



Locality and linguistic theory: The crucial role of African tone languages

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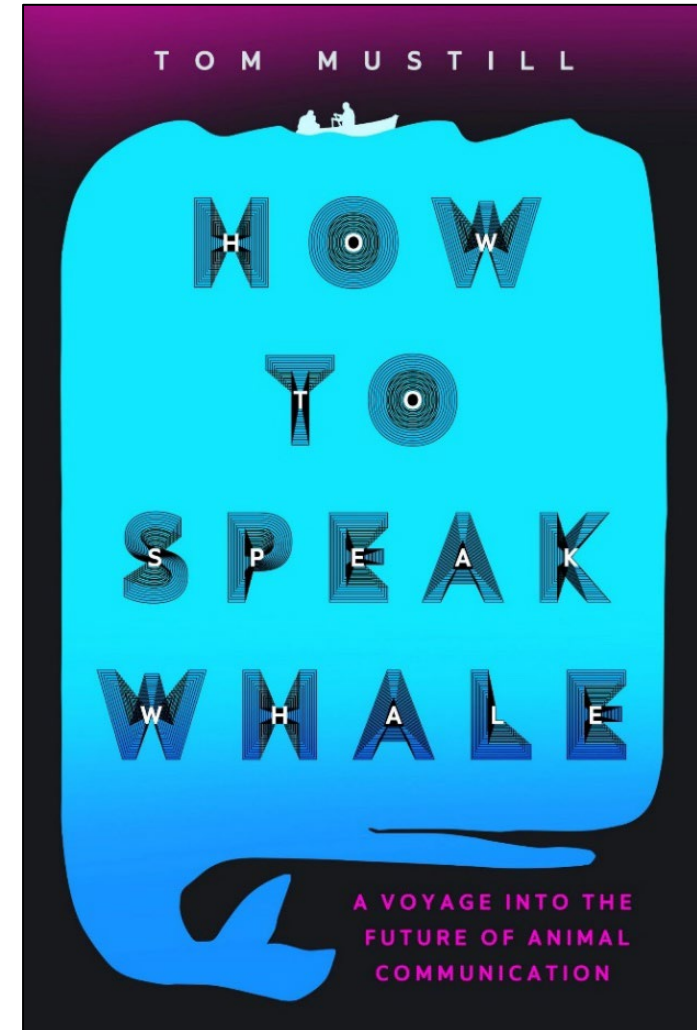


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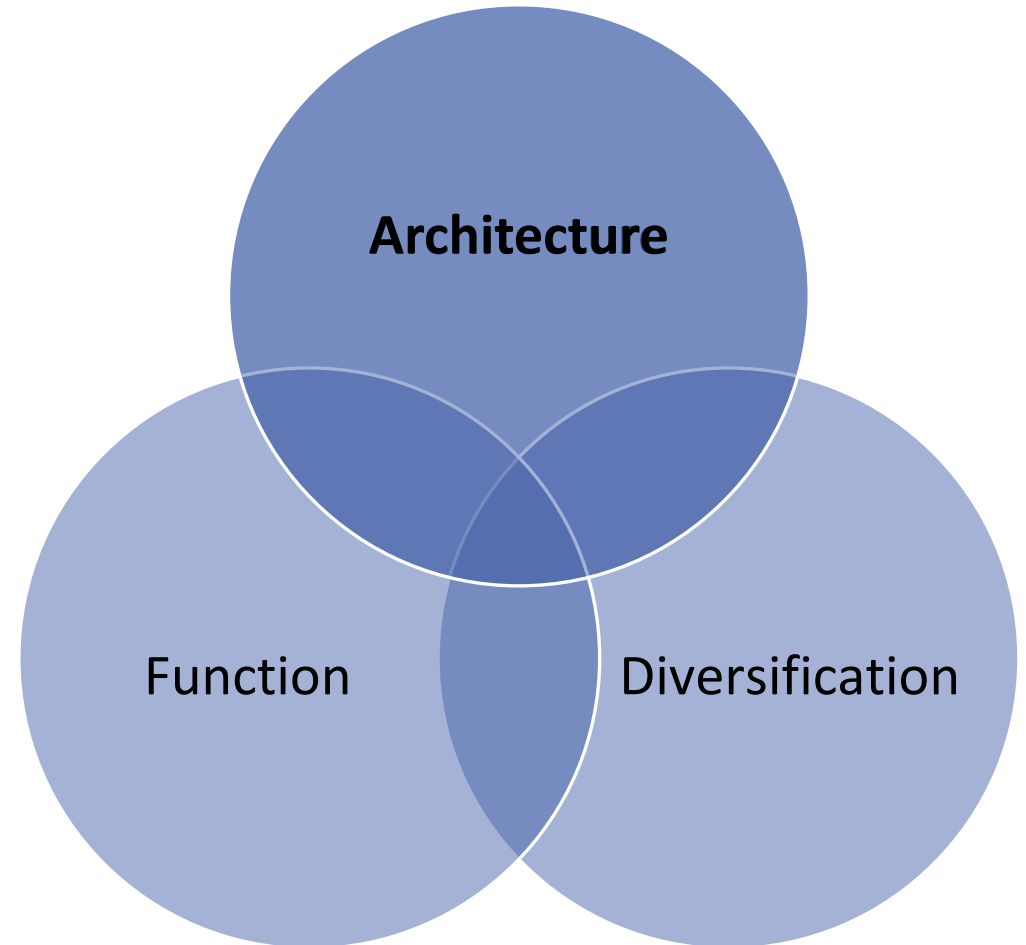
What makes human language HUMAN?

- **Received wisdom:** Capacity for language is unique to our species
- **Closing the species gap:** At this time, however, the communication practices of other species are becoming less exotic
- **Linguistics as a whetstone:** Linguistics is in a unique position for stating sharply and precisely which properties human languages share and which they lack



What makes human language HUMAN?

- **Architecture:** How is language structured?
- **Function:** How is language used?
- **Diversification:** How does language change over space and time?



Architectural property: LOCALITY

- **Locality**: Consider a string (**a b c d e**)
 - In many components of linguistic architecture: **Strictly local interactions**
 - Essentially only between adjacent elements (e.g. **a & b**, or **c & d**, etc.)
- **Today**: Cases of non-local **long-distance interactions**
- Case study 1 – **Direct** long-distance effect:
 - **Allomorphy** selection, i.e. (**a b c d e**) → (**a b c d e**)
- Case study 2 – **Indirect** long-distance effect:
 - Unbounded modification, i.e. (**a b c d e**) → (**a b' c' d' e'**)

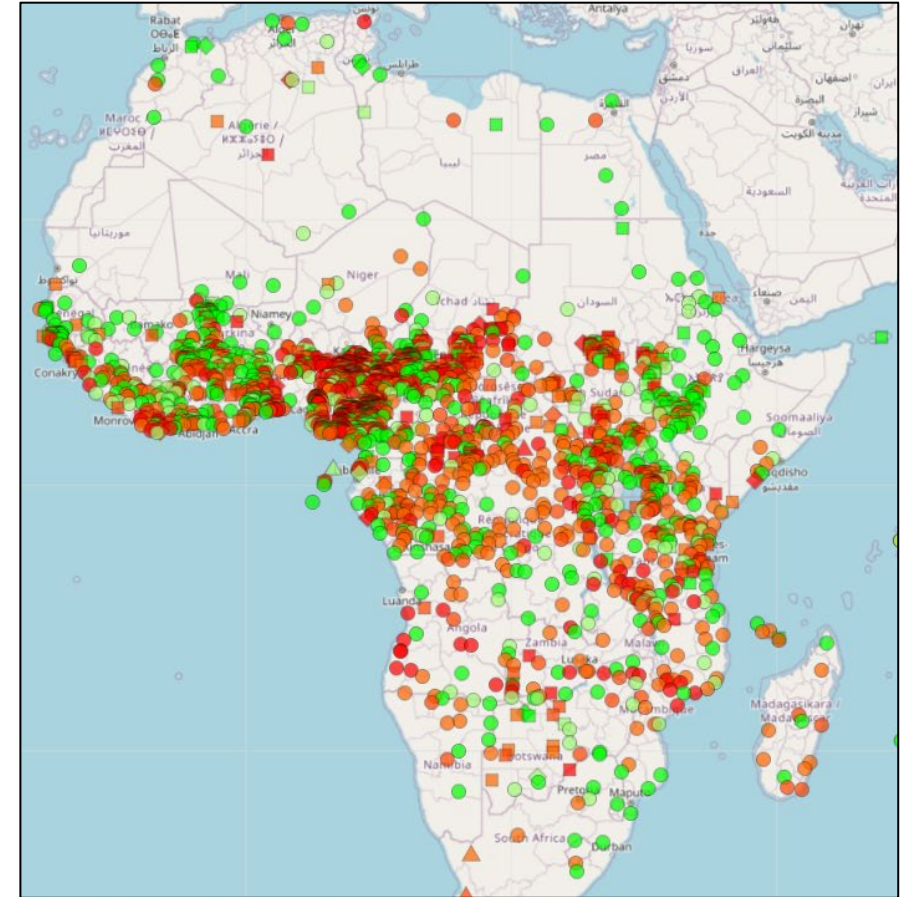
Architectural property: LOCALITY

- **Evidence:**

- Linguistic tone, i.e. the use of pitch (high vs. low) to indicate distinct lexical and grammatical meanings
- Drawing from African tone languages

- **Tone as special:**

- Tone shows **looser locality restrictions**, and thus indispensable for theories of universal linguistic architecture



Roadmap

- **Part I: The theoretical backdrop** – The interface of syntax, morphology, and phonology
- **Part II: The empirical backdrop** – Tone systems in Sub-Saharan Africa
- **Part III: Tone meets theory** – Two case studies of long-distance effects
- **Part IV: Summary and discussion**

Part I: The theoretical backdrop

How do syntax, morphology, and phonology fit together in a unified model of linguistic architecture?

An intuitive idea: Collective bundles

- *She was talking.*

*Syntactic
features*



“she”
/ʃi/
[pron.3.sg.fem]

“was”
/wʌz/
[BE.past.3.sg]

“talk”
/tʌk/
[√TALK]

“-ing”
/-ɪŋ/
[prog]

*Phono-
logical
features*



An intuitive idea: Collective bundles

- *She was talking.*

WARNING!
Simplified tree

Syntactic structure



SUBJECT

TENSE

VERB

ASPECT

*Phono-
logical
features*

Syntactic features



"she"

/ʃi/

[pron.3.sg.fem]

"was"

/wʌz/

[BE.past.3.sg]

"talk"

/tʌk/

[√TALK]

"-ing"

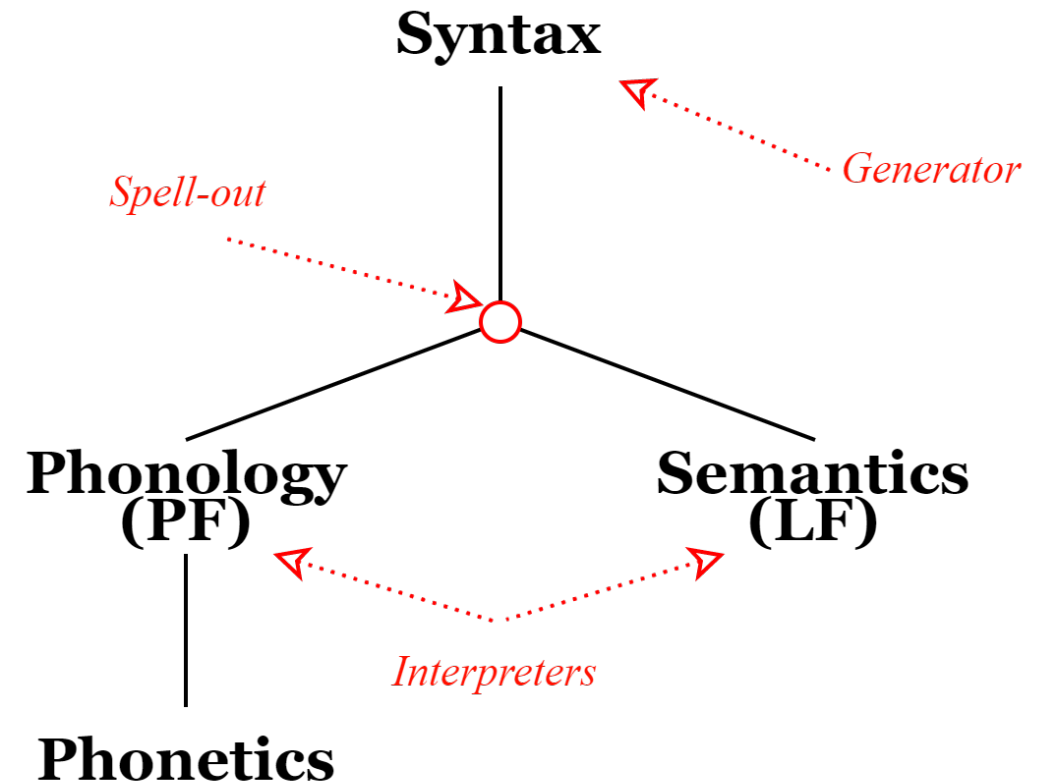
/-ɪŋ/

[prog]

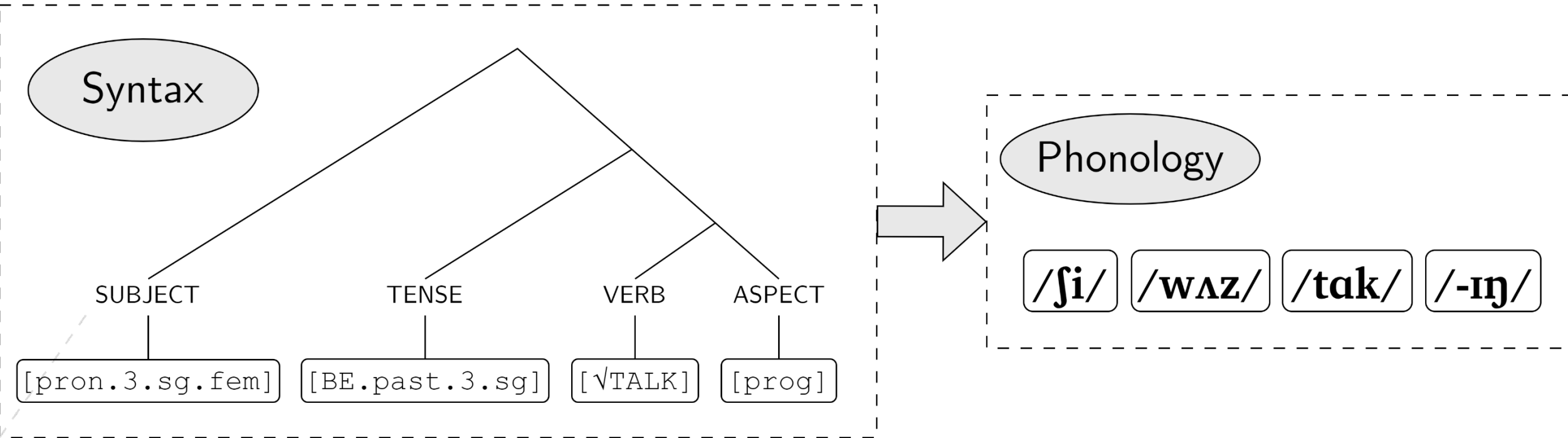


Modular architecture

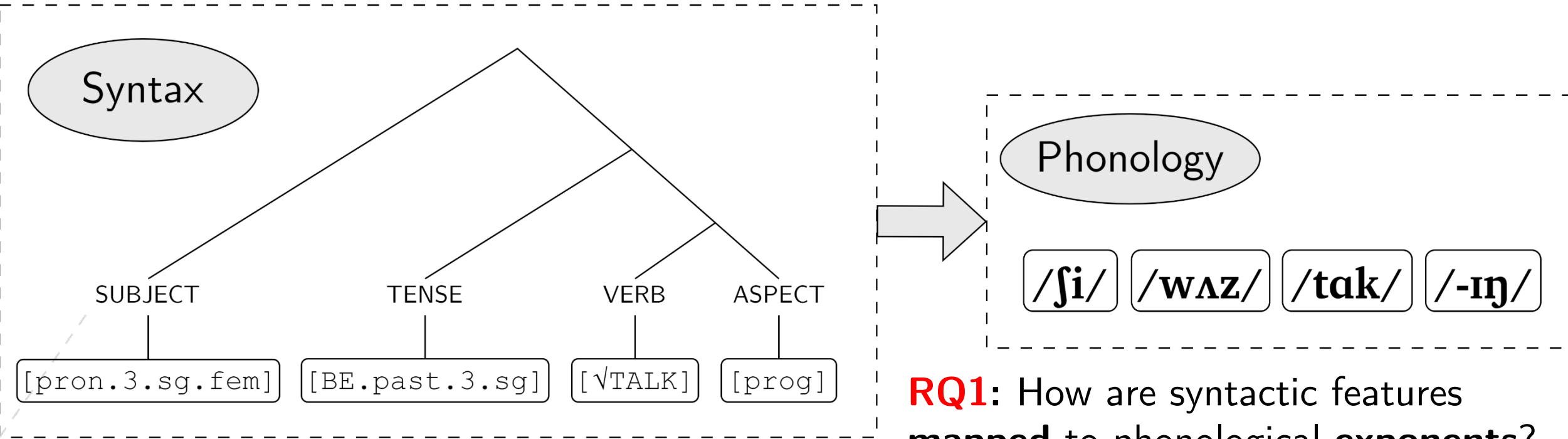
- In contrast: **Modular theories** of linguistic architecture
 - E.g. the **Y-model** (at right)
- Each **module** has its own **alphabet** (i.e. non-decomposable primitives) and **rules** for structure-building/structure-changing



Modular architecture

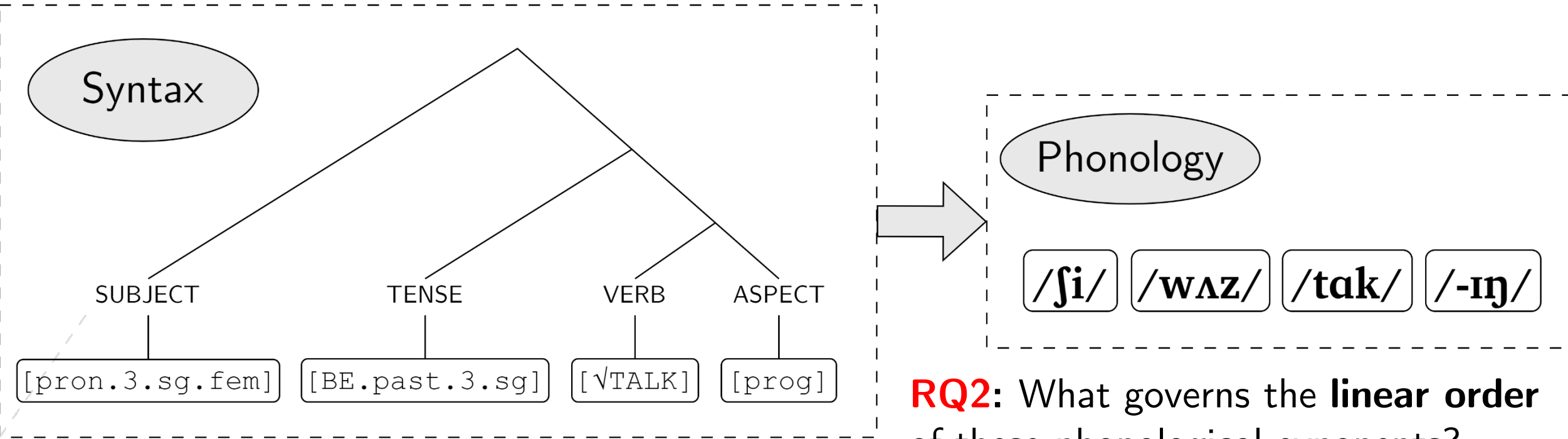


RQ1: Translation and mapping



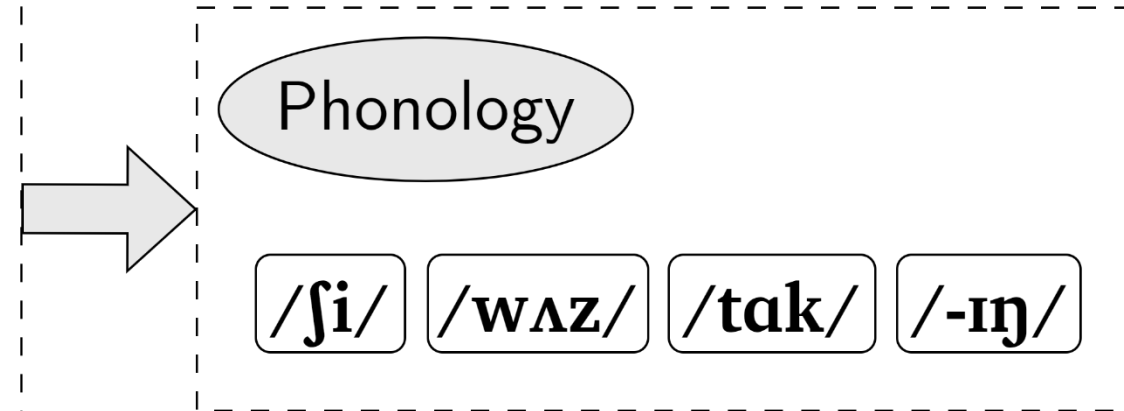
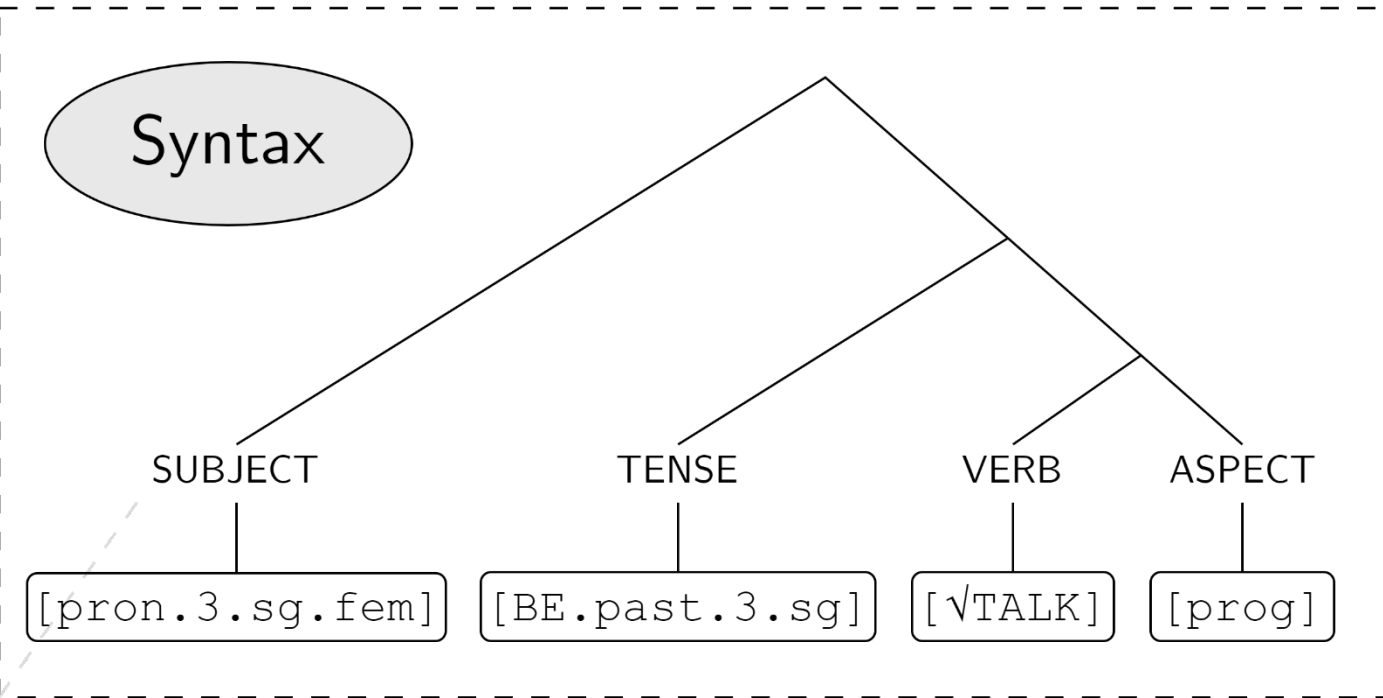
RQ1: How are syntactic features **mapped** to phonological **exponents**?
What restrictions are there? ← E.g. why *she was* and not **her were*?

RQ2: Precedence and order



RQ2: What governs the **linear order** of these phonological exponents? What restrictions are there? ← E.g. why *talk-ing* and not **ing-talk*?

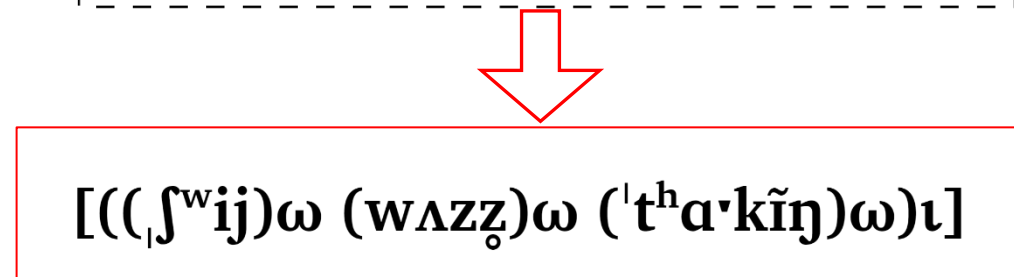
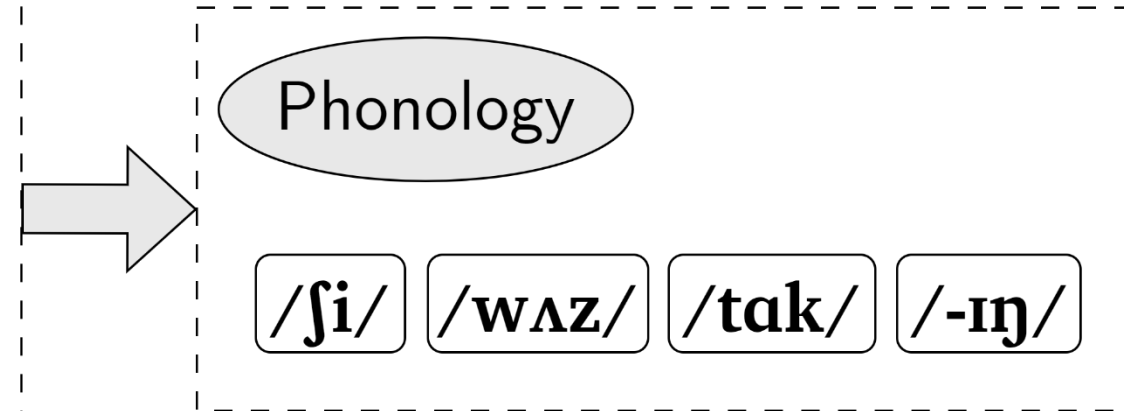
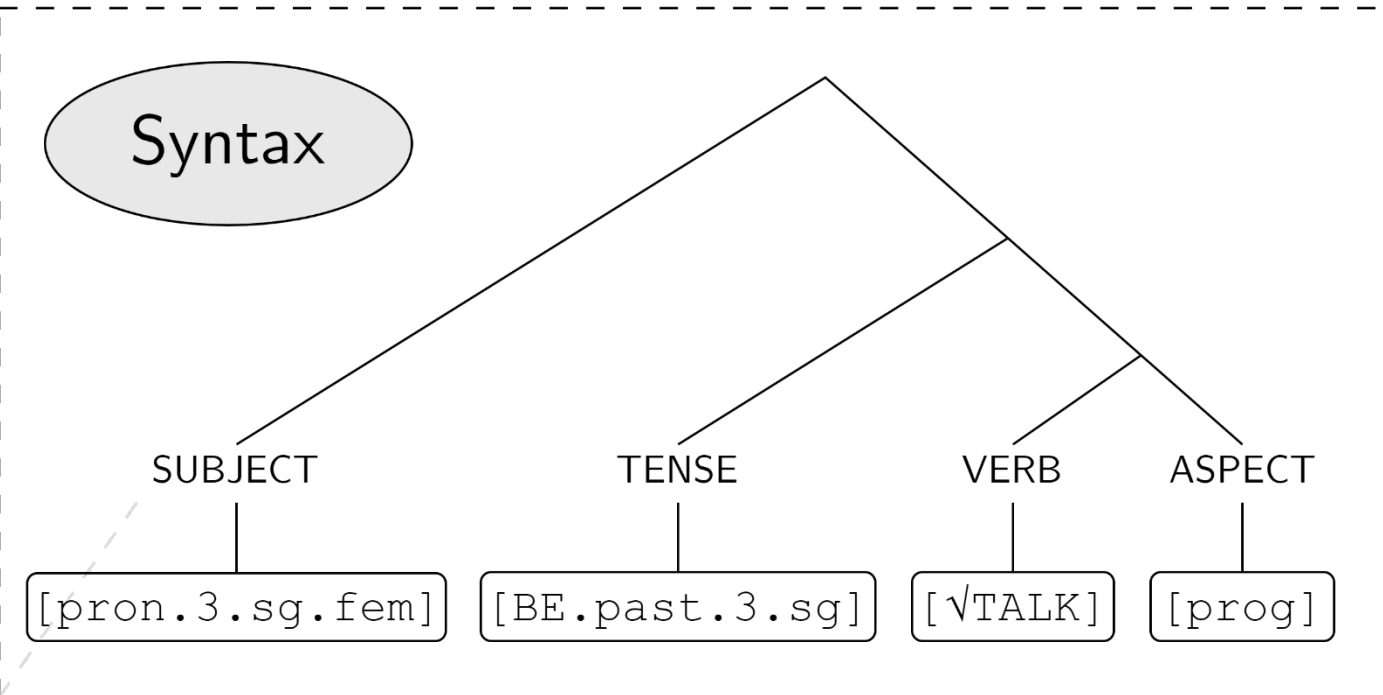
RQ3: Grouping and constituency



RQ3: What kinds of **constituents** do the exponents form? What restrictions are there? ← E.g. why (*was*) (*talk-ing*), not **(was-talk) (ing)* ?

RQ4: Phonology-internal

RQ4: Within phonology itself, which kinds of **phonological processes** are possible? What restrictions are imposed on these processes from syntax?



Part II: The empirical backdrop

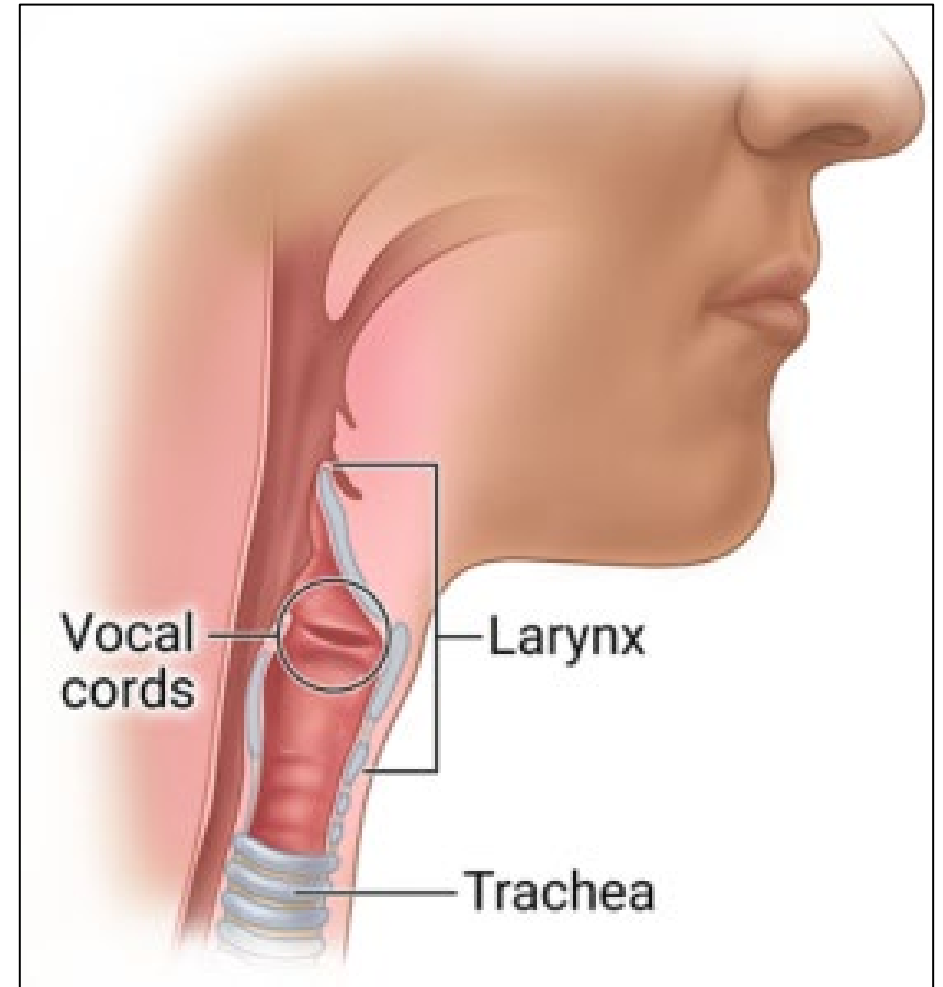
The rich world of pitch and tone in sub-Saharan Africa

The Story of Pitch

- Our primary vehicle for communication:
 - **Segments (consonants and vowels)**
- Writing systems the world over are grounded by their underlying segmental systems
 - Latin (alphabet): ka ki ku ke ko
 - Tamil (abugida): கா கி கு கெ கொ
 - Japanese (syllabary): か き く け こ

The Story of Pitch

- A less storied protagonist of spoken communication: **Pitch**
 - “the **rate of vibration** of the **vocal cords** during voice production”
 - **Lower pitch**: slower and less stretched vocal cords (a.k.a. vocal folds)
 - **Higher pitch**: faster and more stretched vocal cords



The Story of Pitch

- The linguistically structured manipulation of pitch is a **true linguistic universal**
- Two broad types: **non-tonal languages** vs. **tone languages**
- Non-tonal languages prototypically use pitch for **emphasis** (types of focus and topic), and to indicate **sentence-level** meaning (e.g. statements vs. questions)
- **Intonation in English**
 - *Anna* (question) vs. *Anna* (answer) vs. *Anna* (calling) vs. *Anna* (continuation) vs. ...

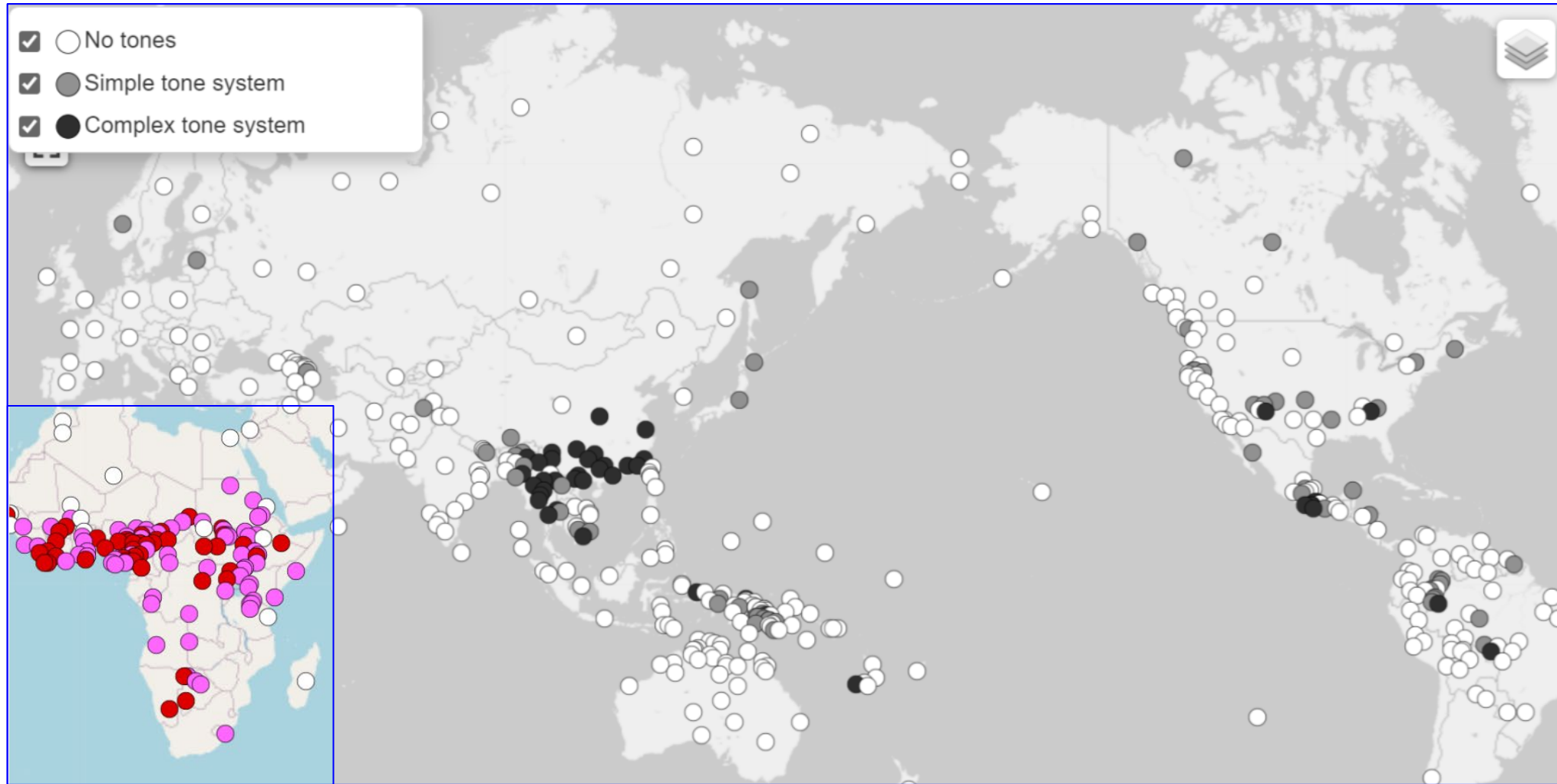
The Story of TONE

- In contrast, approximately half the world's languages are **tone languages**, which use pitch to distinguish individual words and morphemes
- **Pitch**: Measurable and independent of grammar
 - Phonetic, physiological, acoustic, gradient
- **Tone**: An instantiation of pitch within grammar
 - Phonological, meaningful, relative, categorical

The Story of TONE

- Perhaps the most famous example is **Mandarin Chinese**
- Tone contrasts with identical syllable **ma**
 - High [5] **mā** 'mother'
 - Mid-Rise [35] **má** 'hemp'
 - Dip-Rise [214] **mǎ** 'horse'
 - Sharp fall [51] **mà** 'scold'

The Story of TONE

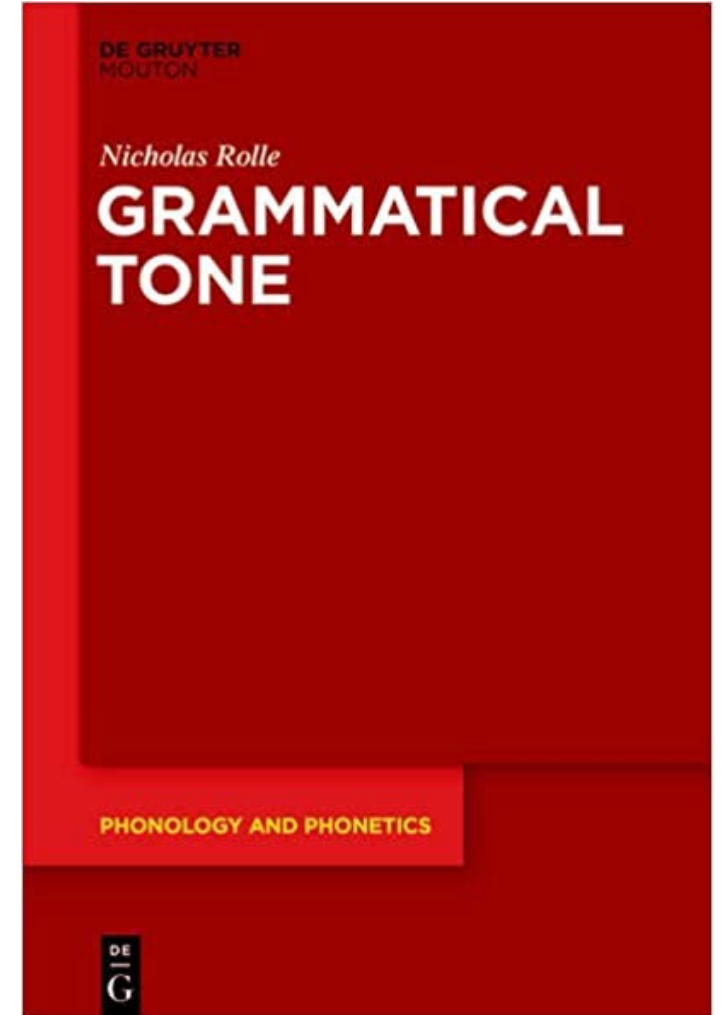


The Story of TONE

- Cilungu lexical tone
 - H **kál-** ‘cut skin’
 - L **kàl-** ‘buy’
 - H **lúk-** ‘vomit’
 - L **lùk-** ‘weave’
 - H **súl-** ‘forge’
 - L **sùl-** ‘break wind’
 - H **léng-** ‘beg’
 - L **lèng-** ‘draw’
 - H **ómb-** ‘work’
 - L **òmb-** ‘get wet’ *etc.*
- Cilungu grammatical tone with verb **sukilil-** ‘accompany’
 - ‘and then they **started to** accompany’
H-H-**HHH**-L [yá-á-**súkílíl**-à]
 - ‘they **have just** accompanied’
H-H-**HLL**-H [yá-á-**súkìlìl**-á]
 - ‘they **have already** accompanied’
H-H-**LHH**-H [yá-á-**sùkílíl**-á]
 - ‘**let** them start accompanying’
H-L-**LLL**-L [yá-à-**sùkìlìl**-à]

A personal journey through tone

- Virtually **all** African tone languages exhibit some grammatical tone (**Hyman, Sande, Lionnet, Rolle, & Clem 2021**)
- **Rolle (*to appear* [2025])**: First dedicated book on grammatical tone



A personal journey through tone

Wamey (Rolle & Merrill 2023)

Limba (Rolle, Hyman, Mansaray, & Kamara *in prep.*)

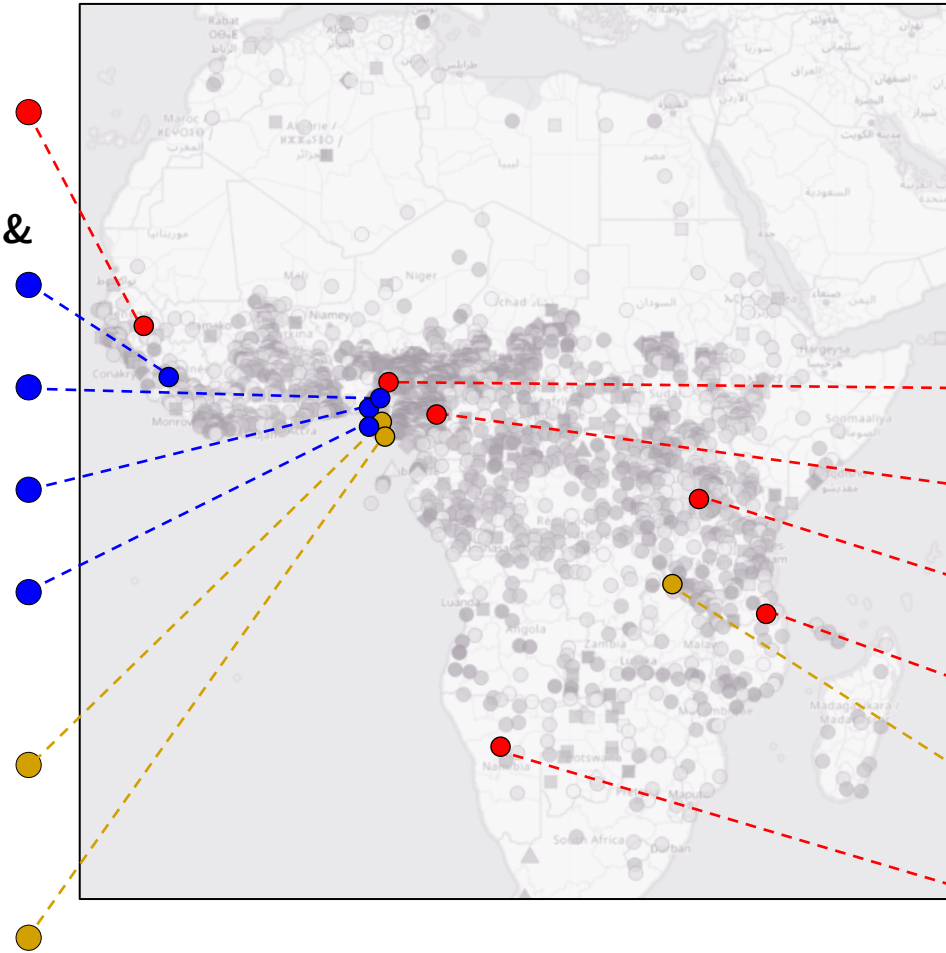
Esan (Rolle 2010, 2012, *in prep.*)

Urhobo (Rolle 2013)

Izon (Rolle 2018, 2021)

Degema (Rolle & Kari 2016, Rolle 2020, Rolle & Kari 2022)

Kalabari (Rolle & Harry 2024 *[forthcoming]*)



Blue = my original fieldwork

Orange = collaboration with language specialists

Red = using existing materials

● **Ebira** (Rolle 2022)

● **Ghomala'** (Rolle 2024 *[forthcoming]*)

● **Kuria** (Rolle & Lionnet 2020)

● **Makonde** (Rolle & Hyman 2019)

● **Cilungu** (Rolle & Bickmore 2022)

● **Khoekhoe** (Rolle *in prep.*)

Part III: Tone meets theory

**Two cases studies of long-distance effects in
tone languages**

Case study I: Long-distance morphology involving tone

Allomorphy and locality

- A morpheme may have multiple **allomorphs**
 - Items with the exact **same meaning** but **different forms**
 - Indefinite marker *a* /ə/ (e.g. *a bird*) vs. *an* /ən/ (e.g. *an eagle*)
- What factors **condition** which form gets inserted?
 - Much linguistic theory has shown that **locality relations** play a crucial role in constraining possible allomorphic patterns

Allomorphy and locality


- [d] [f] [tʃ] [k]
A { dog, fish, cheetah, crazed elephant, ... }
- [æ] [ɛ] [aʊ] [ɪ]
An { axe, elephant, hour, illustrious fish, ... }

- * [g] [ʃ] [s]
A { dog, fish, affixx, ... }
- * [ə] [o] [i]
An { cheetahh, mango, doggy, ... }


Enter Cilungu

- African tone languages show just such a case, involving **non-local tonal allomorphy**
- Enter Cilungu [mgr] – Bantu language, Zambia and Tanzania (Bantu Zone M14)
- Analysis is from **Rolle & Bickmore (2022)**

Morphology
<https://doi.org/10.1007/s11525-022-09391-3>

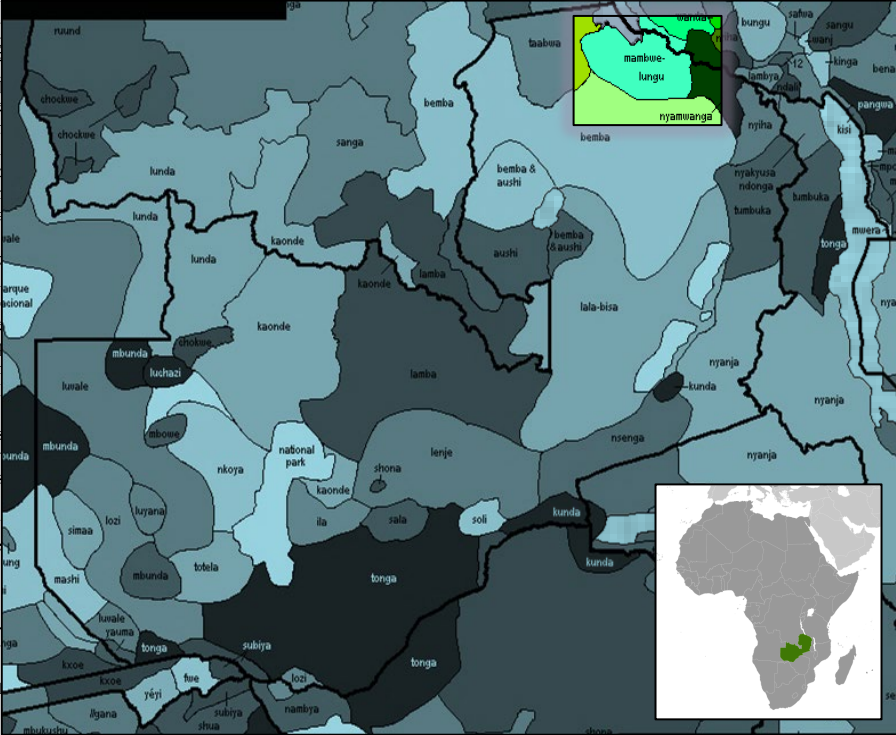


Outward-sensitive phonologically-conditioned suppletive allomorphy vs. first-last tone harmony in Cilungu

Nicholas Rolle^{1,2}  · Lee Bickmore³

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Abstract
We present a case study of grammatical tone allomorphy in Cilungu (Bantu). Tense/Aspect/Mood designations (TAMs) are realized via co-exponence of prefixes, suffixes, and floating tones. In a minority of TAMs, there is allomorphy with the floating tone target (⊕) on the subject marker. In contrast, a harmonic tone is realized on the final syllable of the verb stem. This is the first time that a harmonic tone is reported in a Bantu language. The analysis shows that the floating tone is tonally conditioned by the subject marker, while the harmonic tone is tonally conditioned by the verb stem. The analysis also shows that the floating tone is tonally conditioned by the subject marker, while the harmonic tone is tonally conditioned by the verb stem.



Key
dire

Ext

Pub

Cilungu tonal inflection

- Cilungu grammatical tone with verb **sukilil** ‘accompany’
 - Past inceptive: ‘and then they **started to** accompany’
 - H-H-**HHH**-L [yá-á-**súkílíl**-à]
 - Recent perfect: ‘they **have just** accompanied’
 - H-H-**HLL**-H [yá-á-**súkìlìl**-á]
 - Remote perfect: ‘they **have already** accompanied’
 - H-H-**LHH**-H [yá-á-**sùkílíl**-á]
 - Hortative: ‘**let** them start accompanying’
 - H-L-**LLL**-L [yá-à-**sùkìlìl**-à]

Cilungu tonal inflection

- Tense/Aspect/Mood (TAM) inflection

Remote Perfect TAM: [yá-á-sùkílíl-á] 'they have already accompanied'

Cilungu tonal inflection

- Tense/Aspect/Mood (TAM) inflection

	yá-			sukilil					
[]
[_{VERB}	AGR-			ROOT]
	they			accompany					
Remote Perfect TAM: [yá-á-sùkílíl-á] 'they have already accompanied'									

Cilungu tonal inflection

- **Tense/Aspect/Mood (TAM) inflection**
 - **1** - Prefixes before the root, but after AGREEMENT (AGR)

		1						
[	yá-	a-		sukilil]
[_{VERB}	AGR-	TAM-		ROOT]
	they	already		accompany				
Remote Perfect TAM: [yá-á-sùkílíl-á] 'they have already accompanied'								

Cilungu tonal inflection

- **Tense/Aspect/Mood (TAM) inflection**
 - **1** - Prefixes before the root, but after AGREEMENT (AGR)
 - **2** - Suffixes after the root

		1			2		
[	yá-	a-		sukilil	-a]
[_{VERB}	AGR-	TAM-		ROOT	-TAM]
	they	already		accompany	already		
Remote Perfect TAM: [yá-á-sùkílíl-á] 'they have already accompanied'							

Cilungu tonal inflection

- **Tense/Aspect/Mood (TAM) inflection**
 - **1** - Prefixes before the root, but after AGREEMENT (AGR)
 - **2** - Suffixes after the root
 - **3** - Grammatical tone (GT) targeting a position in the STEM

		1			2	3		
[	yá-	a-	[	sukilil	-a	Ⓜ ^{2-F}]]
[_{VERB}	AGR-	TAM-	[_{STEM}	ROOT	-TAM	GT]]
	they	already		accompany	already	already		
Remote Perfect TAM: [yá-á-sùkílíl-á] 'they have already accompanied'								

Cilungu tonal inflection

- All inflections have **1 of 4 Grammatical Tone ‘melodies’**

GT-0	∅	No grammatical tone	... V [STEM V V V V]
GT-1	Ⓜ ^F	High on final vowel of stem	... V [STEM V V V Ṽ]
GT-2	Ⓜ ²	High on 2nd vowel of stem	... V [STEM V Ṽ V V]
GT-3	Ⓜ ^{2-F}	High from 2nd to final vowel	... V [STEM V Ṽ Ṽ Ṽ]

- While exotic, think of different GTs like inflectional suffixes
 - GT-0 ∅ ≈ “-a”
 - GT-1 Ⓜ^F ≈ “-e”
 - GT-2 Ⓜ² ≈ “-i”
 - GT-3 Ⓜ^{2-F} ≈ “-o”

GT allomorphy

- Most TAM inflections show consistent GT in all contexts...
 - i.e. **no allomorphy**

	TAM name	Prefixes	...	Suffixes	GT
No GT allomorphy	<i>Past Inceptive</i>	[Ⓜ] aa-	...	-a	∅
	<i>Contrastive Habitual</i>	ma-áa-	...	-a	∅
	...				
	<i>Potential</i>	∅ ngá-	...	-a	Ⓜ ^F
	<i>Far Past</i>	a-	...	-il -e	Ⓜ ^{2-F}
	<i>Far Past Progressive</i>	a-	...	-ang -a	Ⓜ ^{2-F}
...					

GT allomorphy

- ...but a small number show **contextual GT allomorphy**
 - Comparable to the *a/an* allomorphy of English

	TAM name	Prefixes	...	Suffixes	GT
No GT allomorphy	<i>Past Inceptive</i>	[Ⓜ] aa-	...	-a	∅
	<i>Contrastive Habitual</i>	ma-áa-	...	-a	∅
	...				
	<i>Potential</i>	∅ ngá-	...	-a	Ⓜ ^F
	<i>Far Past</i>	a-	...	-il -e	Ⓜ ^{2-F}
	<i>Far Past Progressive</i>	a-	...	-ang -a	Ⓜ ^{2-F}
GT allomorphy	<i>Perfect</i>			-il -e	Ⓜ ^{2-F} / Ⓜ ²
	<i>Yesterday Past</i>	á-	...	-il -e	Ⓜ ^F / ∅
	<i>Recent Past</i>	á-cí-	...	-il -e	Ⓜ ^F / Ⓜ ²

GT allomorphy exemplified

- Recent past ‘__-ed recently’: **á-** + **cí-** + **-il** + **-e** + $\textcircled{\text{H}}^{\text{F}}$ / $\textcircled{\text{H}}^2$
(GT-1 / -2)
- High-toned **agreement** markers condition **one GT allomorph**
 - **tú**-á-cí-sópolol-il-e $\textcircled{\text{H}}^{\text{F}}$ → **tú**-á-cí-[sópolol-il-**é**]
 - **AGR**-TAM-recent-untie-TAM-TAM **GT** ‘we recently untied’
- Toneless **agreement** marker condition **another GT allomorph**
 - **u**-á-cí-sópolol-il-e $\textcircled{\text{H}}^2$ → **u**-á-cí-[só**pó**lol-il-e]
 - **AGR**-TAM-recent-untie-TAM-TAM **GT** ‘he/she recently untied’

Non-locality between **trigger** & **target**

- Recent past ‘-ed recently’

- \underline{H} H H H \textcircled{H}^F
| | | | |
tú-á-cí-sópolol-il-**é** ‘we recently untied’

- H H H \textcircled{H}^2
| | | |
u-á-cí-só**pó**lol-il-e ‘he/she recently untied’

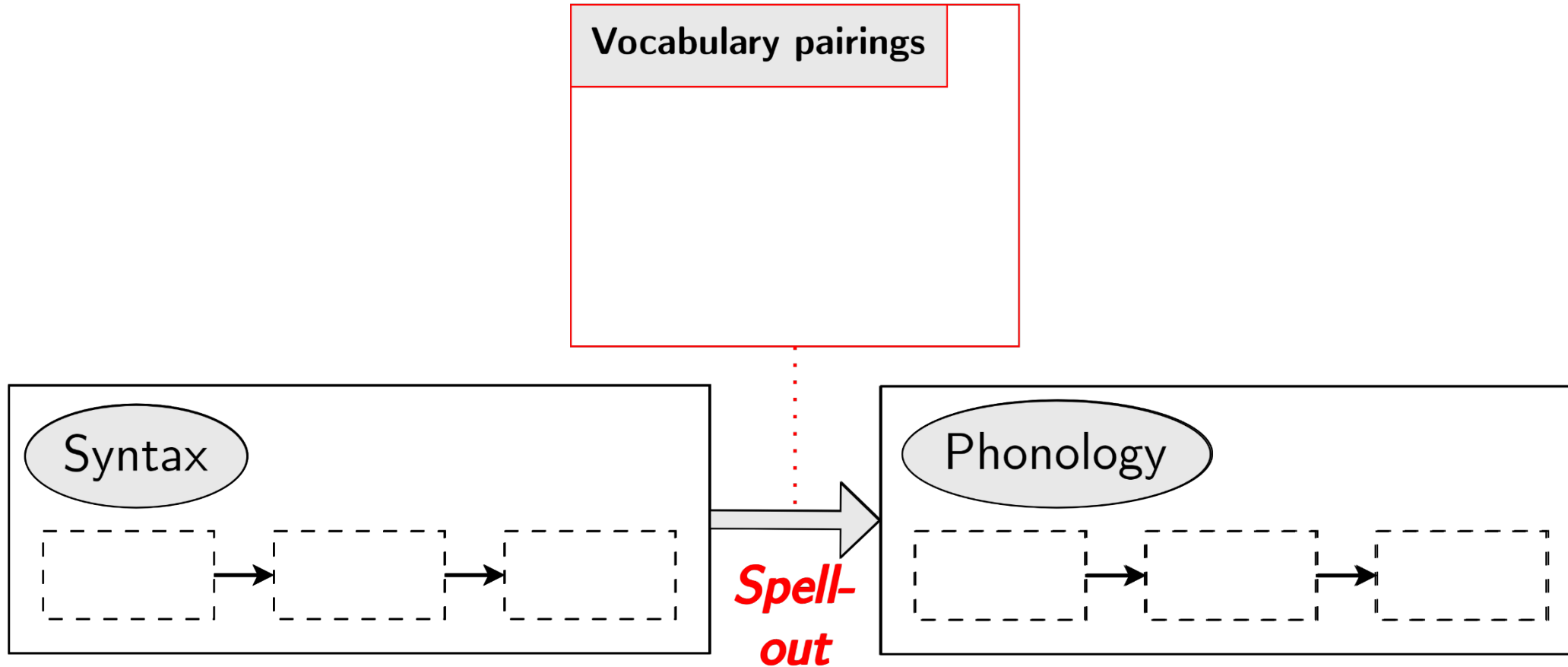
- Non-local when measured in terms of segments **or** tones!

Recall RQ1

- **First Research Question (RQ1):**
 - How are syntactic bundles mapped to phonological **exponents**?
And what restrictions are there?
 - E.g. in *she was talking*, why *she was* and not **her were* ?
- Current morphological theory (e.g. Embick 2015)
 - **Vocabulary Pairings (or Vocabulary Items):** “phonological exponents ... are paired with conditions on insertion, stated in terms of [syntactic] features.”

Allomorphy and vocabulary pairings

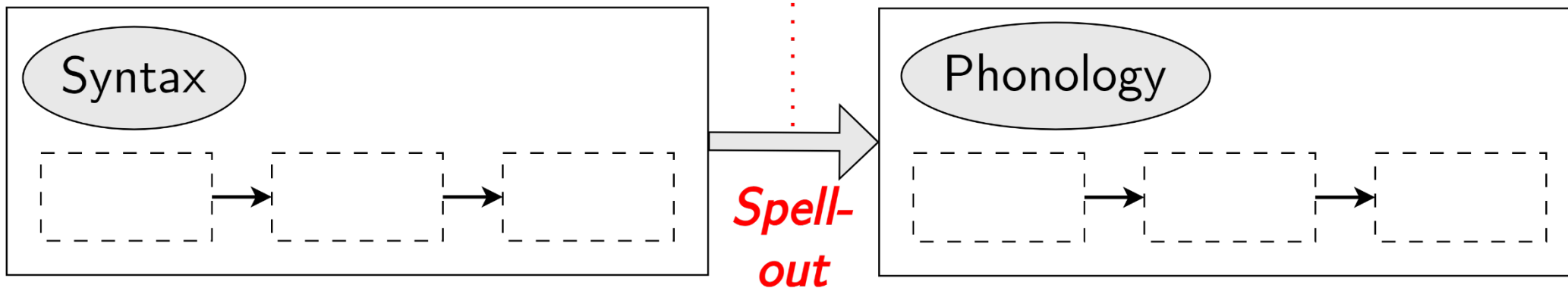
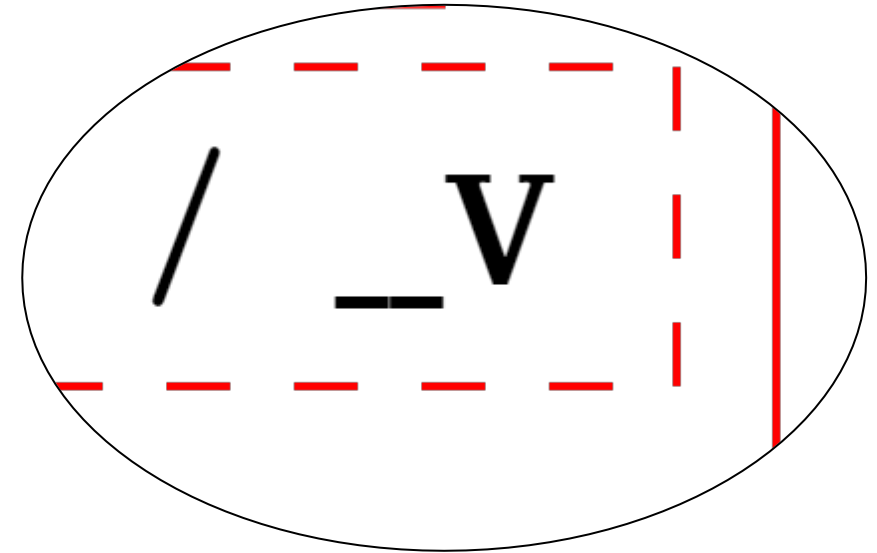
- English indefinite *a/an* , again



Allomorphy and vocabulary pairings

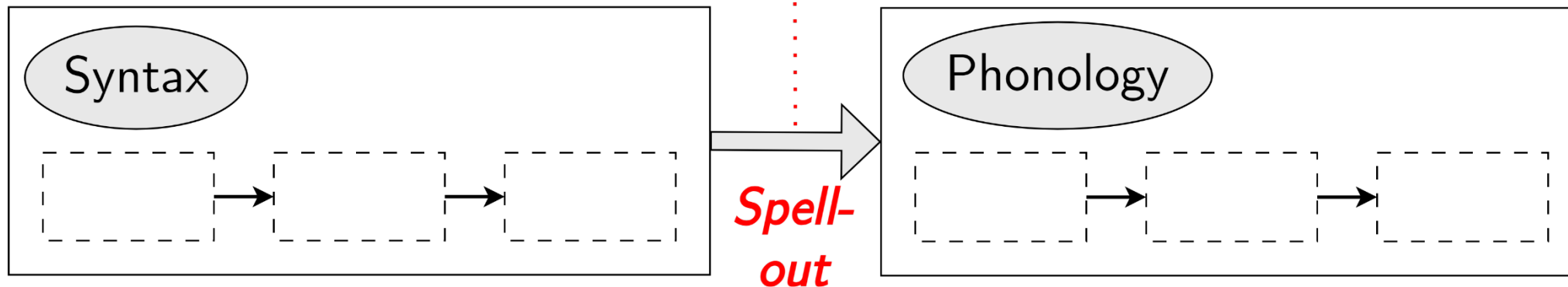
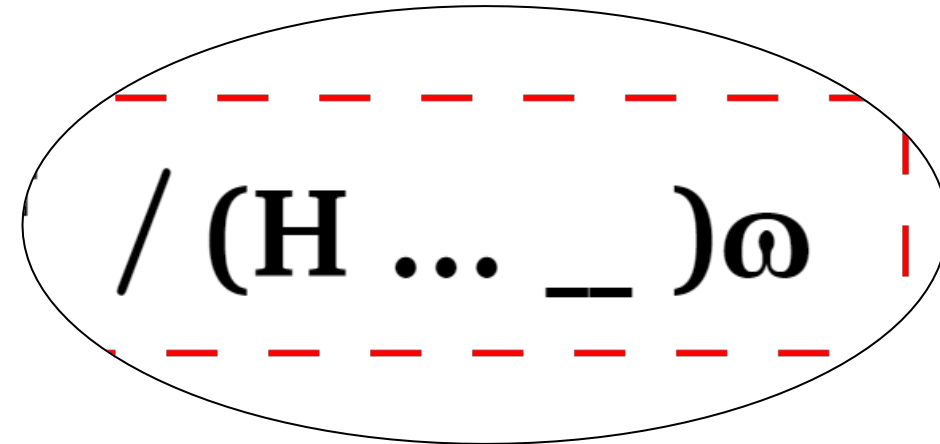
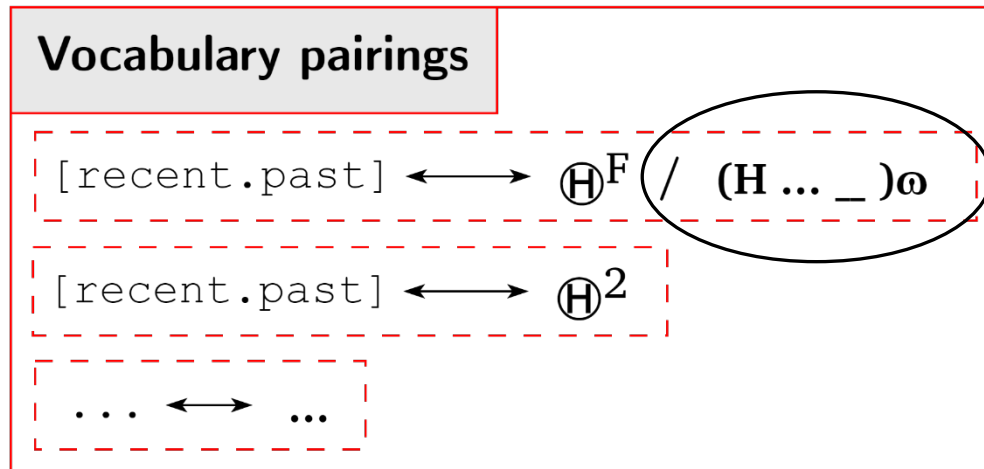
- English indefinite *a/an*, again

Vocabulary pairings	
[indef] ↔ ən	/ _v
[indef] ↔ ə	
... ↔ ...	



Allomorphy and vocabulary pairings

- Recent past ‘_ -ed recently’: **á-** + **cí-** + **-il** + **-e** + $\textcircled{\text{H}}^{\text{F}}$ / $\textcircled{\text{H}}^2$



Case study I: Interim summary

- This first case study involved **long-distance allomorphy**
- Cases of allomorphy typically involve **strict adjacency** between target and trigger (e.g. *a/an* conditioned by adjacent segment)
- However, my research shows evidence from an African tone language **Cilungu** that this is **too restrictive** as a universal principle
- In Cilungu, tone value at **beginning** of word (the **trigger**) may dictate grammatical tone allomorph at **end** of word (the **target**)
- Allomorphy is still **restricted** to the **word-domain** ()^o
- **Implication for linguistic theory:** Locality domains still exist, but are not necessarily based on strict adjacency (e.g. here, word-based)

Case study II: Long-distance phonology involving tone

Long-distance phonology

- Hungarian Front/Back Vowel Harmony
 - A partial paradigm of the **present conditional**

	1PL 'we'	2PL 'you'	3PL 'they'
<i>vár</i>	<i>várnánk</i>	<i>várnátok</i>	<i>várnának</i>
/va:r/	[va:r-na:-ŋk]	[va:r-na:-tok]	[va:r-na:-nək]
'wait, expect'	'we would expect'	'you would expect'	'they would expect'
<i>tör</i>	<i>törnénk</i>	<i>törnétek</i>	<i>törnének</i>
/tø:r/	[tø:r-ne:-ŋk]	[tø:r-ne:-tək]	[tø:r-ne:-nək]
'break'	'we would break (s/t)'	'you would break (s/t)'	'they would break (s/t)'

Long-distance phonology

- Hungarian Front/Back Vowel Harmony
 - A partial paradigm of the **present conditional**

	1PL 'we'	2PL 'you'	3PL 'they'
<i>vár</i>	<i>várnánk</i>	<i>várnátok</i>	<i>várnának</i>
/v ^a r/	[v ^a :r-n ^a :ŋk]	[v ^a :r-n ^a :t ^o k]	[v ^a :r-n ^a :n ^ə k]
'wait, expect'	'we would expect'	'you would expect'	'they would expect'
<i>tör</i>	<i>törnénk</i>	<i>törnétek</i>	<i>törnének</i>
/t ^ø r/	[t ^ø r-ne:ŋk]	[t ^ø r-ne:t ^ɛ k]	[t ^ø r-ne:n ^ɛ k]
'break'	'we would break (s/t)'	'you would break (s/t)'	'they would break (s/t)'

Long-distance phonology

- Hungarian Front/Back Vowel Harmony: **Word-bound**
 - *tőlük még várának néhány megnyugtató mondatot és gesztust a jövőben arról*
 - “**they would** still **expect** some reassuring words and gestures from them about it in the future”
- [... **v**a:r-**n**a:-**n**ɔk ne:ɦa:ŋ meg-ɲuktɔto: monɔtɔt e:ʃ ɡeʃtuʃt ɔ jøvø:βen ɔr:o:l]

Long-distance phonology

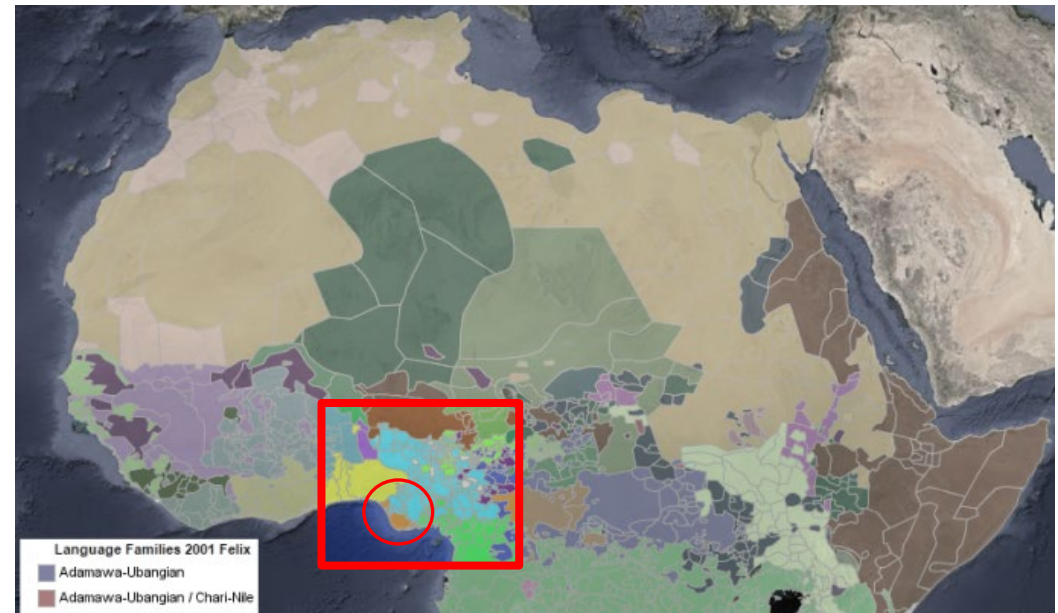
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- [... va:r-na:-nək ne:ħa:ŋ meŋ-ɲuktɔ: monɔtot e:ʃ
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- * [... va:r-na:-nək na:ħa:ŋ mɛŋ-ɲuktɔ: monɔtot a:ʃ
gɔstʉft ɔ jovo:bɔn ɔr:o:l]

Long-distance tonology: Even longer

- Unlike vowels, exactly such sentence-level effects are **found for tone**
- Consider the Orungu dialect of Myeni (spoken in Gabon)
- **Local effect:** The imperative – ‘Leave the children alone tonight!’
 - V O Adv Adv
 - rìyà-**(H)** àwáná áŋkà yó ìŋkòlò
 - leave\INFL -**GT** children alone tonight
 - → [rìy àwán áŋkà yó ìŋkólò]
- **Long-distance:** Neg. imp. – ‘Do not leave the children alone tonight!’
 - V O Adv Adv
 - à-**(H)**-rìyà àwáná áŋkà yó ìŋkòlò
 - NEG-**GT**-leave\INFL children alone tonight
 - → [à-ríy áwán áŋká yó ìŋkóló]

Fieldwork on Ijoid

- **Ijoid language family** of southern **Nigeria**
 - Often referred to simply as “Ijaw”/“Ijo”
- Located throughout the mangroves of the rich **Niger Delta region**
- **Isolate family**: Not demonstrably related to any other language family



Fieldwork on Ijoid

- Collaboration on **Kalabari language** [i.j.n] with Prof. Otelemate Harry (The University of the West Indies, Mona, Jamaica)
 - **Rolle & Harry forthcoming [2024]**
- Original fieldwork on **Izon language** [i.j.c] (Gbarain dialect), collaborating with Mr. Jumbo Gift (University of Port Harcourt)
 - **Rolle 2018, Rolle 2021**
- Despite large speaker populations (500,000 to 1,000,000 each), the languages are **definitely endangered** due to a shift to Nigerian Pidgin English and Standard English



Dominant vs. non-dominant tone

- Data from Kalabari

(1) Dominant: $\textcircled{\text{L}}\textcircled{\text{H}}$ 'this'

(2) Non-dominant: $\textcircled{\text{H}}\textcircled{\text{L}}$ IMPERATIVE

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(2) Non-dominant: $\textcircled{\text{H}}\textcircled{\text{L}}$ IMPERATIVE

HH **námá** 'meat'

LL **pùlò** 'oil'

HL **bélè** 'light'

LH **gàrí** 'garri'

H⁺H **ḅá⁺rá** 'hand'

kúró 'fall'

lègì 'sit'

ḅámà 'punish'

ḅùkó 'tell'

ḅ⁺lḅ 'hold'

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HH	námá 'meat' → mí nàmá 'this meat'	kúró 'fall'
LL	pùlò 'oil' → mí pùló 'this oil'	lègì 'sit'
HL	bélè 'light' → mí bèlé 'this light'	ḃámà 'punish'
LH	gàrí 'garri' → mí gàrí 'this garri'	ḃùkó 'tell'
H[↓]H	ḃá[↓]rá 'hand' → mí ḃàrá 'this hand'	ḃ[↓]lḃ 'hold'

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Replacive/Neutralizing
(Can show long-distance effects)

HH	námá 'meat' → mí nàmá 'this meat'	kúró 'fall'
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LL	pùlò 'oil' → mí pùló 'this oil'	lègì 'sit' → lègî 'sit!'
HL	bélè 'light' → mí bèlé 'this light'	ḃámà 'punish' → ḃá[↓]mâ 'punish!'
LH	gàrí 'garri' → mí gàrí 'this garri'	ḃùkó 'tell' → ḃùkô 'tell!'
H [↓] H	ḃá[↓]rá 'hand' → mí ḃàrá 'this hand'	ḃ[↓]ló 'hold' → ḃ[↓]lô 'hold!'

Dominant vs. non-dominant tone

- Data from Kalabari

(1) Dominant: $\textcircled{\text{L}}\textcircled{\text{H}}$ 'this'

Replacive/Neutralizing
(Can show long-distance effects)

(2) Non-dominant: $\textcircled{\text{H}}\textcircled{\text{L}}$ IMPERATIVE

Concatenative/Non-neutralizing
(Show only local effects)

HH **námá** 'meat' → **mí nàmá** 'this meat'

kúró 'fall' → **kúrô** 'fall!'

LL **pùlò** 'oil' → **mí pùló** 'this oil'

lègì 'sit' → **lègî** 'sit!'

HL **bélè** 'light' → **mí bèlé** 'this light'

ḃámà 'punish' → **ḃá[↓]mâ** 'punish!'

LH **gàrí** 'garri' → **mí gàrí** 'this garri'

ḃùkó 'tell' → **ḃùkô** 'tell!'

H[↓]H **ḃá[↓]rà** 'hand' → **mí ḃàrà** 'this hand'

ḃ[↓]ló 'hold' → **ḃ[↓]lô** 'hold!'

Dominant tone long-distance effects

- Izon (Rolle 2021) – Modifer **ìnè**(L)(H) ‘my’ triggers tone replacement
 - **ìnè**(L)(H) **námá** → **ìnè nàmá** ‘my meat’
 - **ìnè**(L)(H) **bùrù** → **ìnè bùrú** ‘my yam’
 - **ìnè**(L)(H) **ínkì** → **ìnè ìnkí** ‘my ink’
 - **ìnè**(L)(H) **ìngǒ** → **ìnè ìngó** ‘my fish trap’
- Target is head noun and **anything between** trigger (i.e. **ìnè** ‘my’) and head noun
 - **ìnè**(L)(H) **gbèèkì** **bùrù** → **ìnè gbèèkì bùrú**
 - my short yam ‘my short yam’
 - **ìnè**(L)(H) **tára** **dìbà** **bùrù** → **ìnè tàrà díbá bùrú**
 - my three big yam ‘my three big yams’
 - **ìnè**(L)(H) **tára** **dìbà** **kúlúkúlú** **bùrù** → **ìnè tàrà díbá kúlúkúlú bùrú**
 - my three big black yam ‘my three big black yams’

Dominant tone long-distance effects

- The A class – Sponsors (L)(H)
 - d̀ìbà(L)(H) n`ámá kùlúkùlú t̀íbí → [d̀ìbà n`ámá kùlúkùlú t̀íbí]
 - big animal black head ‘a big animal’s black head’
- The B class – Sponsors (H)
 - kùlúkùlú(H) `òb`orí p`íná t̀íbí → [kùlúkùlú `òb`orí p`íná t̀íbí]
 - black goat white head ‘a black goat’s white head’
- The C class – Sponsors (L)
 - p`íná(L) `òb`orí kùlúkùlú t̀íbí → [p`íná `òb`orí kùlúkùlú t̀íbí]
 - white goat black head ‘a white goat’s black head’

Recall RQ4

- **Fourth Research Question (RQ4):**
 - Within the phonological module, which kinds of phonological processes are possible? And what restrictions are there, especially those imposed from syntax?
- One major restriction on long-distance tone effects in Izon and Kalabari:
 - **It cannot replace any tones after the lexical head**

Restrictions on long-distance tone

- Pre-modifiers in Izon

- Mod1 Mod2 Noun

- **ìnè**ⓁⓂ **tárá** **bùrù** → **ìnè** **tàrà** **búró**
- my three yam ‘my three yams’

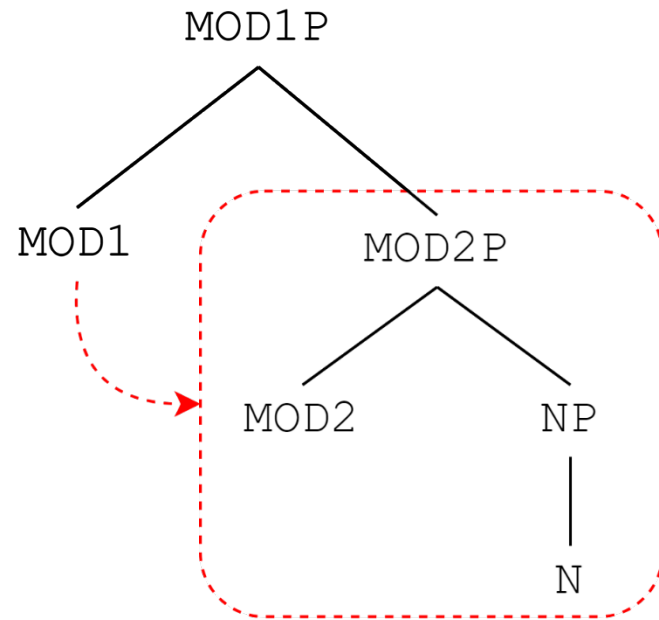
- Post-modifiers in Izon

- Mod1 Noun Mod2

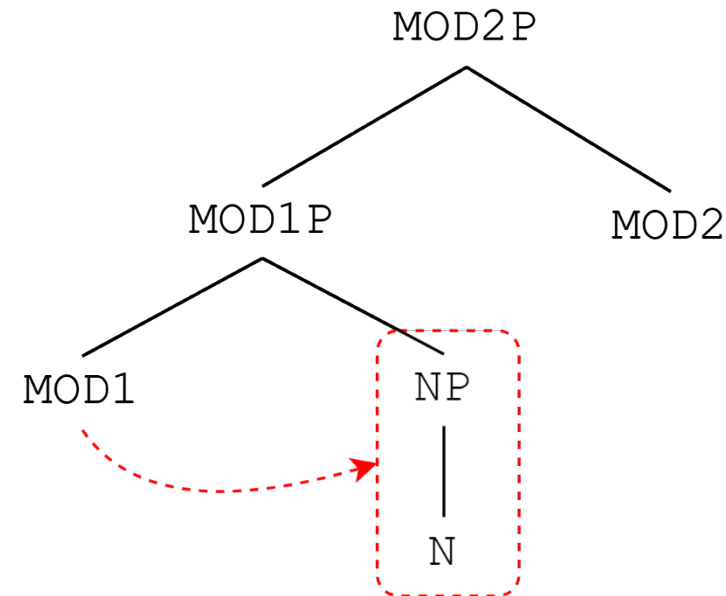
- **ìnè**ⓁⓂ **bùrù** **bì** → **ìnè** **búró** **bì** (Cf. * **ìnè** **bùrù** **bí**)
- my yam the ‘the yam of mine’

Dominance tracks syntactic hierarchy

- Mod1 Mod2 Noun
- my three yam

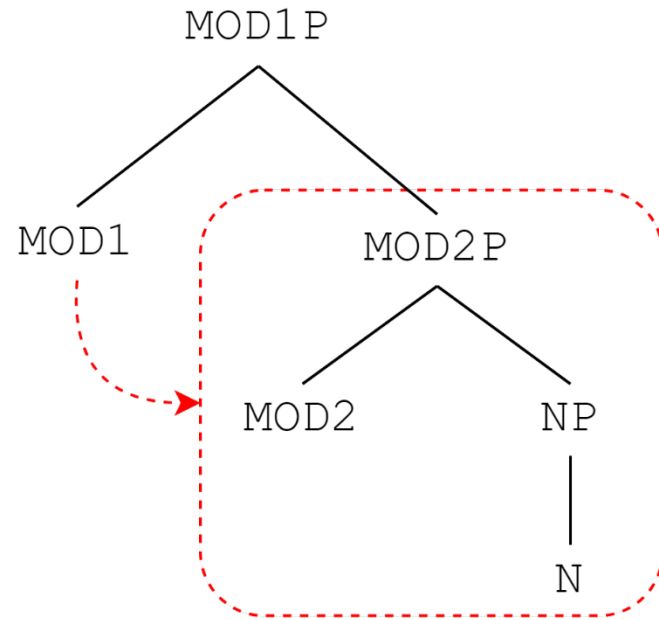


- Mod1 Noun Mod2
- my yam the

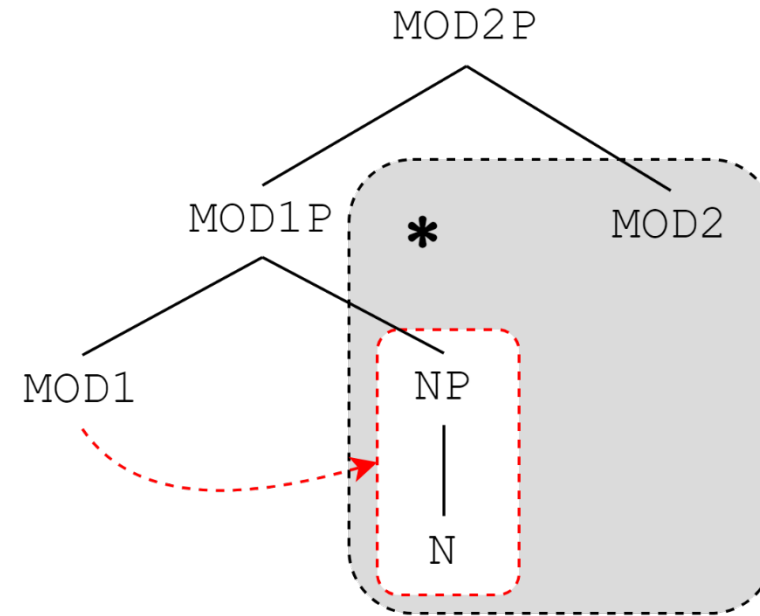


Dominance tracks syntactic hierarchy

- Mod1 Mod2 Noun
- my three yam



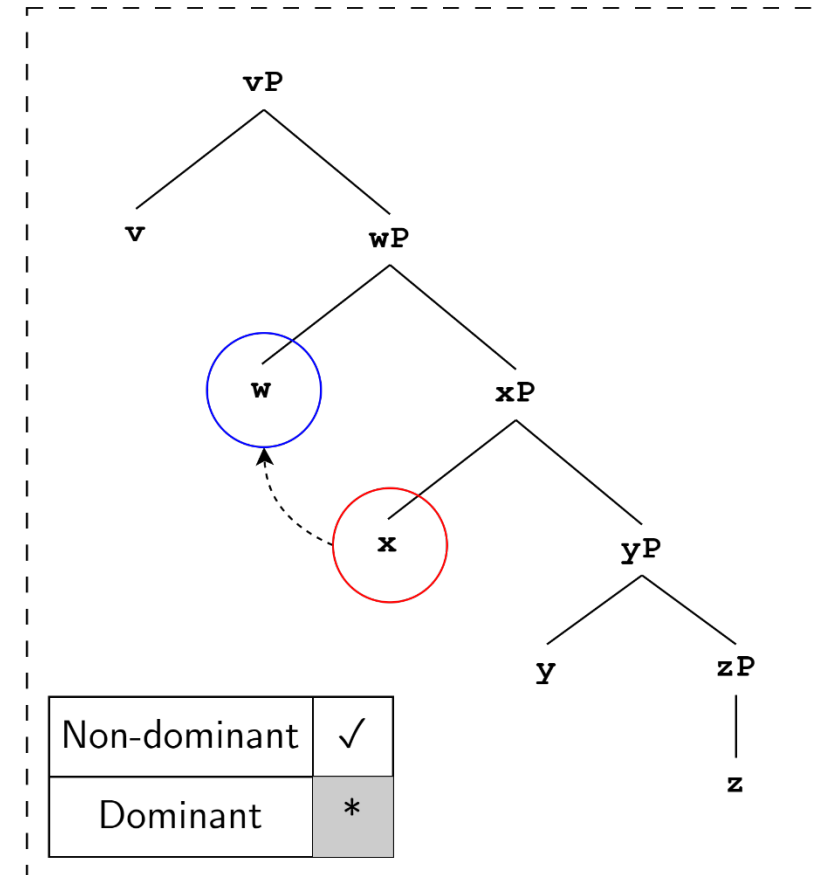
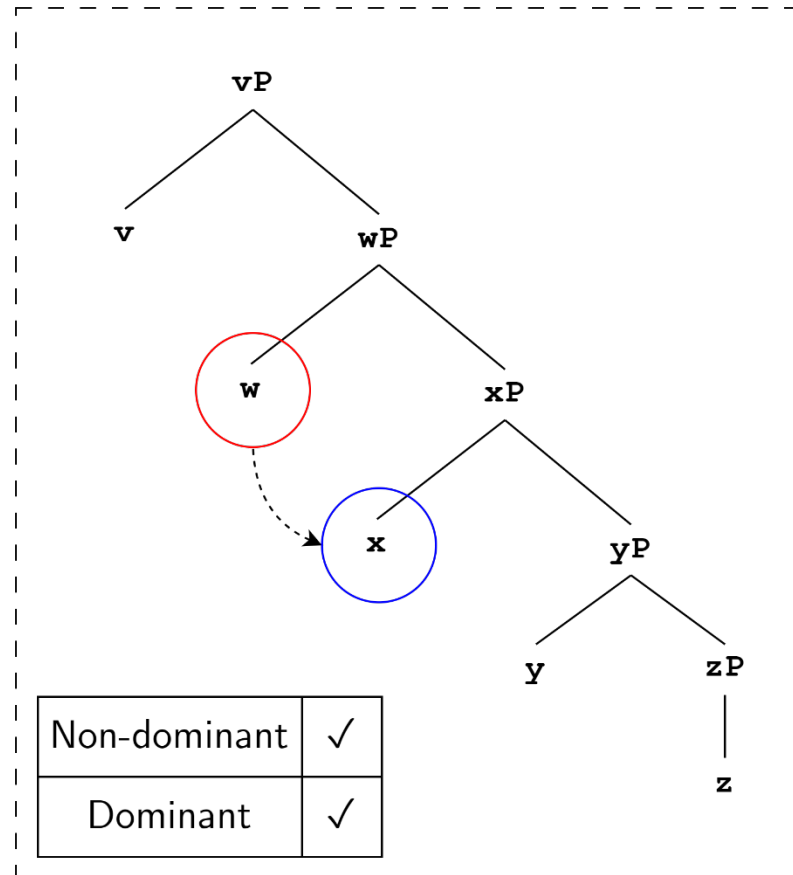
- Mod1 Noun Mod2
- my yam the



The Dominant Tone Asymmetry

- The Dominant Tone Asymmetry (**Rolle 2018**)

- Non-dominant tone can affect in **any** direction
- Dominant tone can only affect morphosyntactic **lower** constituents



Case study II: Interim summary

- This second case study involved **long-distance phonology**
- **Most cases** of long-distance phonology are **word-bound**, e.g. vowel harmony in Hungarian
- However, based in part of original **fieldwork on Ijoid** family in Nigeria, **dominant grammatical tone** patterns show spreading which go **beyond the word** (replicated across African languages)
- A major restriction on this spreading: **‘Dominant Tone Asymmetry’**
 - These long-distance phonological patterns are unbounded going **down** the syntactic tree, but it is restricted from going **up** the syntactic tree
- **Implication for linguistic theory:** Underlying syntax constrains the kinds of phonological patterns seen in natural language

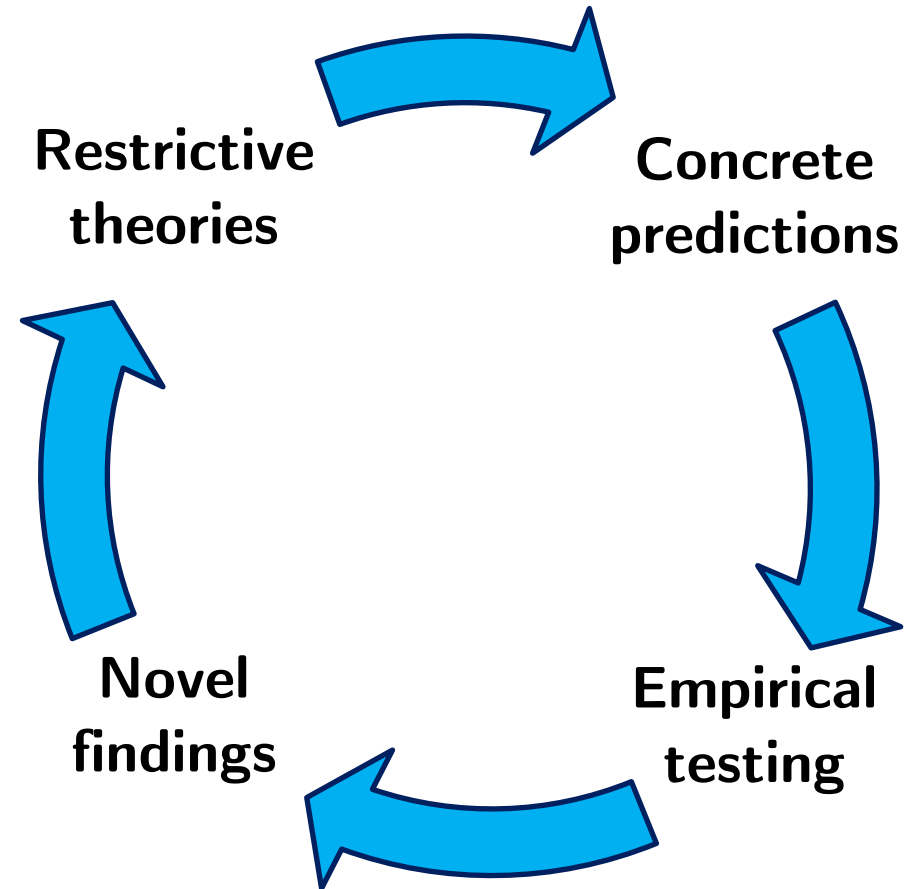
Part IV: Summary and discussion

General summary

- We examined the issue of **locality** within linguistic patterns
 - In a string (**a b c d e**), interactions of **a** & **b** are local but **a** & **c** are non-local
- We examined two cases of non-local **long-distance interactions**
 - Case study 1 – **Direct** long-distance effect within **morphology**:
Allomorphy selection, i.e. (**a b c d e**) → (**a b c d e**)
 - Case study 2 – **Indirect** long-distance effect within **phonology**:
Unbounded modification, i.e. (**a b c d e**) → (**a b' c' d' e'**)
- Our evidence came from linguistic **tone**, as it is used to **express grammatical meanings** on par with prefixes and suffixes in other languages
- We showed that **tone is special**: Tone shows **looser locality restrictions**, and is thus indispensable for theories of universal linguistic architecture
 - ****Why is tone special? Ask me during the question period****

Discussion point: The 'Scientific Dance'

- Restrictive **theories** make empirical **predictions** about what is possible in language, which require rigorous empirical testing
- Novel empirical **findings** cause us to retract, adjust, and/or expand the restrictiveness of our theories

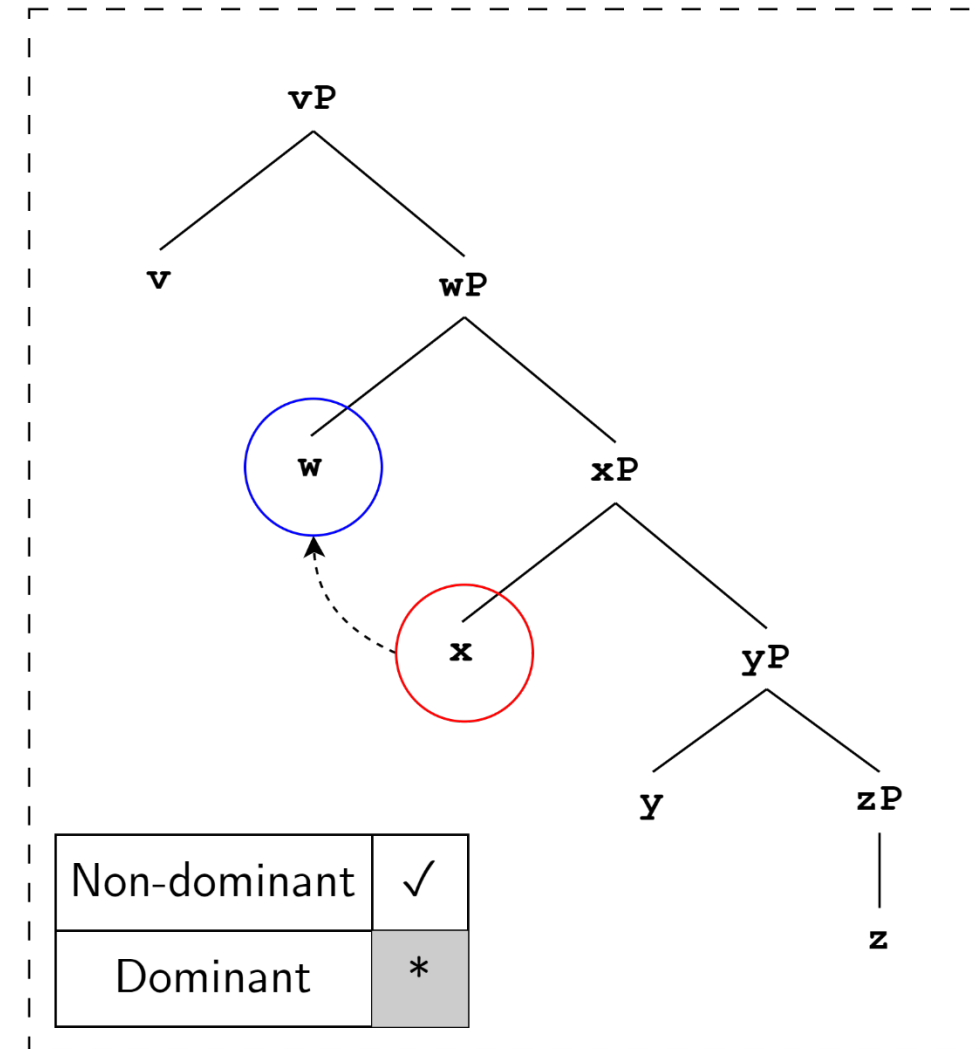


Discussion point: The ‘Scientific Dance’

- These research projects establish **two hypotheses** for future work
 - 1) Phonologically-conditioned non-local allomorphy is word-bound (i.e. the relevant locality domain is the word)
 - 2) Long-distance dominant grammatical tone cannot replace tone of elements in positions ‘upward’ in the syntactic tree
- Both of these hypotheses are **testable** and **falsifiable**

Discussion point: Linguistic ‘myopia’

- **Linguistic myopia:**
 - Grammatical tone can only affect the **edge** of that structure which is syntactically higher
 - It is **never dominant upward** (i.e. never unboundedly replacive)
 - Thus, its **upward view is myopic** – Can only ‘see’ what is adjacent
- We can see linguistic myopia in **morphological patterns** as well



Discussion point: Linguistic ‘myopia’

- We saw phonologically-conditioned **non-local allomorphy** in Cilungu

◦ u-á-cí-sópolol-il-e (H)² → u-á-cí-sópólol-il-e
◦ AGR-TAM-recent-untie-TAM-TAM GT ‘he/she recently untied’

- **Syntactic locality requirement**

- Allomorphy is **blocked** when **negation** syntactically **intervenes** between the **trigger** (agreement) and the **target** (tense/aspect)

◦ * a-tá-á-cí-sópolol-il-e (H)²
◦ AGR-**NEG**-TAM-recent-untie-TAM-TAM GT ‘he/she didn’t recently untie’

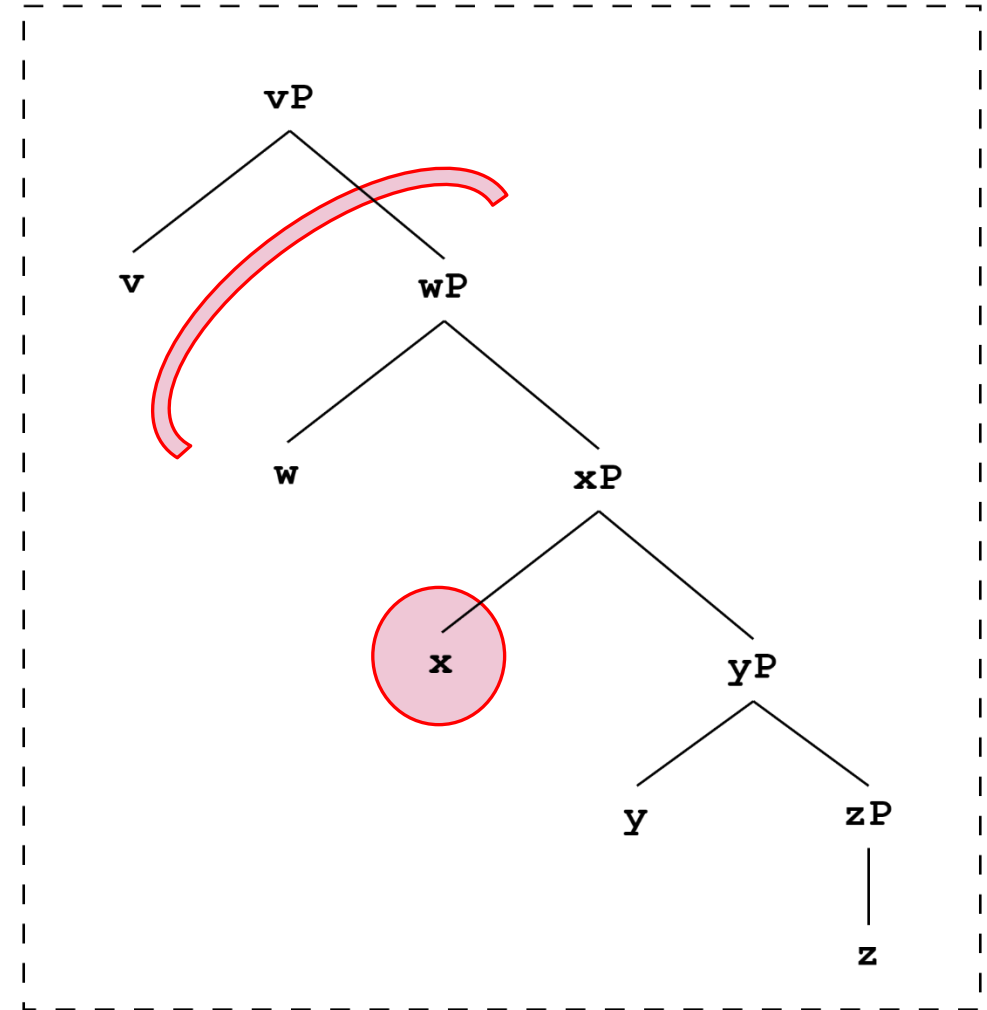
- Instead, different GT allomorphy is conditioned by negation

Discussion point: Linguistic ‘myopia’

- Theoretical literature suggests a syntactic hierarchy:
 - **AGR** > **NEG** > **TENSE** > **ASPECT**
- **Morpho-syntactic myopia:**
 - Thus it appears that a syntactic element intervening may **disrupt** phonologically-conditioned non-local allomorphy
 - I.e. **TENSE** and **ASPECT** cannot access beyond the local head **NEG** to the non-local head **AGR**

Discussion point: Linguistic ‘myopia’

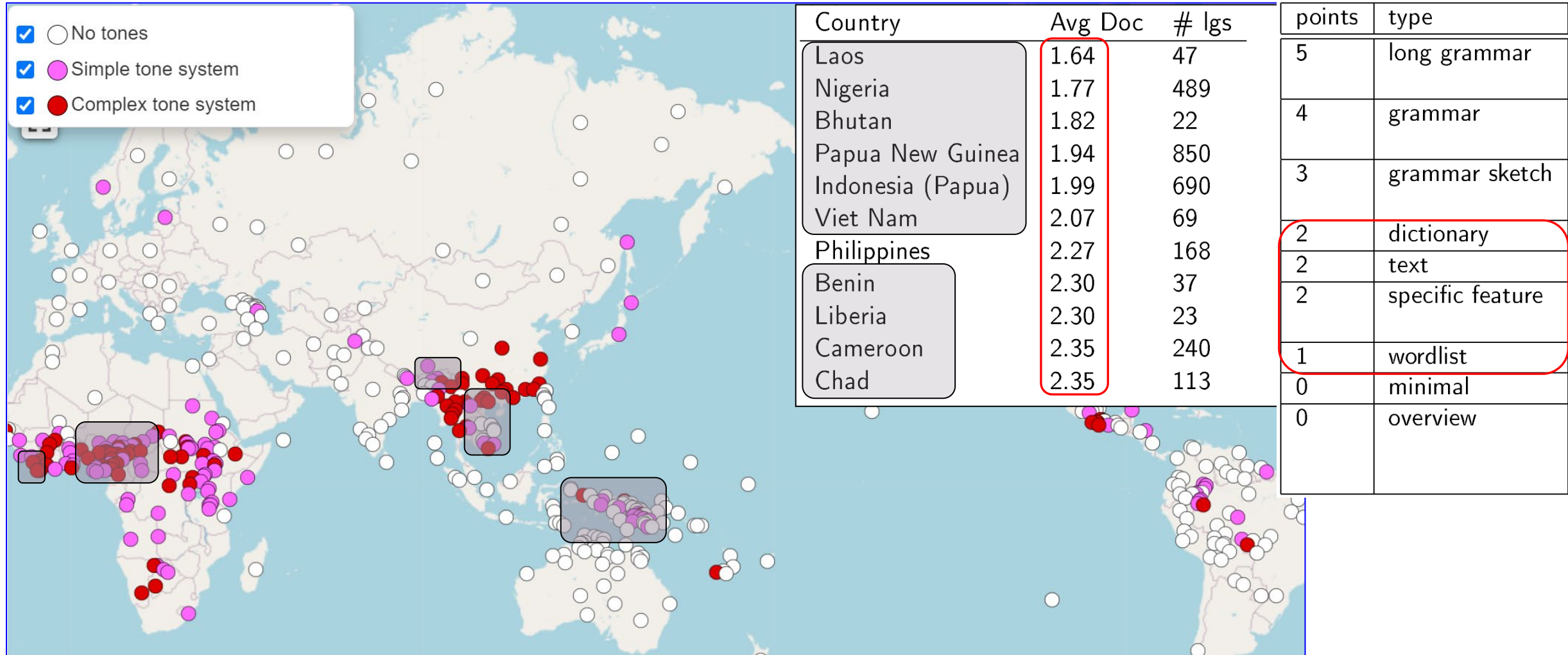
- A unified theory of locality must involve **restricted access at spell-out**
 - Access to **anything downward**
 - But only **one element upward**
- This restriction dictates:
 - What the **triggers of allomorphy** can be (involved in non-local morphology)
 - What **phonological domains** can be formed (resulting in long-distance grammatical tone effects)

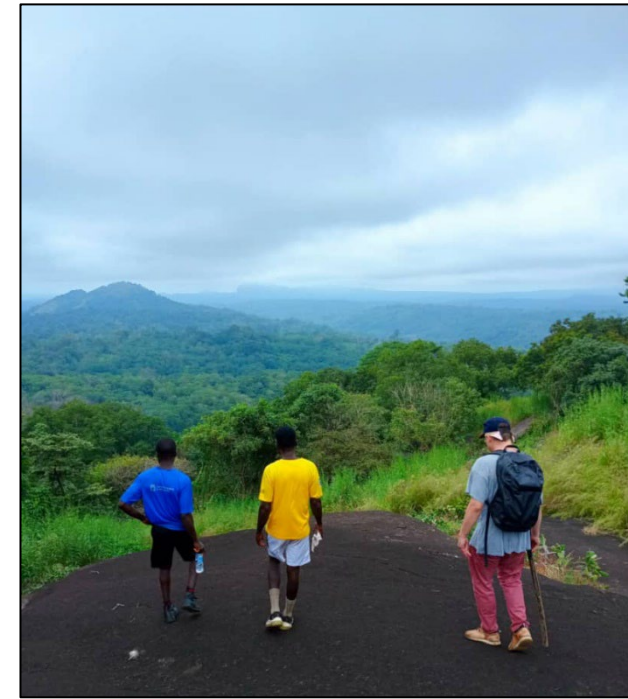


Finally, much to discover yet ...

- Regardless of theoretical challenges, two things remain true
 - Tone is **unique** in showing the ‘**outer limits**’ of what is possible in phonology and its interfaces with other parts of grammar
 - **Low-resource minority languages** continue to play an outsized role in our theoretically-oriented pursuits
- **Important note:** Our current sample of human language suffers tremendously from under-description and under-documentation, especially of tone languages and the tone systems contained within
- “Not more than 10-15% of languages have been described comprehensively”, most of which are not tone languages

Finally, much to discover yet ...





**Thank you for
listening!**

References:

www.nicholasrolle.com

