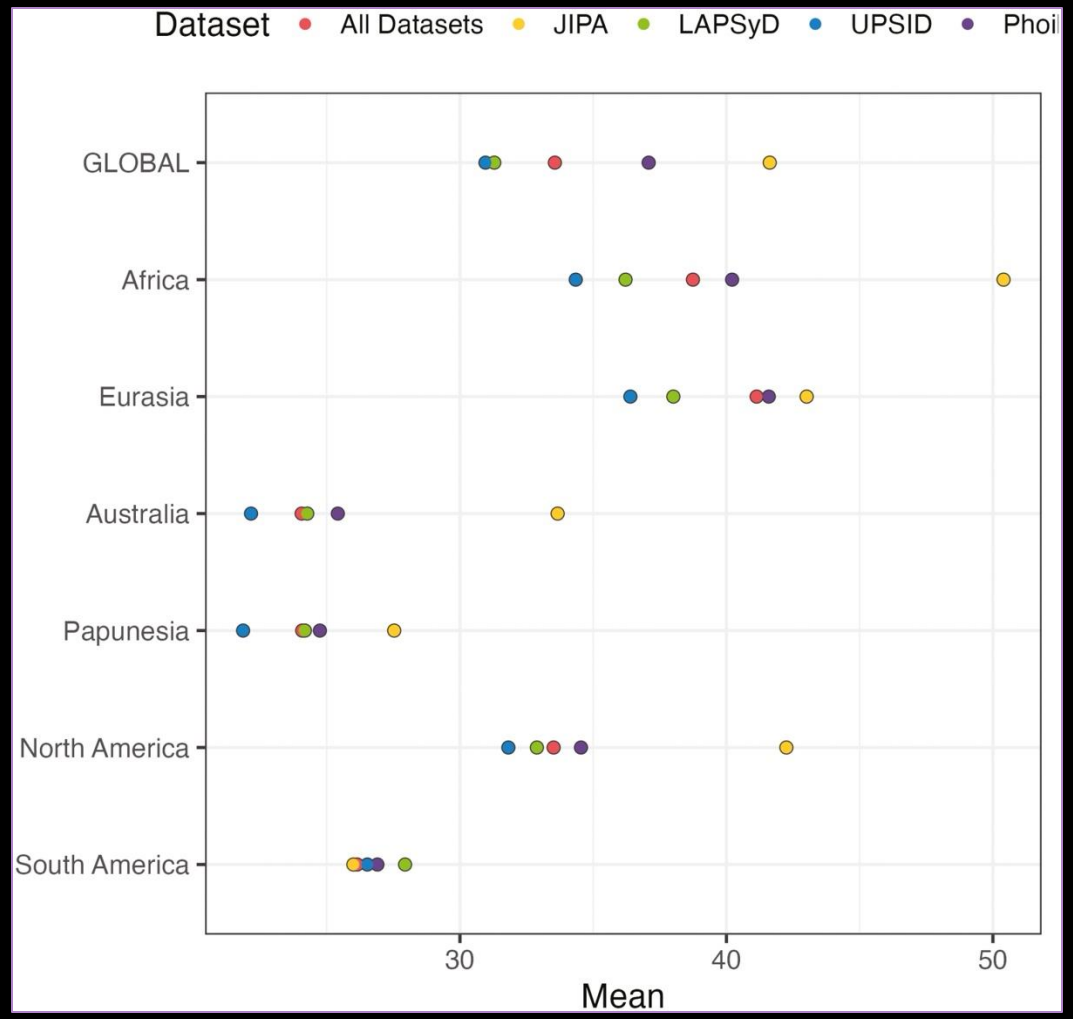
family-/area-/subsystem-specific studies

codable, top-down traits (TBU, levels, etc.)

Theory of Tone

?

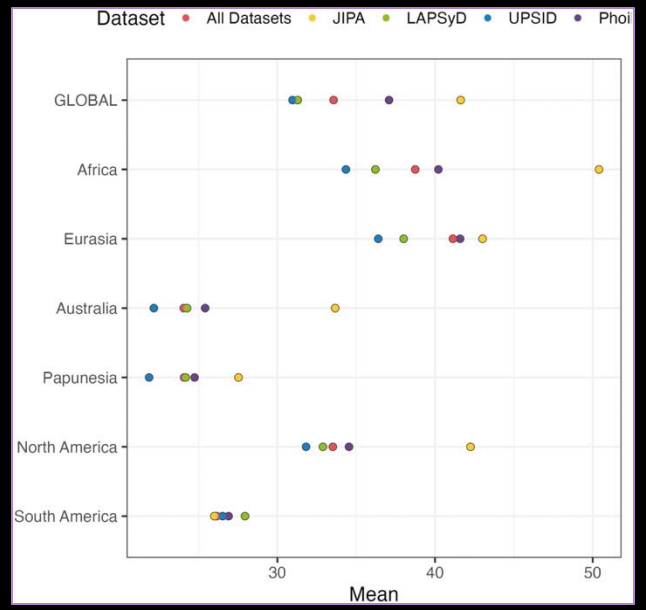
The problem with counting segments



"Scholarly work has used phoneme inventories as evidence for studies across a wide range of topics, with an implicit assumption that they constitute a reliable and robust source of data. However, our results sound a note of caution for these studies."

Anderson et al. 2023. *J of Lang. Evolution* 8(2)

The problem with counting tones

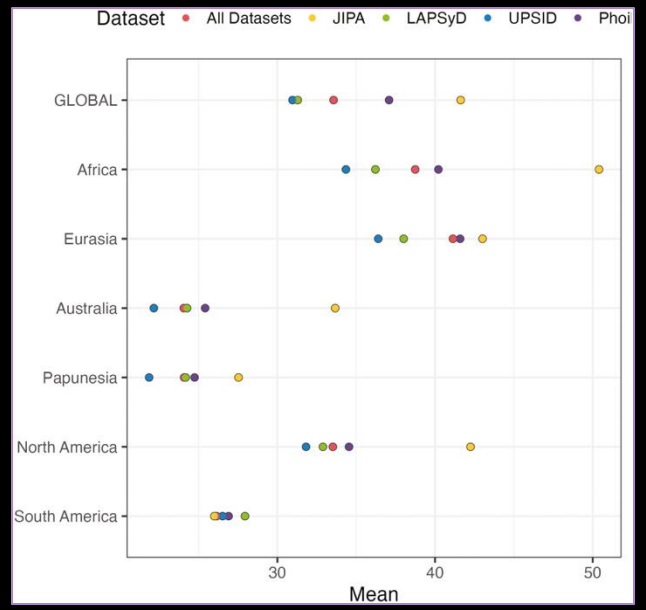


Anderson et al. 2023. *J of Lang. Evolution* 8(2)

- counting tones is even more problematic than counting in the case of segmental inventories
  - even more sensitive to analytical choices
  - smaller range, less granularity
  - unclear what we are even counting

Level	Speech sound	Smallest contrastive unit	Smallest meaningful unit
segments	phone allophone	phoneme	morpheme
tones	tone allotone	tone toneme	tonal morpheme toneme

The problem with counting tones



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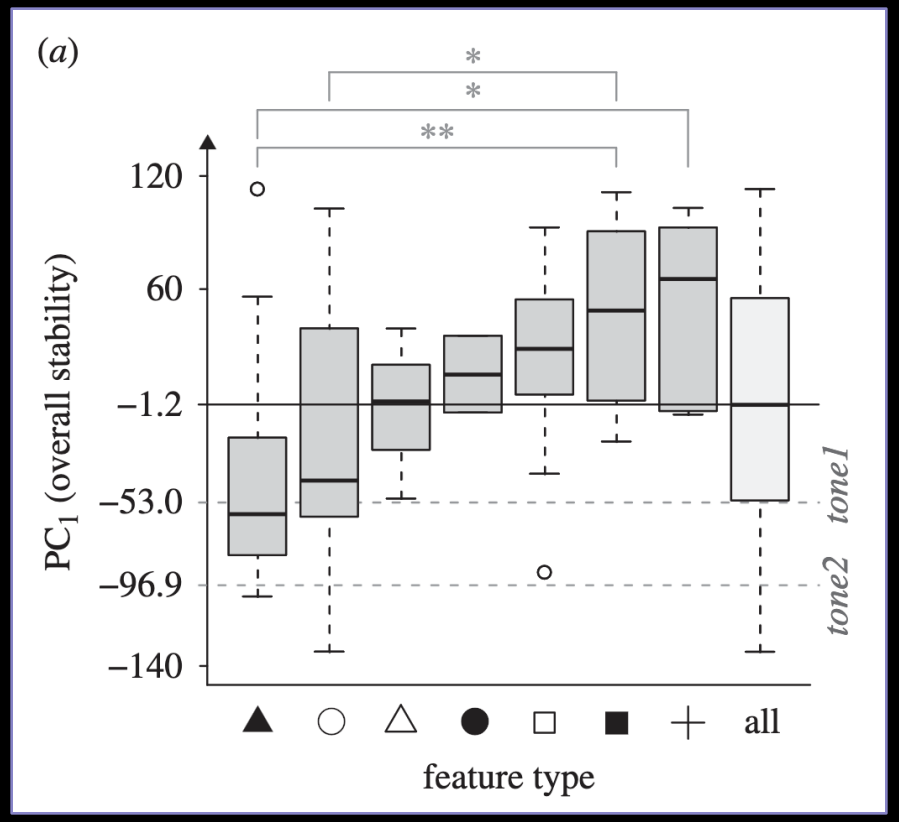
Level	Speech sound		Smallest contrastive unit		Smallest meaningful unit
segments	phone allophone	37’000	phoneme	350’000	morpheme
tones	tone allotone	580	tone toneme	2’700	tonal morpheme toneme

Why this matters: genes and tone

less stable

more stable



PROCEEDINGS OF THE ROYAL SOCIETY B

Proc. R. Soc. B (2011) **278**, 474–479
doi:10.1098/rspb.2010.1595
Published online 1 September 2010

A Bayesian phylogenetic approach to estimating the stability of linguistic features and the genetic biasing of tone

Dan Dediu*

no tone vs. tone

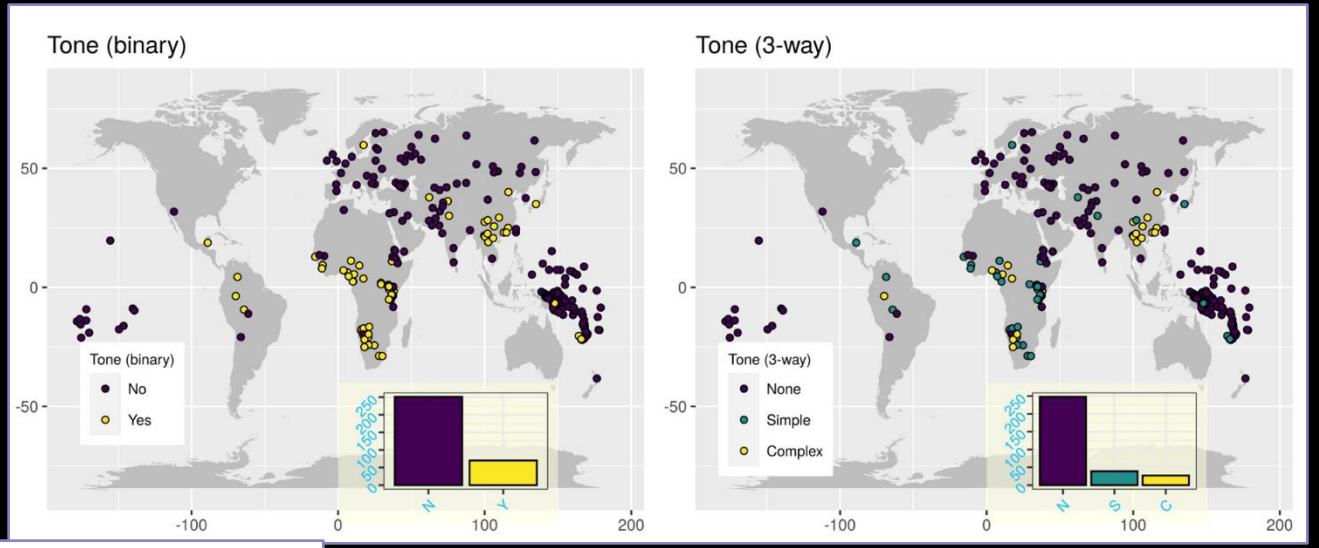
complex tone vs. simple/no tone

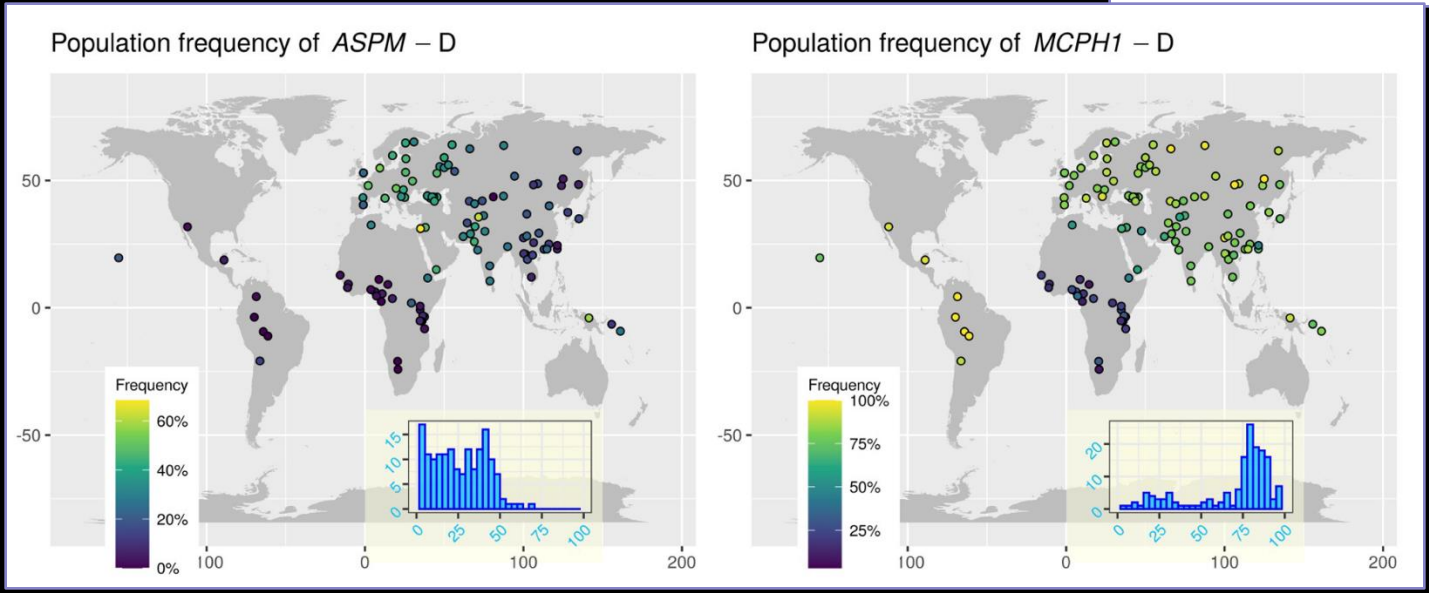
Why this matters: genes and tone

RESEARCH ARTICLE

Tone and genes: New cross-linguistic data and methods support the weak negative effect of the "derived" allele of *ASPM* on tone, but not of *Microcephalin*

Dan Dediu *





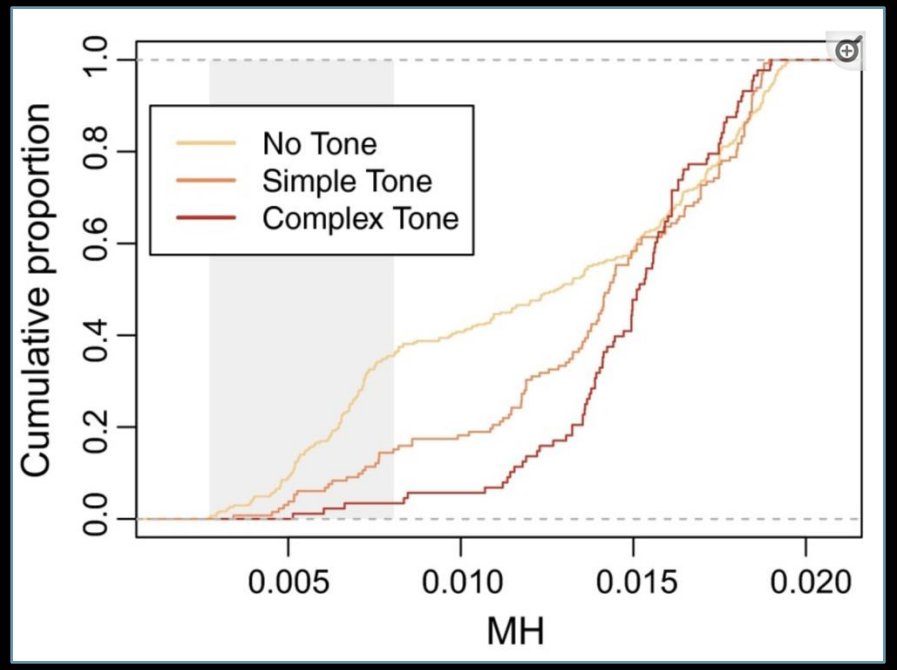
Dediu 2021. *PLOS One* 16(6)

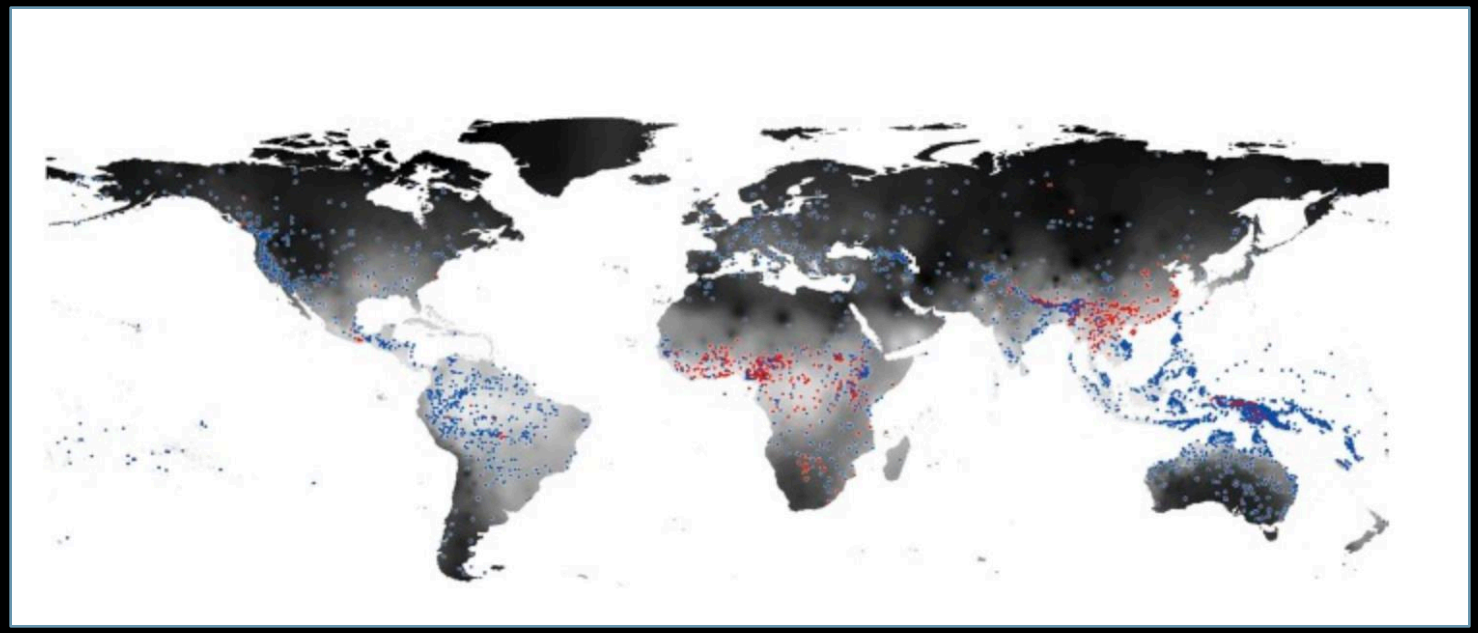
Why this matters: climate and tone

Climate, vocal folds, and tonal languages: Connecting the physiological and geographic dots

Caleb Everett[a,1], Damián E. Blasi[b,c], and Seán G. Roberts[d]

distribution of language locations by mean humidity





red = complex tone
blue = no complex tone

dark shading = lower mean humidity
light shading = higher mean humidity

Comparability issues

"[T]he prosodic category stress in West Germanic languages, which implicitly underlies practically all work on stress, *is a complex cluster concept consisting of at least six dimensions which in turn involve a number of subdimensions. Because of its complexity, this concept is not useful for cross-linguistic comparison*."
(Himmelmann 2023; emphasis mine)

Compartmentalize & Compare

1. acoustic and auditory prominence
2. phonotactic structure, phonological alternations
3. metrical structure (foot structure)
4. lexical structure
5. function in text-tune alignment (intonational anchoring)
6. function in conveying information-structural distinctions

→ break these components down into measurable and codable variables

→ compare the variables

Himmelmann 2023. Ling Typ 27(2)

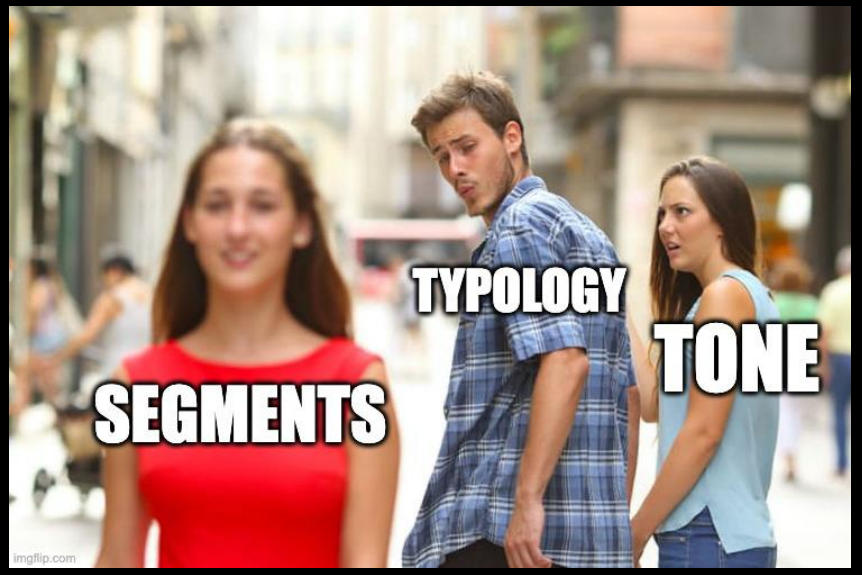
Comparability issues

Rethinking language comparison
→ return to a more systemic understanding of language
→ defragmentation and focus on interaction

“When we analyse African tonal languages, things get even worse. Instead of a few typology-challenging anomalies as in Tamashek, *almost the whole grammar can become a tissue of language-specific interactions between tonal patterning and grammatical categories*, tenuously held together by subtle language-specific motifs."
(Heath 2016; emphasis mine)

Heath 2016. Ling Typ 20(3)

Comparability issues



Rethinking language comparison
→ return to a more systemic understanding of language
→ defragmentation of typology and focus on interaction

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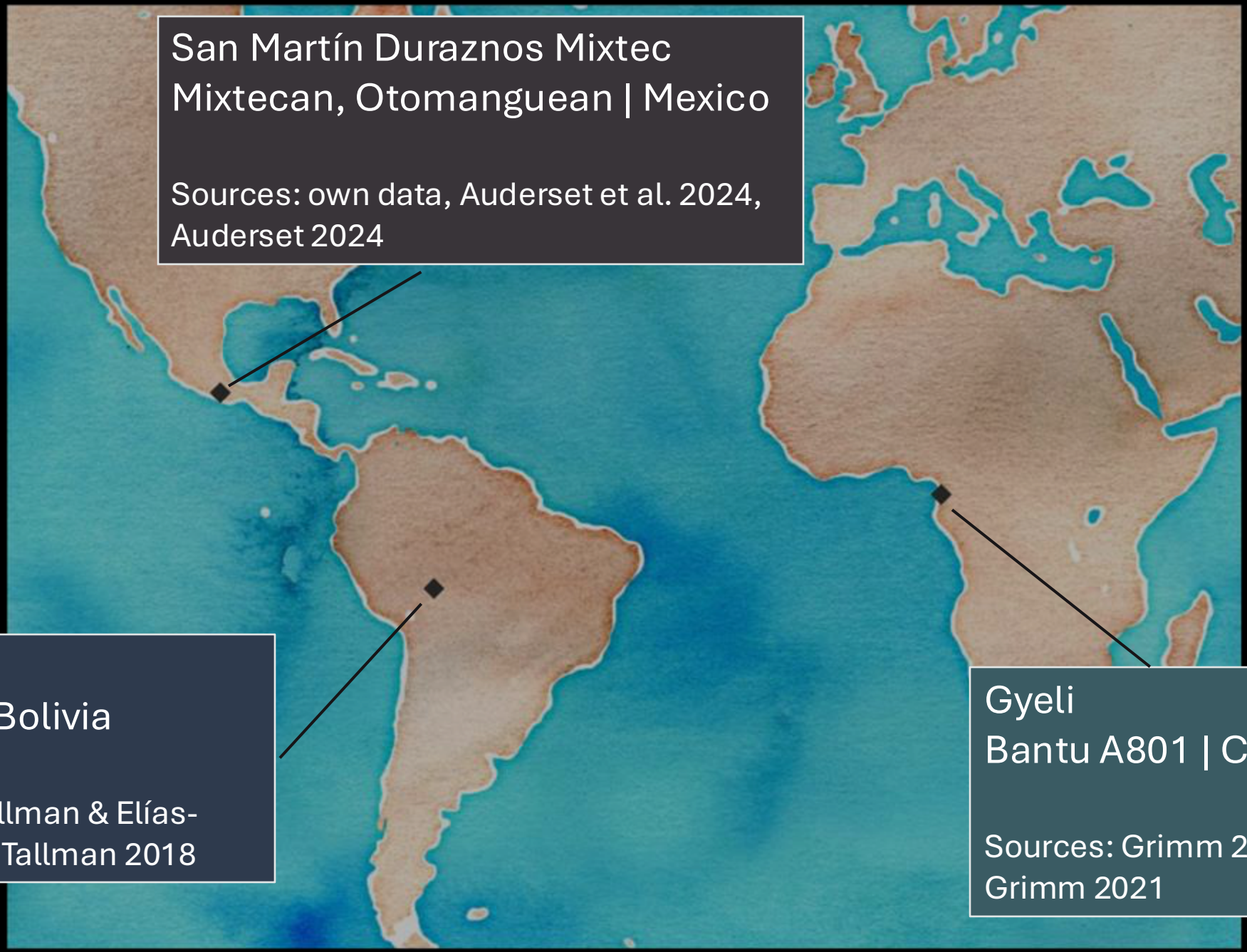


Auderset et al. 2024. *Constituency in Duraznos Mixtec* LSP; Auderset 2024. *J Lang Evo 14(1)* | Grimm 2022. *Phonology* 39(3); Grimm 2021. *Grammar of Gyeli* LSP | Tallman & Elías-Ulloa 2020. *JASA* 147; Tallman 2018. *Grammar of Chácobo* UT Austin

Overview of tone inventories and properties

Feature	Chácobo	Duraznos Mixtec	Gyeli
Tones # (with TL vs. without)	H, Ø 2 ~ 1	H, M, L 3	H, L, R, F, Ø 5 ~ 4
T(one)B(earing)U(nit)	mora or syllable	mora	syllable
Density	not every TBU specified for tone	every TBU specified for tone	not every TBU specified for tone
Culminativity	on some level	no	no
Co-occurrence restrictions	no	no	no
Lexical tone	yes	yes	yes
Grammatical tone	yes	yes	yes
Processes	floating H-tone, tone sandhi	(limited) tone sandhi, L-tone dissimilation	high tone spreading
Other contrastive suprasegmentals	fixed stress	fixed stress, nasalization, length	nasalization, length

Labels:
H = high
M = mid
L = low
R = rising
F = falling
Ø = toneless

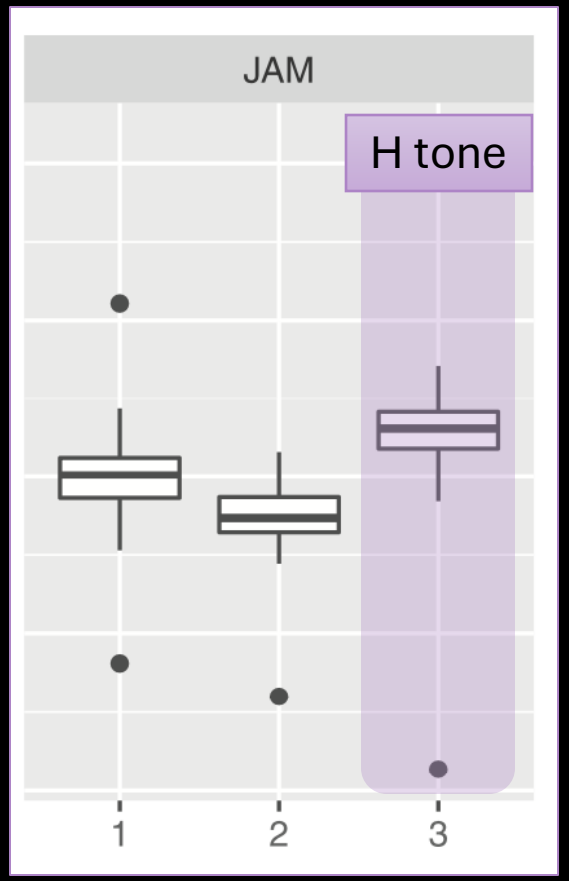
Chácobo

Phonology

Category	Domain	Realization
High Tone	any syll.	H ~ L
Toneless	any syll.	L ~ 0
Stress	first two syll.	#H ~ #M

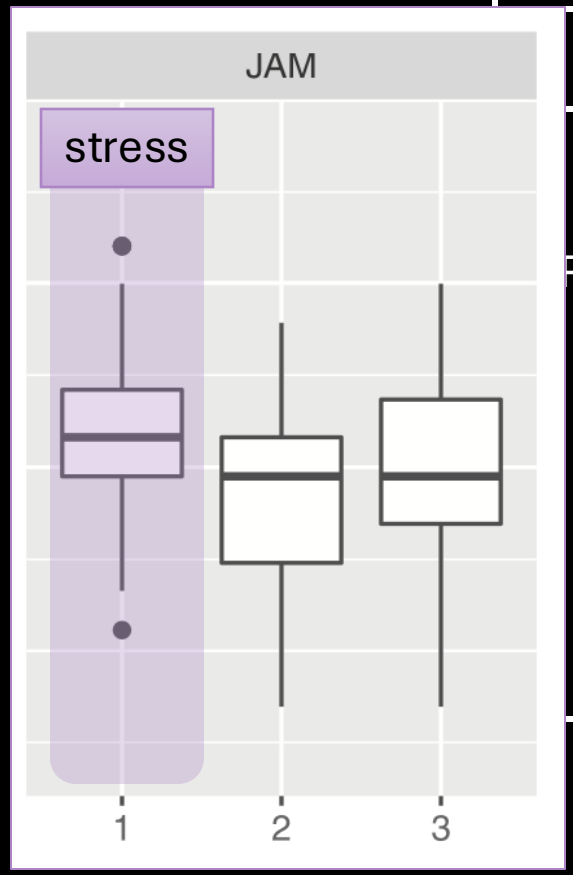
Chácobo

F0 (pitch)



syllables

Intensity



syllables

Phonetics

Category	Primary corr.	Secondary corr.
High Tone	pitch	duration
Stress	intensity	duration

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Chácobo

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Lexicon /Contrasts

Form	Gloss	PoS
káʂa	be angry	V intr.
kaʂá	play	V intr.
áni	lake	N
aní	grow	V
raβi	Rabi	N
rámi	Rami	N

Chácobo

Grammar/Function

ERGATIVE/GENITIVE:
H on final syllable of noun phrase erases all other H on the element it appears on

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Lexicon /Contrasts

(24) [tʃá.ʂo **ka.ma.nó** kɨ.jó.ɾo.ʔá.kɨ]
tʃáʂo kamáno=´ kɨjó=ɾoʔá= kɨ
deer jaguar=erg finish=limit=dec:pst
"The jaguar only finished the deer"

Chácobo

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Lexicon /Contrasts

Process	Target	Constituency
Min. tone insertion	Prefixes to Adverbials	do not converge with other phonological or morphosyntactic constituents
Max. tone insertion	up to clause type	
Min. tone deletion	NP to end of clause	
Max. tone deletion	whole clause	

Morphosyntax

Chácobo

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Morphosyntax

Process	Target	Constituency
Min. tone insertion	Prefixes to Adverbials (7-17)	do not converge with other phonological or morphosyntactic constituents
Max. tone insertion	up to clause type (1-24)	
Min. tone deletion	NP to end of clause (6-27)	
Max. tone deletion	whole clause (1-27)	

Chácobo

Diachrony

Source of H:
stressed heavy syllables

Phonetics

Category	Primary corr.	Secondary corr.
High Tone	pitch	duration
Stress	intensity	duration

Grammar/Function

Probable source of ERG:
suffix –n + stress shift

ERGATIVE/GENITIVE:
H on final syllable of noun phrase erases all other H on the element it appears on

Phonology

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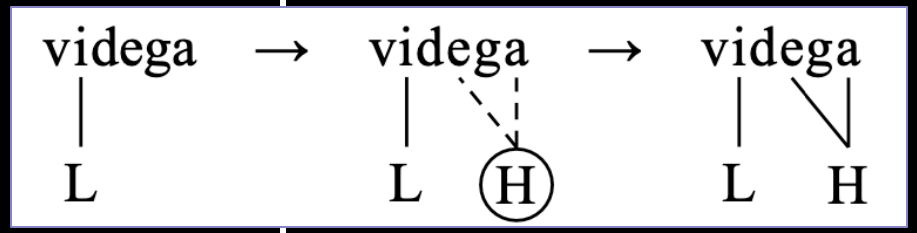
Gyeli

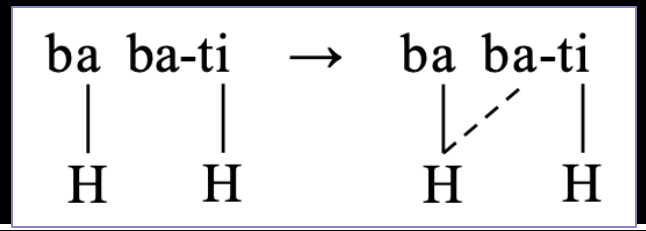
Phonology

H-tone spreading on toneless TBUs
nominal domain: left to right
verbal domain: right to left



V ‘turn’

N ‘in-laws’



Level	Contour
H	F
L	R
ø (realized as L or H)	

Gyeli

Phonology

Level	Contour
H	F
L	R
ø (realized as L or H)	

Table 1. *Distribution of level tones in noun stems.*

Tonal pattern	Frequency		Example	
σ	(119/224)	53.1%		
L	57	47.9%	ndɛ̀	'bait'
H	62	52.1%	nká	'line, row'
σσ	(518/555)	93.3%		
L L	115	22.2%	ntɔ̀ngɛ̀	'hornet, wasp'
H H	148	28.6%	njímí	'blind person'
L H	106	20.5%	vìnɔ́	'finger'
H L	150	29.0%	djínɔ̀	'name'
σσσ	(86/90)	95.6%		
L L L	26	29.1%	bèngvùdɛ̀	'golden angwantibo'
H H H	14	17.4%	títímɔ́	'middle'
L H H	6	7.0%	ndzìmɔ́zɔ́	'guard'
H L L	13	15.1%	mpí'ìdì	'heat (from fire)'
L H L	10	11.6%	sìsímù	'shadow (of person)'
H L H	3	3.5%	nkúmbɔ̀lɔ́	'diarrhea'
L L H	5	5.8%	mìntùlí	'mouse'
H H L	9	10.5%	dyúngúlɛ̀	'chameleon'

Lexicon

Verbs	Ex.	Gloss
L	ba`	PRS.smoke.sth
H	ba´	PRS.marry
L ø (ø)	gyìbɔ	PRS. sharpen
H ø (ø)	gyíbɔ	PRS.call

Nouns	Gloss
síŋgi´	squirrel
sìŋgi`	spirit
síŋgi`	cat
mbɛ̂	door
mbɛ`	drum

Gyeli

Grammar/Function

Category	STAMP tone	Verb tone
PRS.F	H	XL
PRS.M	H	XH
INCH.F	LH	XL
INCH.M	LH	XH
PST1	L	XH
PST2	L	XH
FUT	H	XL
IMP	(H)	XHL
SUBJ	H	XH.L

Table 3. *Tense–mood forms with L- and H-toned verb roots.*

TAM	STAMP	σ		σσ		σσσ		STAMP V	
		L	H	L	H	L	H		
	1PL	*bà*	*bá*	*gyìbɔ*	*gyíbɔ*	*pàgala*	*págala*		
PRS_F	yá	bà	bâ	gyìbɔ̀	gyíbɔ̀	pàgàlà	págàlà	H	XL
PRS_M	yá	bá	bá	gyìbɔ́	gyíbɔ́	pàgálá	págálá	H	XH
$INCH_F$	yàá	bà	bâ	gyìbɔ̀	gyíbɔ̀	pàgàlà	págàlà	LH	XL
$INCH_M$	yàá	bá	bá	gyìbɔ́	gyíbɔ́	pàgálá	págálá	LH	XH
$PST1_{F,M}$	yà	bá	bá	gyìbɔ́	gyíbɔ́	pàgálá	págálá	L	XH
$PST2_{F,M}$	yáà	bá	bá	gyìbɔ́	gyíbɔ́	pàgálá	págálá	L	XH
$FUT_{F,M}$	yáà	bà	bâ	gyìbɔ̀	gyíbɔ̀	pàgàlà	págàlà	H	XL
$IMP_{F,M}$	(yá)	bâ	bâ	gyìbɔ̂	gyíbɔ̂	pàgálâ	págálâ	(H)	XHL
$SBJV_{F,M}$	yá	báà	báà	gyìbɔ́ɔ̀	gyíbɔ́ɔ̀	pàgáláà	págáláà	H	XH.L

Gyeli

Object-marking H tone: realized on the element immediately following the verb

Grammar/Function

mɛ̀ɛ̀	gyámbɔ̀	**bé**kwàndɔ̀
mɛ̀ɛ̀	gyámbɔ	H be-kwàndɔ̀
1SG.FUT	cook	OBJ.LINK be8-plantain

‘I will/might cook plantains.’

Gyeli

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INCH.M	LH	XH
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PST2	L	XH
FUT	H	XL
IMP	(H)	XHL
SUBJ	H	XH.L

Phonology

Grammatical tone overwrites lexical tone only when there are not enough toneless syllables

H-tone spreading on toneless TBUs
nominal domain: left to right
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Level	Contour
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H ø (ø)	gyíbɔ	PRS.call

Nouns +	Gloss
síŋgi´	squirrel
sìŋgi`	spirit
síŋgi`	cat
mbɛ̂	door
mbɛ`	drum

Lexicon

Gyeli

Grammar/Function

Object-marking H tone: realized on the element immediately following the verb

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PRS.F	H	XL
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PST2	L	XH
FUT	H	XL
IMP	(H)	XHL
SUBJ	H	XH.L

Phonology

Grammatical tone overwrites lexical tone only when there are not enough toneless syllables

H-tone spreading on toneless TBUs
nominal domain: left to right
verbal domain: right to left

Level	Contour
H	F
L	R
ø (realized as L or H)	

Diachrony

Probable sources of GT:
Segments+Tone > Tone as sole exponent
Lexical tones are reconstructable to Proto-Bantu

Lexicon

Verbs	Ex.	Gloss
L	ba`	PRS.smoke.sth
H	ba´	PRS.marry
L ø (ø)	gyìbɔ	PRS. sharpen
H ø (ø)	gyíbɔ	PRS.call

Nouns +	Gloss
síŋgi´	squirrel
sìŋgi`	spirit
síŋgi`	cat
mbɛ̂	door
mbɛ`	drum

Duraznos Mixtec

5 = high
3 = mid
1 = low

Toneme	Allotones
H	--
M	H / L_#+L
L	F / M_#+H

Melodies (lexical domains)		
H.H	M.H	L.H
H.M	M.M	L.M
H.L	M.L	L.L

Phonology

Table 3: Tonal minimal pairs exemplifying all nine contrastive tone melodies

DM	Gloss	Tones	DM	Gloss	Tones
ni⁵i⁵	hail	HH	*kʷa⁵ʔa⁵*	red	HH
ni⁵i¹	ICPL.carry	HL	*kʷa⁵ʔa³*	right (direction)	HM
ni³i¹	skin	ML	*kʷa³ʔa³*	POT.give	MM
ni¹i¹	salt; blood	LL	*kʷa¹ʔa¹*	a lot, much	LL
to³so⁵	hunchback	MH	*ⁿda³ki³*	strong	MM
to¹so³	arch	LM	*ⁿda¹ki⁵*	pozole (type of stew)	LH
			ⁿda¹ki³	broom	LM
ʒo¹so⁵	quern	LH			
ʒo³so¹	grassland	ML			

Duraznos Mixtec

5 = high
3 = mid
1 = low

Phonology

Toneme	Allotones
H	--
M	H / L_#+L
L	F / M_#+H

Melodies (lexical domains)		
H.H	MH	LH
HM	MM	LM
HL	ML	LL

Form	Gloss	PoS
$ni^{1}i^{1}$	salt	N
$ni^{1}i^{3}$	skin	N
$ni^{5}i^{5}$	hail	N
$ka^{3}\tilde{a}^{3}$	make holes	V
$ka^{1}\tilde{a}^{3}$	get used to	V

Lexicon/
Contrasts

Duraznos M.

POT	INCPL	COMPL	Gloss	Class
ɕa^{1}a^{1}	ɕa^{5}a^{1}	i^{1}-ɕa^{1}a^{1}	‘arrive’	1a
ka^{3}sũ^{3}	ka^{5}su^{5}	i^{1}-ka^{3}sũ^{3}	‘be fried’	1b
ku^{3}tʃi^{3}	ʃi^{5}tʃi^{3}	i^{1}-ʃi^{3}tʃi^{3}	‘take a bath’	2a
ka^{1}ʔnu^{1}	ɕa^{5}ʔnu^{1}	i^{1}-ɕa^{1}ʔnu^{1}	‘break, fold’	3a
ka^{3}tɕa^{3}	ɕa^{5}tɕa^{5}	i^{1}-ɕa^{3}tɕa^{3}	‘throw, dig up’	3b
ku^{3}-na^{1}ʔa^{1}	na^{5}ʔa^{1}	i^{1}-ɕi^{1}-na^{1}ʔa^{1}	‘look like’	4a
ku^{3}-ʒa^{5}ʔa^{5}	ʒa^{5}ʔa^{5}	i^{1}-ku^{3}-ʒa^{5}ʔa^{5}	‘be yellow’	4b

Grammar/Function

Class	POT		INCPL	COMPL	
1a		X.X	H.X	i^{1}-	X.X
1b		X.X	H.H	i^{1}-	X.X
2a/3a		kX.X	ɕH.X	i^{1}-	ɕX.X
3b		kX.X	ɕH.H	i^{1}-	ɕX.X
4a	ku^{3}-	X.X	H.X	i^{1}-ɕi^{1}-	X.X

Duraznos M.

Grammar/Function

Derivational H:
N → Vstat
(not productive)

N		Vstat/ADJ	
i³ʃi¹	hair	i¹ʃi⁵	hairy, bearded
tu³ũ¹	charcoal	tu¹ũ⁵	black
so¹ʔo³	ear	so⁵ʔo⁵	deaf
ⁿdi⁵ʔi¹	(tree) trunk	ⁿdi³ʔi⁵	full-bodied

Duraznos Mixtec

Phonology

Toneme	Allotones
H (5)	--
M (3)	H / L_#+L
L (1)	F / M_#+H

Melodies (lexical domains		
HH	MH	LH
HM	MM	LM
HL	ML	LL

Grammar/Function

Derivational H:
N → Vstat
(not productive)

Class	POT		INCPL	COMPL	
1a		X.X	H.X	i^{1}-	X.X
1b		X.X	H.H	i^{1}-	X.X
2a/3a		kX.X	ɕH.X	i^{1}-	ɕX.X
3b		kX.X	ɕH.H	i^{1}-	ɕX.X
4a	ku^{3}-	X.X	H.X	i^{1}-ɕi^{1}-	X.X

Form	Gloss	PoS
ni^{1}i^{1}	salt	N
ni^{1}i^{3}	skin	N
ni^{5}i^{5}	hail	N
ka^{3}ã^{3}	make holes	V
ka^{1}ã^{3}	get used to	V

Lexicon/
Contrasts

Duraznos Mixtec

Sandhi processes of dependent pronouns conditioning: PoS, tone, and syllable structure of the previous element

Phonology

Toneme	Allotones
H (5)	--
M (3)	H / L_#+L
L (1)	F / M_#+H

Melodies (lexical domains		
HH	MH	LH
HM	MM	LM
HL	ML	LL

PRONOUN(S)	DEFAULT	Sandhi with N	Sandhi with V
1SG	L	HL / L_	
2SG.NHON	copy	H / XʔM_	
1PL.EXCL, 3SG.M, 3PL, 3GEN	L	M / {HL}ʔM_ M / L(ʔ)L_	M / X.M_
1PL.INCL, 2PL, 3SG.F, 3ZOO, 3WOOD	L	H / {HL}ʔM_	H / X.M_

Form	Gloss	PoS
$ni^{1}i^{1}$	salt	N
$ni^{1}i^{3}$	skin	N
$ni^{5}i^{5}$	hail	N
$ka^{3}\tilde{a}^{3}$	make holes	V
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Lexicon/ Contrasts

Duraznos Mixtec

Sandhi processes of dependent pronouns conditioning: PoS, tone, and syllable structure of the previous element

Phonology

Toneme	Allotones
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M (3)	H / L_#+L
L (1)	F / M_#+H

Grammar/Function

Derivational H:
N → Vstat
(not productive)

Melodies (lexical domains		
HH	MH	LH
HM	MM	LM
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Class	POT		INCPL	COMPL	
1a		X.X	H.X	i^{1}-	X.X
1b		X.X	H.H	i^{1}-	X.X
2a/3a		kX.X	ɕH.X	i^{1}-	ɕX.X
3b		kX.X	ɕH.H	i^{1}-	ɕX.X
4a	ku^{3}-	X.X	H.X	i^{1}-ɕi^{1}-	X.X

Form	Gloss	PoS
$ni^{1}i^{1}$	salt	N
$ni^{1}i^{3}$	skin	N
$ni^{5}i^{5}$	hail	N
$ka^{3}\tilde{a}^{3}$	make holes	V
$ka^{1}\tilde{a}^{3}$	get used to	V

Lexicon/
Contrasts

Duraznos Mixtec

Sandhi processes of dependent pronouns conditioning: PoS, tone, and syllable structure of the previous element

Phonology

Toneme	Allotones
H (5)	--
M (3)	H / L_#+L
L (1)	F / M_#+H

Grammar/Function

Derivational H:
N → Vstat
(not productive)

Melodies (lexical domains		
HH	MH	LH
HM	MM	LM
HL	ML	LL

Class	POT		INCPL	COMPL	
1a		X.X	H.X	i^{1}-	X.X
1b		X.X	H.H	i^{1}-	X.X
2a/3a		kX.X	ɕH.X	i^{1}-	ɕX.X
3b		kX.X	ɕH.H	i^{1}-	ɕX.X
4a	ku^{3}-	X.X	H.X	i^{1}-ɕi^{1}-	X.X

Form	Gloss	PoS
$ni^{1}i^{1}$	salt	N
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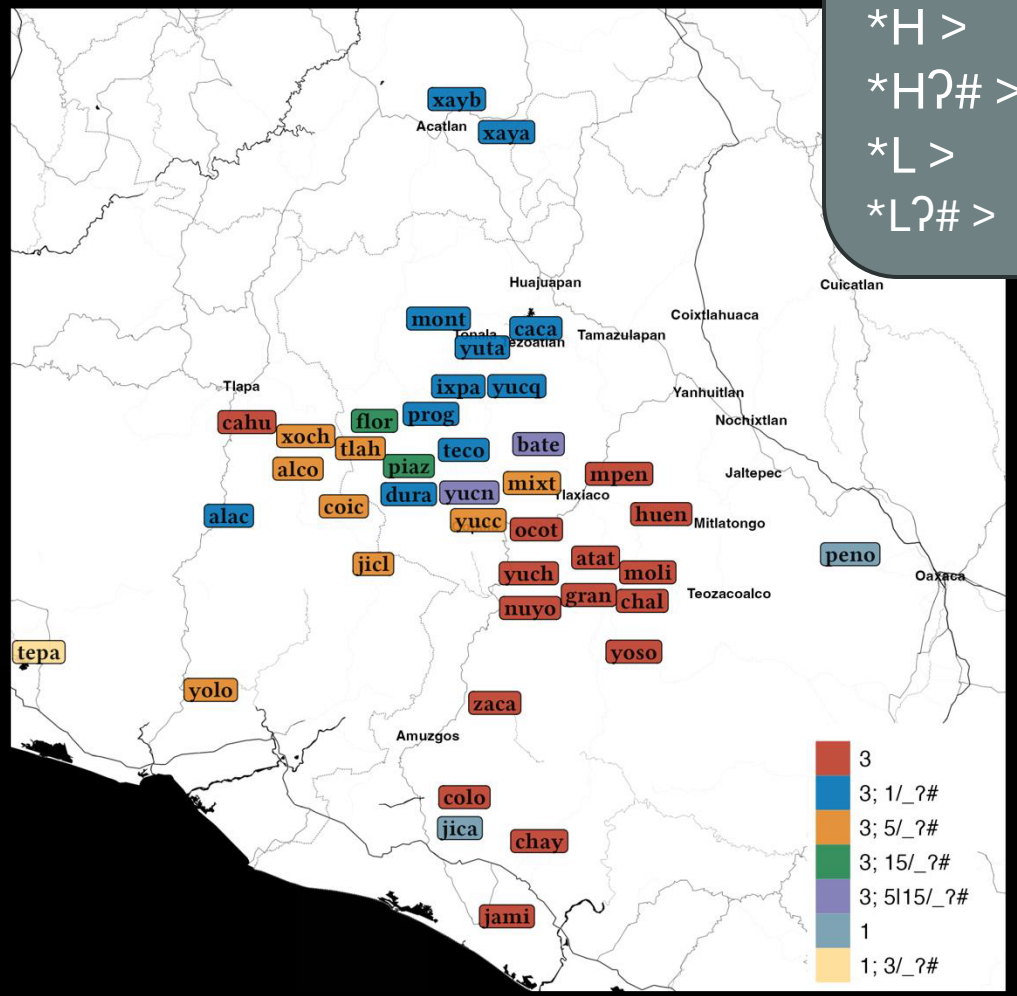
$ka^{1}\tilde{a}^{3}$	get used to	V

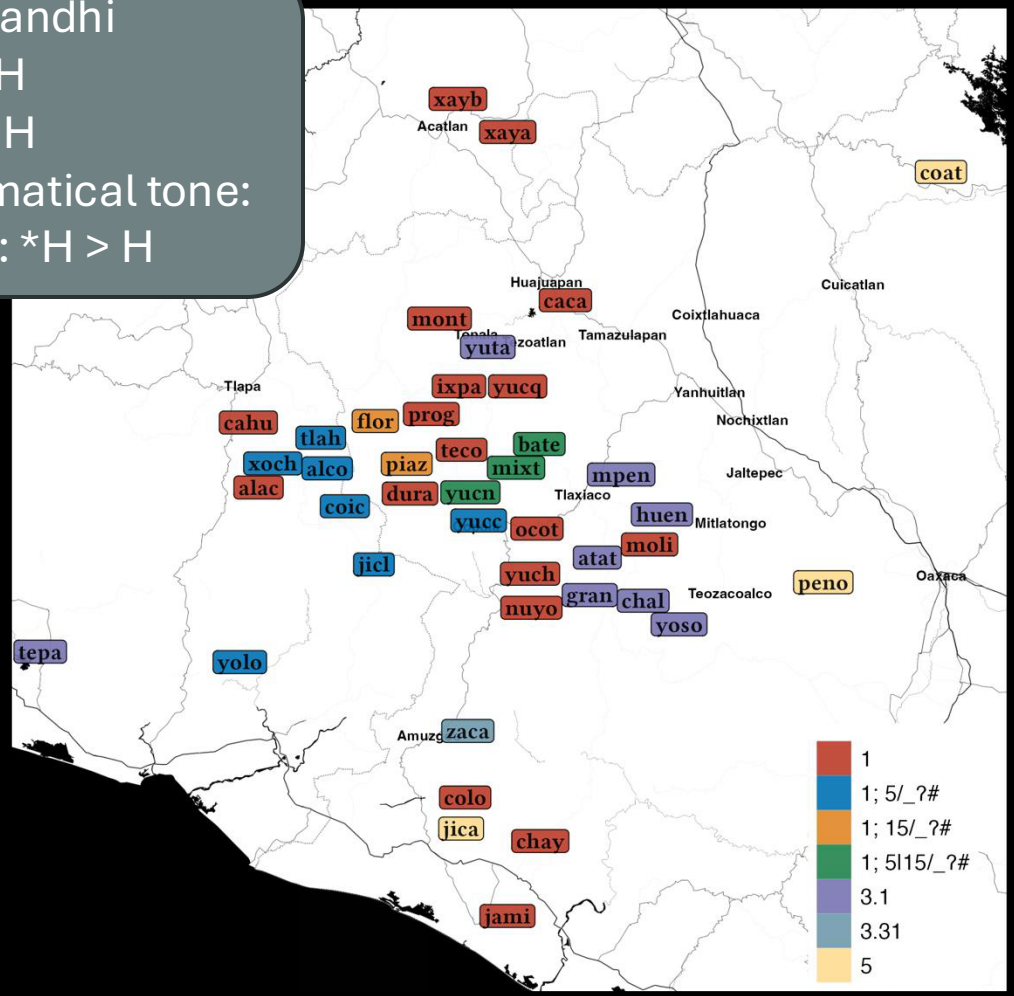
Lexicon/
Contrasts

Duraznos M.

Proto-Mixtec > Duraznos M.
Lexical tones
*H > M
*H?# > L
*L > L
*L?# > L

Tone Sandhi
*?.L > H
*?.H > H
Grammatical tone:
INCPL: *H > H





Duraznos Mixtec

Sandhi processes of dependent pronouns conditioning: PoS, tone, and syllable structure of the previous element

Phonology

Toneme	Allotones
H	--
M	H / L_#+L
L	F / M_#+H

Melodies (lexical domains		
HH	MH	LH
HM	MM	LM
HL	ML	LL

Grammar/Function

Derivational H:
N → Vstat
(not productive)

Proto-Mixtec

*H >	M	*ʔ.L >	H
*L >	L	*ʔ.H >	H
*Hʔ# >	L	INCPL: *H >	H
*Lʔ# >	L		

Diachrony

Class	POT		INCPL	COMPL	
1a		X.X	H.X	i^{1}-	X.X
1b		X.X	H.H	i^{1}-	X.X
2a/3a		kX.X	ɕH.X	i^{1}-	ɕX.X
3b		kX.X	ɕH.H	i^{1}-	ɕX.X
4a	ku^{3}-	X.X	H.X	i^{1}-ɕi^{1}-	X.X

Form	Gloss	PoS
$ni^{1}i^{1}$	salt	N
$ni^{1}i^{3}$	skin	N
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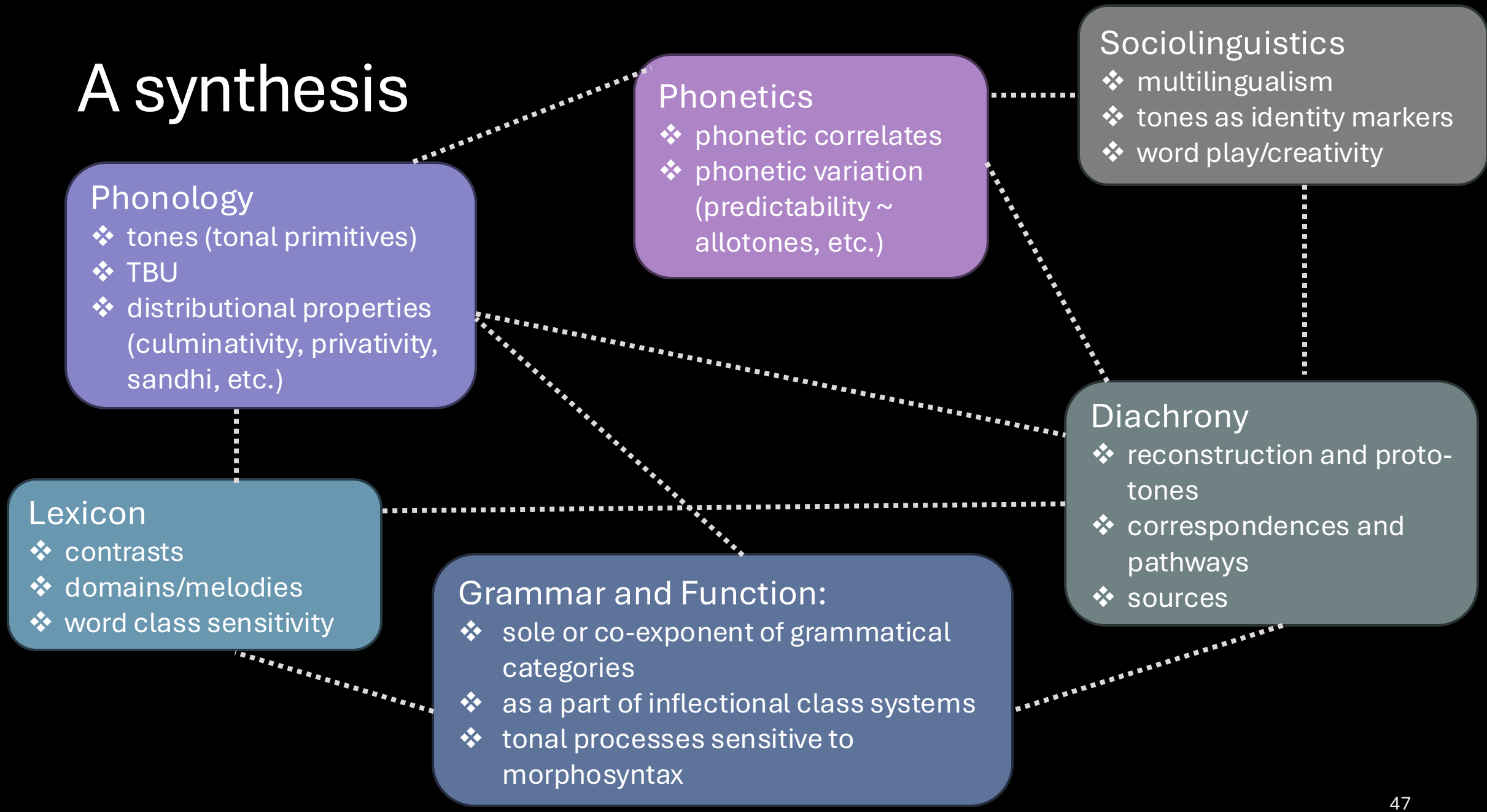
Lexicon/
Contrasts

Parallels

- the number of tones tells us little about the complexity of the system
- prosodic restructuring as the likely origin of various complexities
- tonal morphemes/grammatical tones have different sources and different pathways of evolution from lexical tones

A synthesis


Phonetics
❖ phonetic correlates
❖ phonetic variation (predictability ~ allotones, etc.)
Sociolinguistics
❖ multilingualism
❖ tones as identity markers
❖ word play/creativity
Phonology
❖ tones (tonal primitives)
❖ TBU
❖ distributional properties (culminativity, privativity, sandhi, etc.)
Diachrony
❖ reconstruction and proto-tones
❖ correspondences and pathways
❖ sources
Lexicon
❖ contrasts
❖ domains/melodies
❖ word class sensitivity
Grammar and Function:
❖ sole or co-exponent of grammatical categories
❖ as a part of inflectional class systems
❖ tonal processes sensitive to morphosyntax

Conclusions and outlook

- tone evades easy classification both into coarse-grained types and into more fine-grained, abstract, codable traits
- tones forces us see to see linguistic systems as interconnected
- diachrony is an essential component for explanation

- tone is not the problem – it just shows us where we need to go

classification into broad, language-level types

multivariate/ distributional typology

family-level comparison & microtypology

comparison of evolutionary processes

Conclusions and outlook

- collaboration with fieldworkers & language experts
- corpora, naturalistic speech
- towards a true historicization, focusing not on synchronic distributions of traits but on the evolution of systems

EVOTONE
PI: James Kirby
https://evotone.github.io/
origins, acquisition, evolution of tone

Qualitative and quantitative approaches to tone
(Auderset 2024. L Dyn & Change 14 (10))

Theory of tone
PI: Valentin Vydrin
https://thot.huma-num.fr/
role of tone in phon. systems

Integration of tone into constituency typology
(Tallman et al. 2024. LangSciP)

classification into broad, language-level types

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comparison of evolutionary processes

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for insightful discussions on this topic.

"I never met a tone I didn't like."
(Hyman 2018)