

Downstep in Santiago Laxopa Zapototec and the prosodic typology of VSO languages

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Syntax-Prosody Interface and Match Theory

- Mapping between syntactic structure and prosodic structure
- **Match Theory** (Selkirk 2009, 2011): MATCH constraints violated by any non-isomorphism
- Non-isomorphism caused by prosodic markedness constraints

Match Theory and VSO

- Two sources for prosodic variation:
 - (i) Syntactic structure
 - (ii) Syntax-prosody mapping
- **This talk:** Hold (i) constant to examine (ii) in VSO languages
- **The puzzle:** Match Theory has an unpredicted gap
- **The contribution:** We identify a language that fills that gap and present an OT analysis that is able to capture this expanded typology

The Puzzle

- Known variation in the phrasing of VSO sentences:

- Irish (Celtic: Elfner 2012, Bennett et al. 2016) (1a)/(1b)
- Otomi (Oto-Manguean: Palancar 2004) (1b)
- Ch'ol (Mayan: Clemens & Coon 2018, Clemens to appear) (1c)

(1) (a) V [SO] (b) [VS] O (c) [V] [S] [O]

- **Gap:** No known languages with only (1a). (Kalivoda 2018)
- **A problem for Match Theory:** (1a) is exactly what we'd derive if no markedness constraints outrank MATCH.

Santiago Laxopa Zapotec (SLZ)

- Spoken in Santiago Laxopa, Ixtlán, Oaxaca, Mexico
- Oto-Manguen - Northern Zapotecan (Sierra Norte)
- ~1200 speakers
- Most speakers bilingual Spanish-SLZ

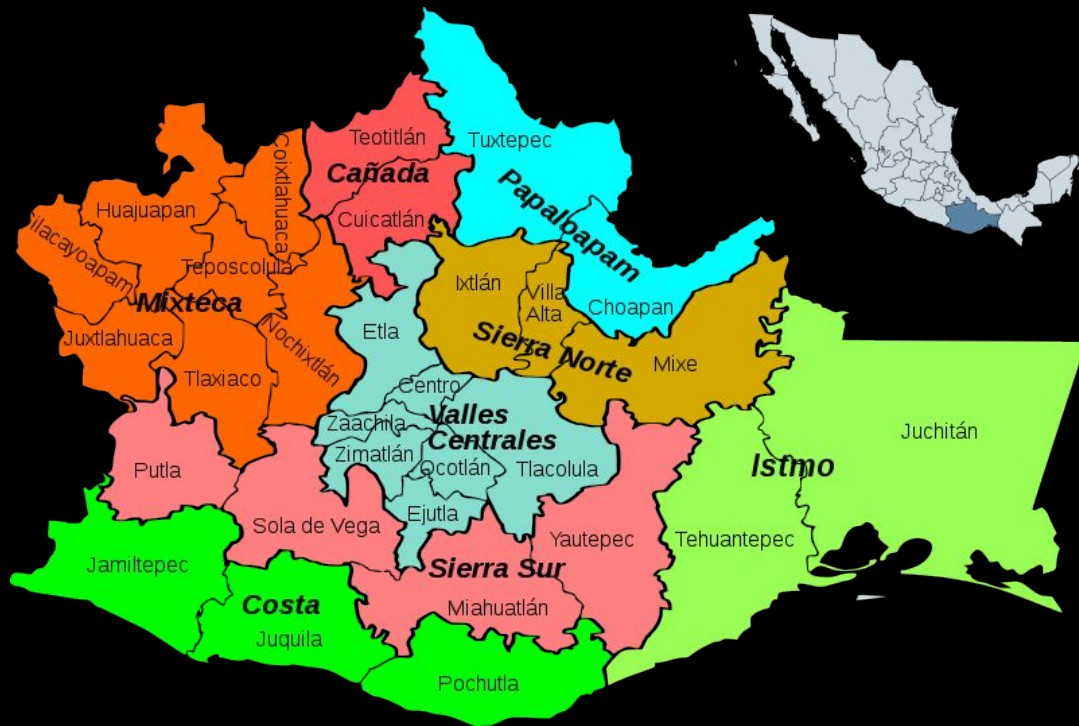


Figure 1: Map of Mexico (top right) and Oaxaca

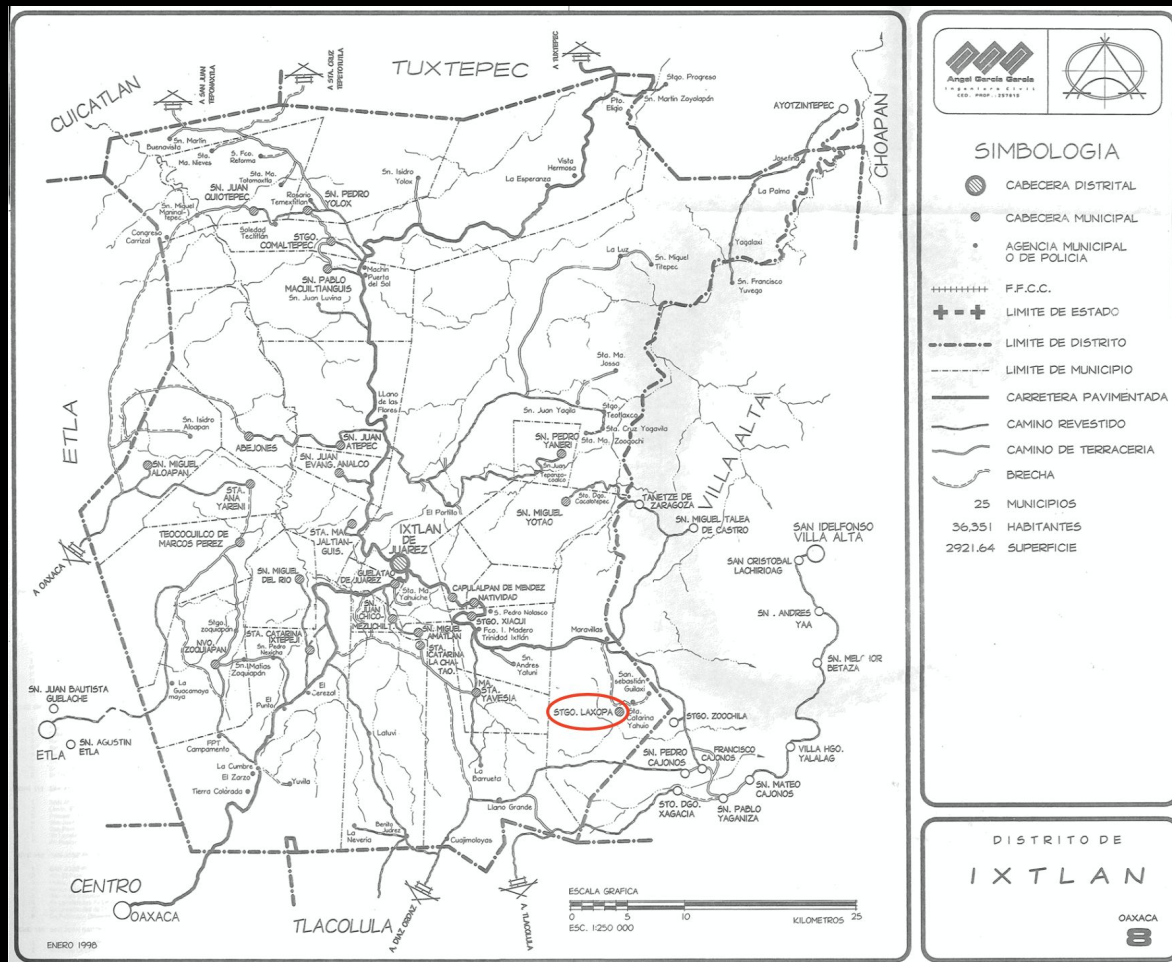


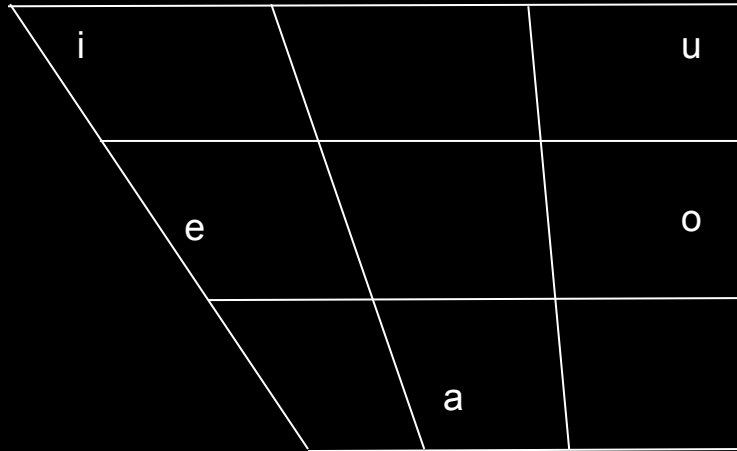
Figure 2: Map of Villa Alta showing the location of Santiago Laxopa (Morimoto 2017)

Methodology

- Working with one native speaker consultant in Santa Cruz
- All fieldwork thus far remote due to COVID-19 pandemic
- Zoom and Zencastr
 - Zencastr - podcasting platform, records locally without compression
- Future plans to confirm with more speakers
 - So far unable to connect with additional speakers in Laxopa
- Elicitation of sentences/translations from Spanish
- Humming
- Learned to hear tone before using Praat to confirm

Vowels in SLZ

Vowel inventory



4 phonation types

- Modal
- Breathy
- Checked
- Rearticulated

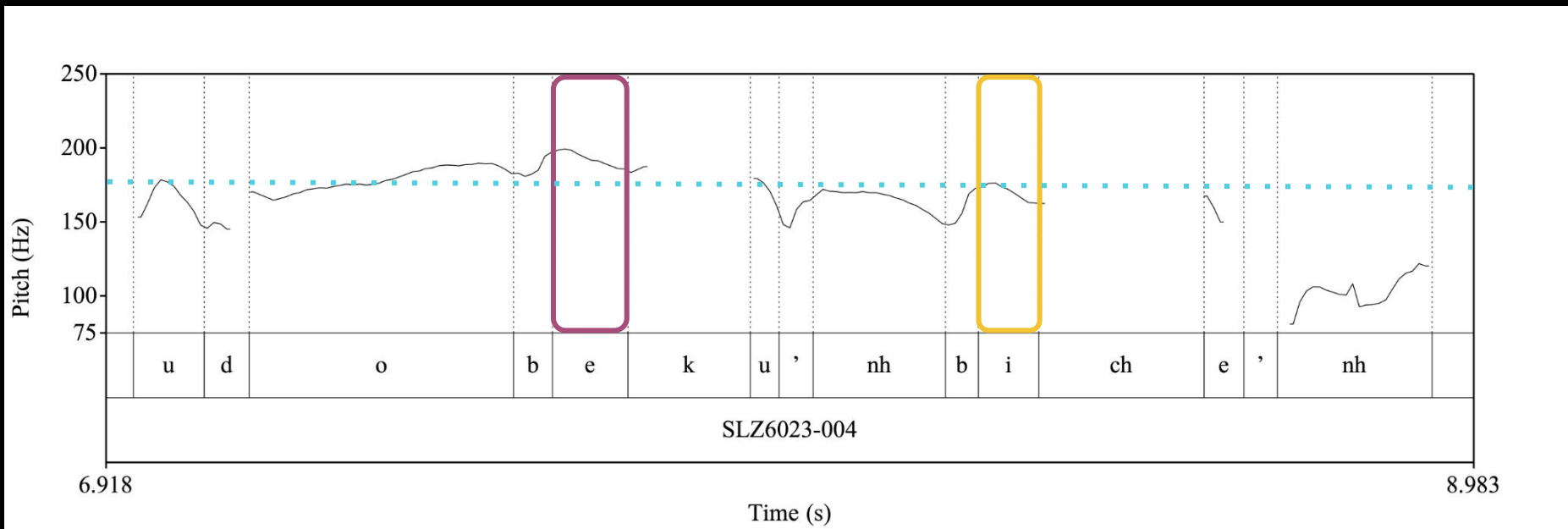
Tone in SLZ

- 3 tonal registers (H, M, L)
- 5 tonal patterns possible on a syllable
 - H, M, L
 - MH (Rising)
 - HL (Falling)
- Only bimoraic syllables seem to host rises and falls

Downstep in SLZ

- Downstep is a process of F0 lowering (Connell 2011)
 - Commonly, triggered by a L for subsequent Hs
 - Lowering creates a new “ceiling” for all subsequent tones
- Downstep in SLZ
 - Triggered by H tones
 - Separable from declination
 - Prosodically bounded
 - Only applies within a certain prosodic domain containing the trigger
 - For us: non-maximal phonological phrase φ_{NONMAX}

Downstep: **H** after local H trigger



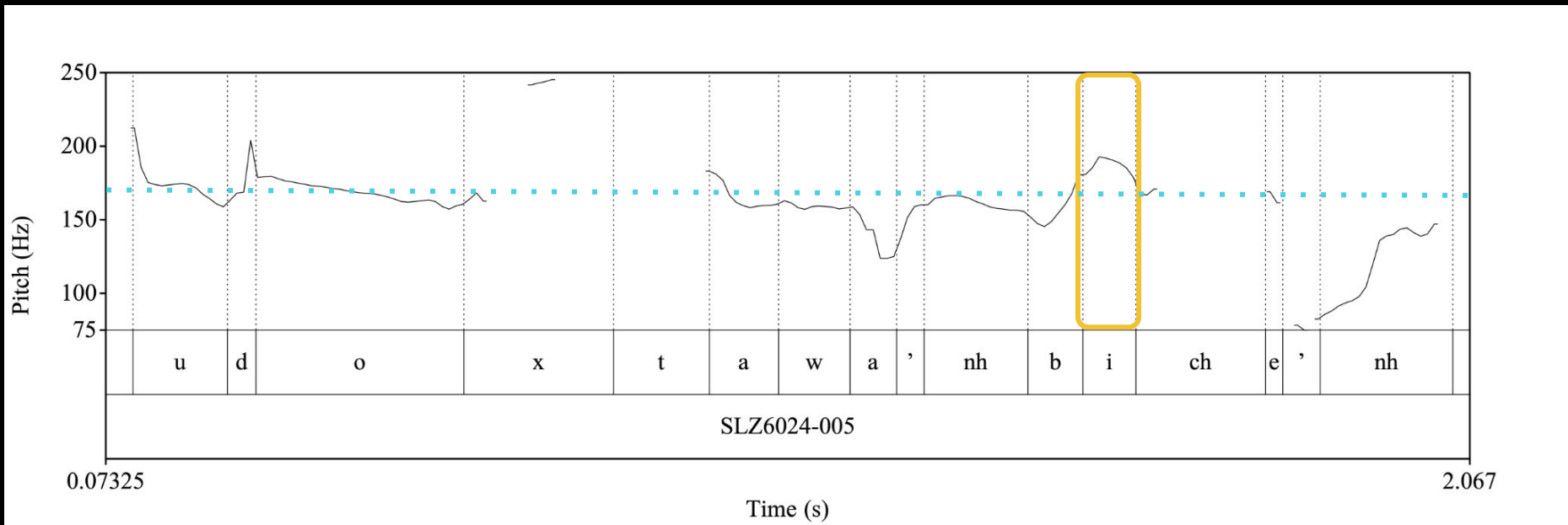
Udo^L
ate

be^Hku'nh^L
dog

bi^Hche'nh^L.
chapulín

(The dog ate the chapulín.)

Compare to: **H** after no local H trigger



Udo^L
ate

xta^Lwa'nh^L
grandmother.my

bi^Hche'nh^L.
chapulin

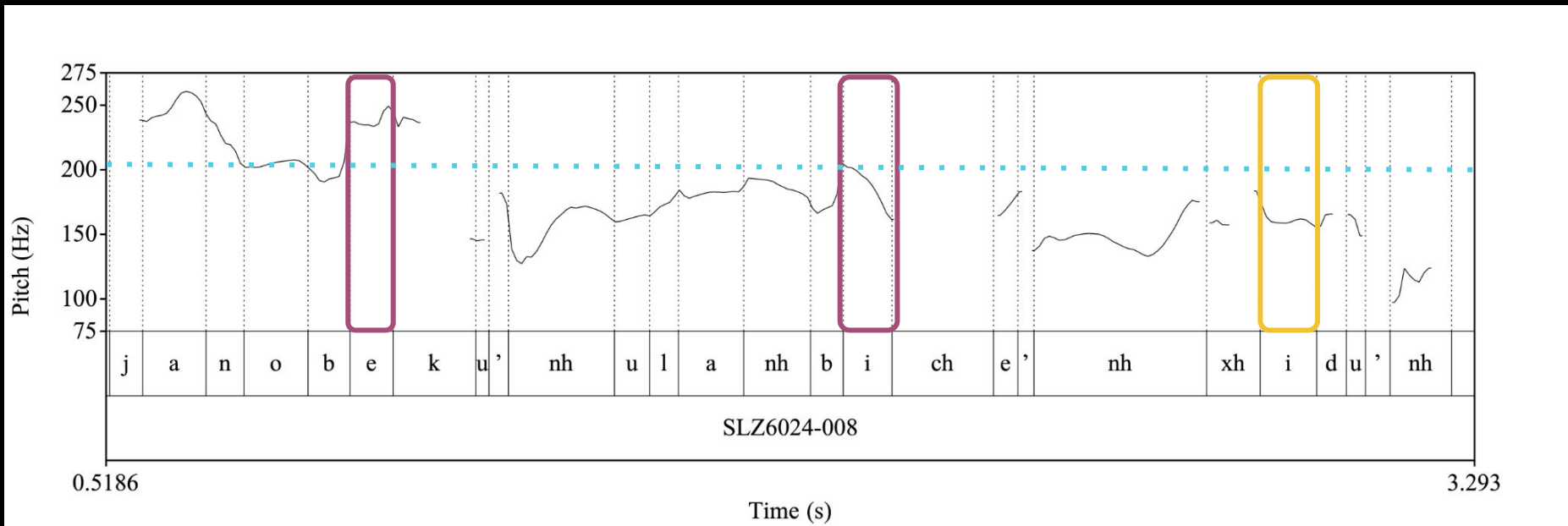
(My grandmother ate the chapulin.)

Using downstep to probe prosodic structure

- In **V S O** sentences:
 - Consistent downstep between arguments
 - Verbs cannot trigger downstep, even internally
 - **V [S O] phrasing**, where V is a prosodic adjunct (lacks its own ϕ)
- In **V=S O** sentences, with cliticized subjects:
 - Subjects no longer trigger downstep in objects
 - No downstep within V=S
 - **V=S [O] phrasing**, where V=S is a prosodic adjunct

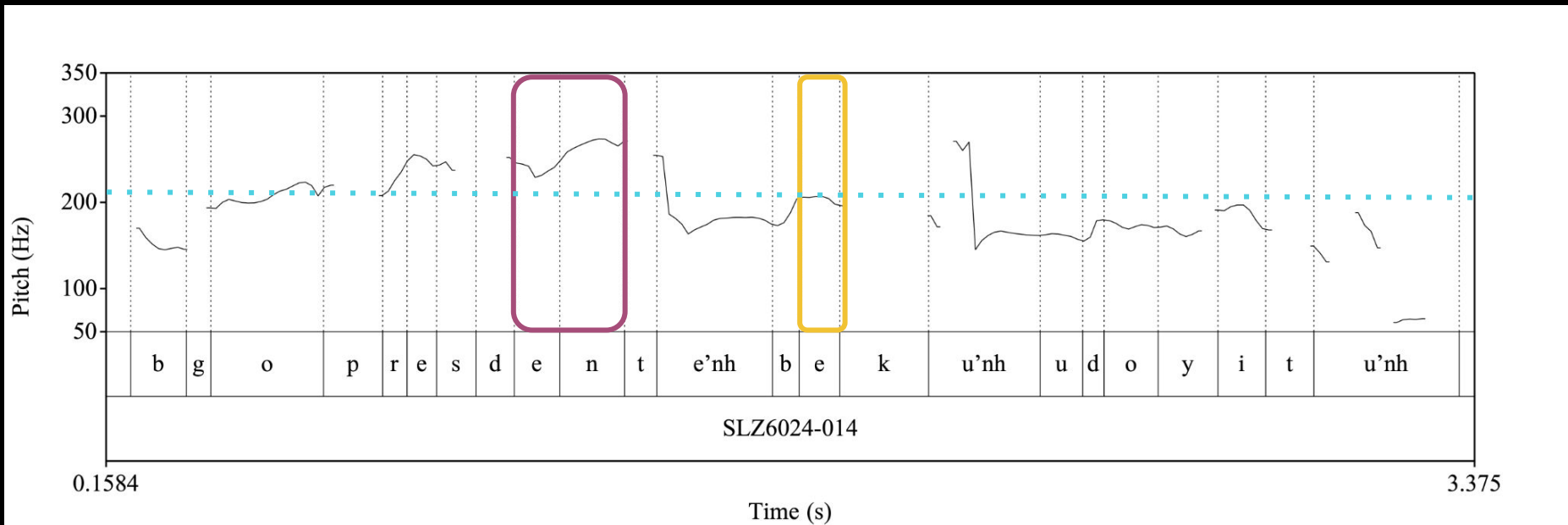
DOWNSTEP & PROSODIC PHRASING

Downstep from **S** to **O** holds even with additional weight



Ja^Hno^L [**be**^Hku^Lnh^Lulanh^L **bi**^Hche^Lnh^L] **xi**^Hdu^Lnh^L. (The dog who stole the chapulín chased the cat.)
chased dog stole chapulín cat

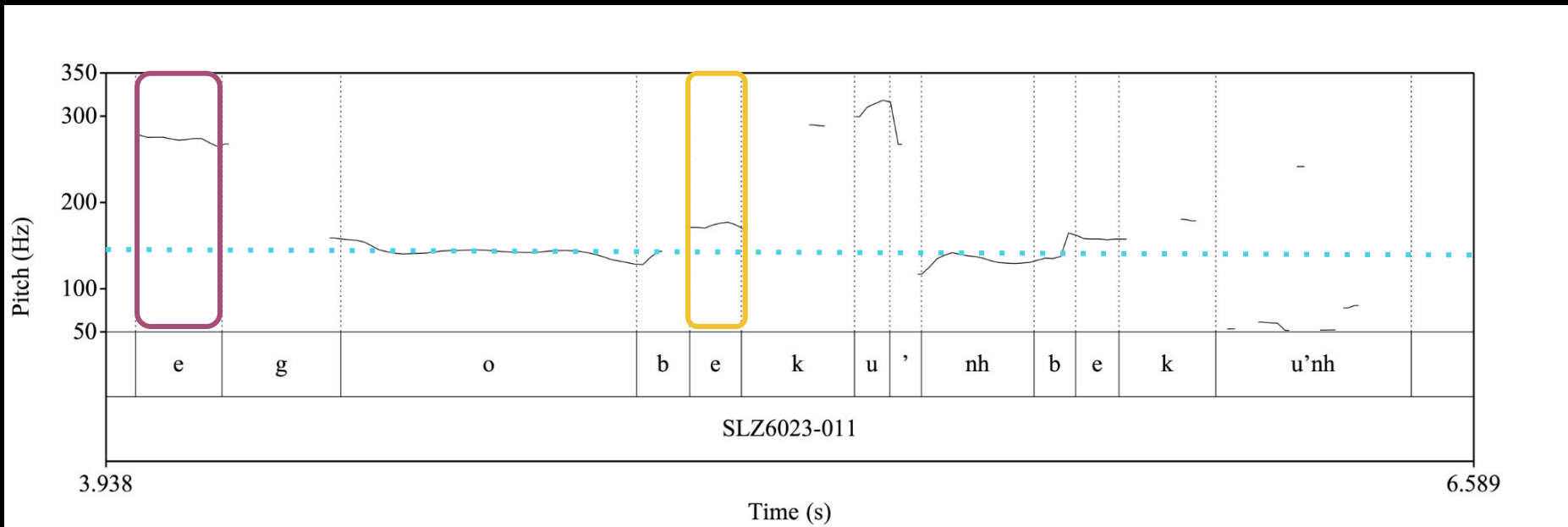
And even downstep from **S** to heavy **O**



Bgo^L pres^M **dent**^H e'nh^L [**be**^H ku'nh^L udo^L yi^H tu'nh^L]. (The mayor fed the dog who ate the pumpkin.)

fed mayor dog ate pumpkin

Verbs with **H** don't trigger downstep on **S**



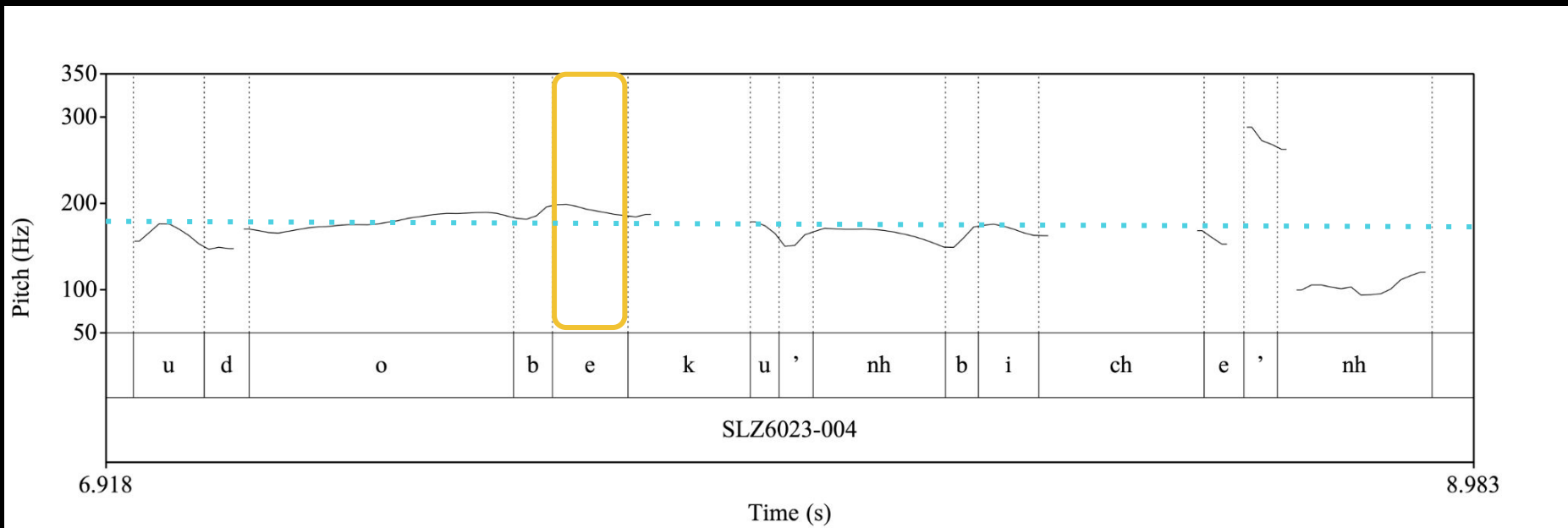
E^Hgo^L
FUT.feed

be^Hku'nh^L
dog

be^Hku'nh.
dog

(The dog will feed the (other) dog.)

Compare **H subjects** in the absence of a H verb:

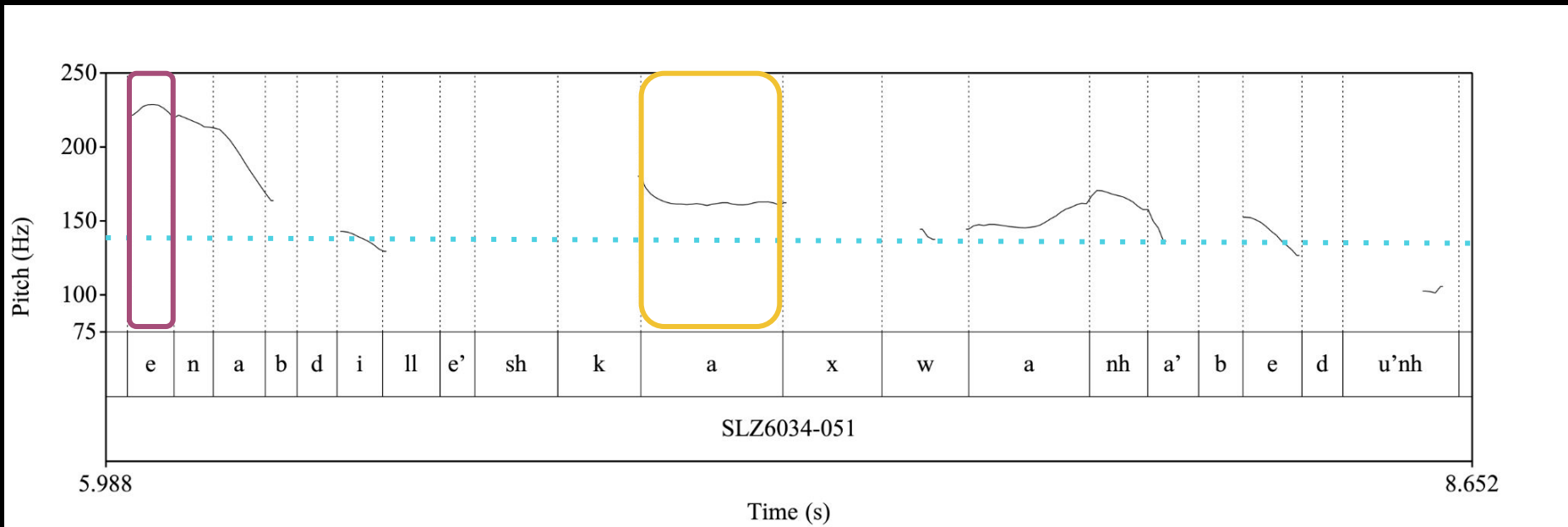


Udo^L
ate

be^Hku'nh^L
dog

bi!^{HH}che'nh^L. (The dog ate the chapulín.)
chapulín

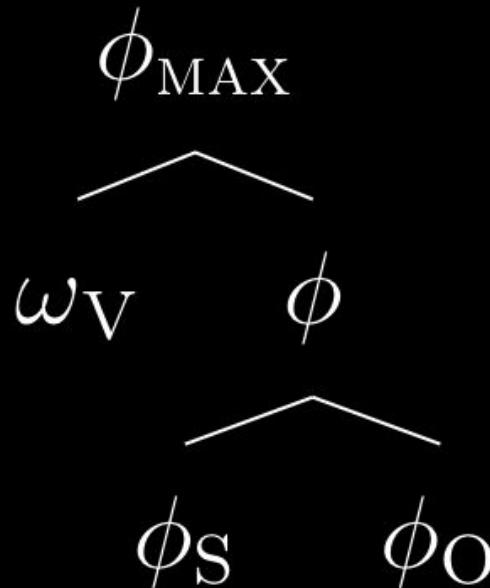
H tones in V can't trigger downstep for later H tones in V



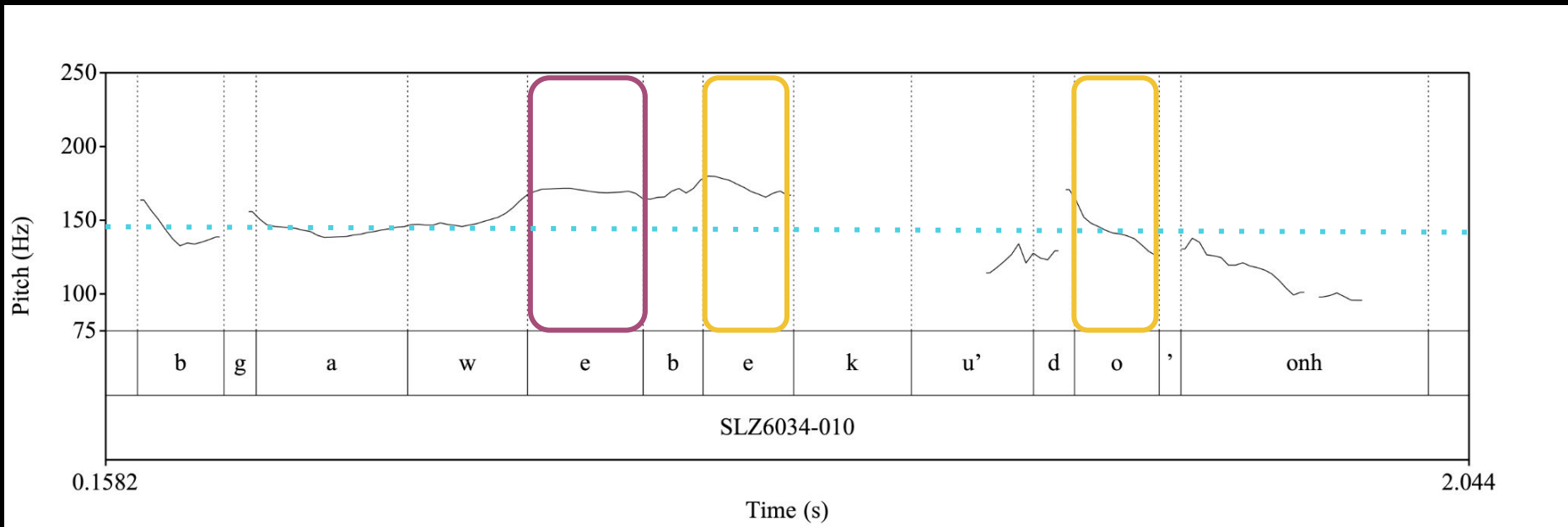
E^Hna^Lbdi^Llle^L**shka^H** Xwanh^{MH}a^L Be^Hdw'nh^L. (J. will greet P. energetically.)
 FUT.greet.much Juana Pedro

Resulting phrasing

- S and O always share a prosodic unit, even when internally complex
 - Suggestive of ϕ -recursion (Ito & Mester 2012)
 - Consistent with apparent prosodic break after V
- V itself is adjoined to the maximal prosodic unit
 - There is no downstep domain [V S O]
 - V itself does not contribute a ϕ
 - Note, choice point:
 - Assume ϕ_{MAX} isn't a downstep domain, or
 - Assume no ϕ_{TP} , level-skipping to an intonational phrase

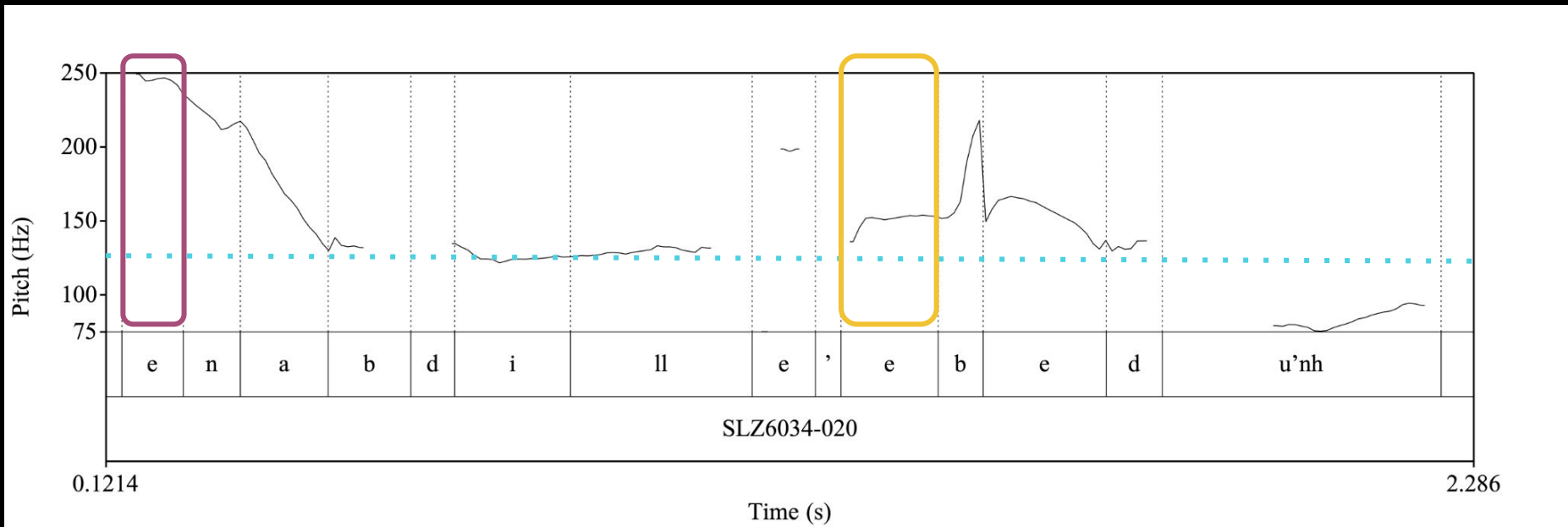


S clitics don't trigger downstep on **O**



Bga^Lwe^{'H} be^Hku'nh^L do^{'H}o'nh^L. (She fed the little dog.)
 fed=she dog little

Verbs with **H** don't trigger downstep on **S** clitics

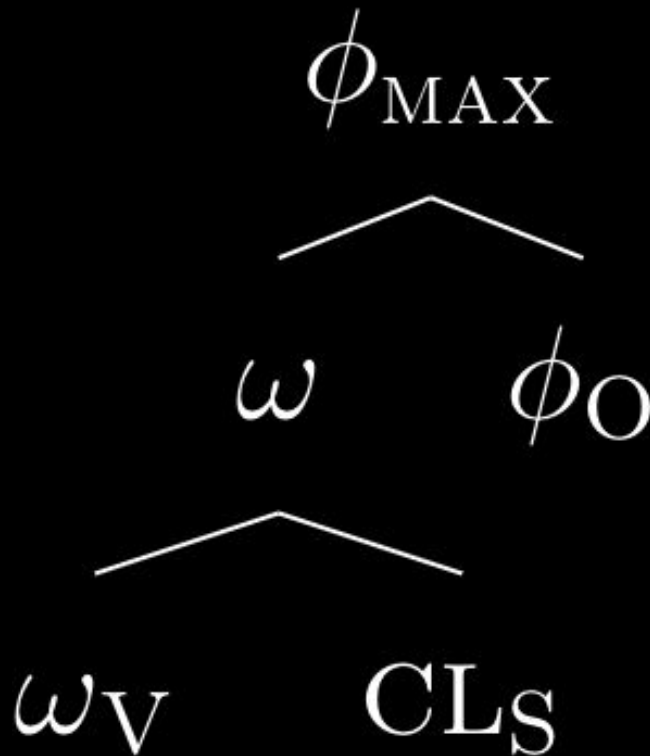


E^Hna^Lbdi^Llle'**e^H**
FUT.greet=she

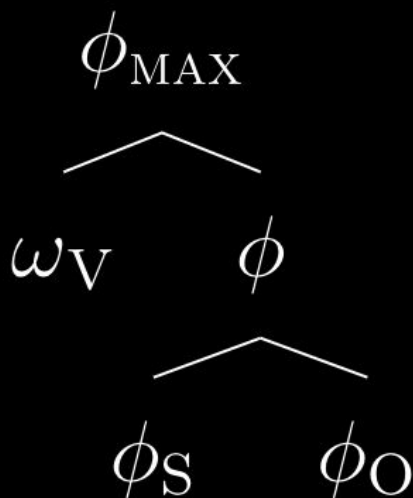
Be^Hdw'nh^L. (She will greet Pedro.)
Pedro

Resulting phrasing

- Clitic S never remains together with O
- The V=S complex is again adjoined
 - There is no downstep domain [V=S O]
 - V=S itself still does not instantiate a ϕ
 - Same choice point regarding the maximal prosodic unit

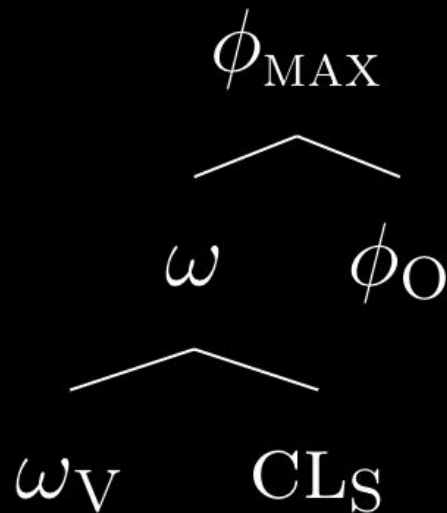


Interim summary: Two phrasings diagnosed by downstep



Phrasing (1): V [S O]

- The occurrence of Phrasing (1) with simple and heavy subjects fills the gap we identified.
- Phrasing (2) is similar to the phrasing of simple subjects in Irish, but here it is only attested for clitics.



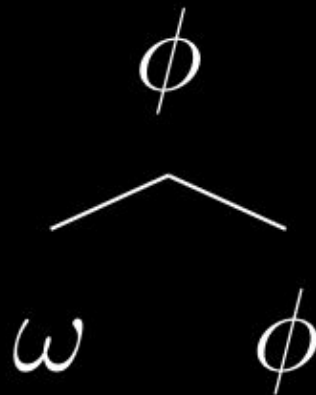
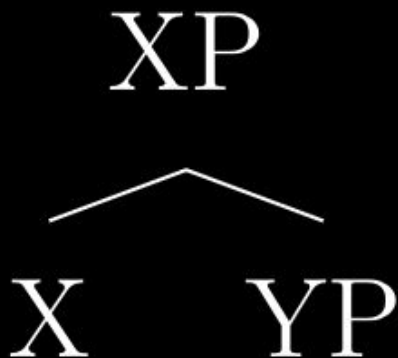
Phrasing (2): V=S [O]

ANALYSIS

OT analysis

MATCH(XP, ϕ)

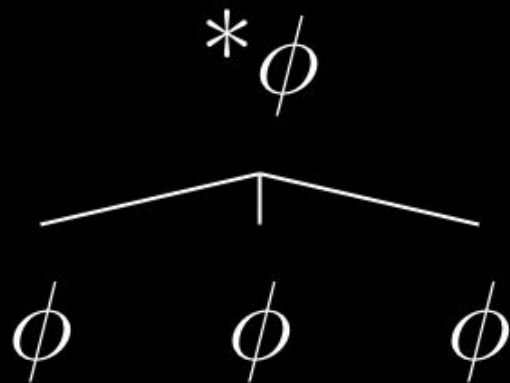
AOV for any phrase XP in syntactic constituent structure that is not matched by a corresponding phonological phrase ϕ in phonological representation.



OT analysis

BINARITY

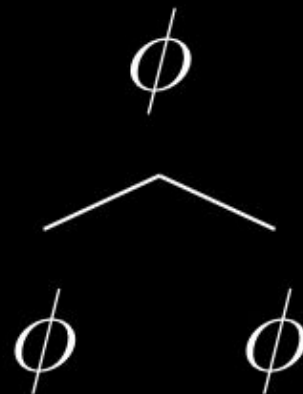
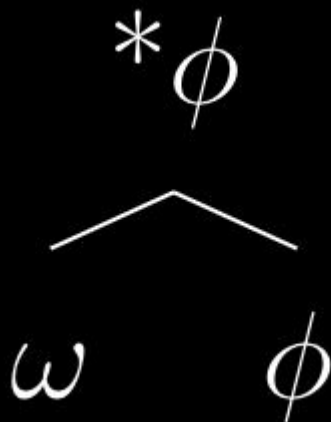
Optimal prosodic constituents are binary-branching.




OT analysis

EQUALSISTERS

AOV for every ϕ whose daughters are not all of the same category as one another.



SLZ simple arguments: MATCH, BIN >> EQSIS

[_{TP} verb [_{XP} DP _{subj} [_{YP} DP _{obj}]]]	MATCH	BIN	EQSIS
 a. (verb _{wd} (subj _{wd} obj _{wd}))	*(YP)		*
b. ((verb _{wd} subj _{wd}) (obj _{wd}))	*(XP)	*! _W	L
c. ((verb _{wd} subj _{wd}) obj _{wd})	*(XP)*(YP)! _W		*
d. (verb _{wd}) (subj _{wd}) (obj _{wd})	*(TP)*(XP)! _W	*!*** _W	L

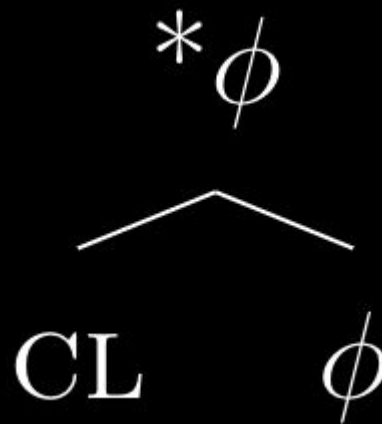
SLZ complex arguments: The same

	$[_{TP} \text{ verb } [_{XP} [N \dots]_{\text{subj}} [_{YP} [N \dots]_{\text{obj}}]]]]$	MATCH	BIN	EQSIS
☞	a. $(\text{verb}_{\text{wd}} ((\text{subjP}) (\text{objP})))$			*
	b. $((\text{verb}_{\text{wd}} (\text{subjP})) (\text{objP}))$	$*(XP)!_W$		*
	c. $(\text{verb}_{\text{wd}} (\text{subjP}) (\text{objP}))$	$*(XP)!_W$	$*!_W$	$**_W$
	d. $(\text{verb}_{\text{wd}}) (\text{subjP}) (\text{objP})$	$*(TP)!*XP_W$	$*!*_W$	L


Explaining the phrasing of clitics: STRONGSTART

STRONGSTART (Bennett et al. 2016)

AOV for any prosodic constituent above the level of the word that has at its left edge an immediate subconstituent that is smaller than a word (e.g., clitics).



SLZ clitic subjects: SS >> MATCH, BIN


[_{TP} verb [_{XP} DP _{subj_CL} [_{YP} DP _{obj}]]]	SS	MATCH	BIN	EQSIS
 a. ((verb _{wd} subj _{cl}) _{wd} (obj _{wd}))		*(XP)	*	**
b. (verb _{wd} (subj _{cl} (obj _{wd})))	*! _W	L	*	**
c. (verb _{wd} (subj _{cl} obj _{wd}))	*! _W	*(YP)	L	**

SLZ vs Irish: The phrasing of lonely light subjects


SLZ

$[_{TP} \text{ verb } [_{XP} \text{ DP}_{\text{subj}} [_{YP} \text{ DP}_{\text{obj}}]]]$	MATCH	BIN	EQSIS
 a. $(\text{verb}_{\text{wd}} (\text{subj}_{\text{wd}} (\text{objP})))$		*	**
b. $((\text{verb}_{\text{wd}} \text{subj}_{\text{wd}}) (\text{objP}))$	$*(XP)!_{\text{W}}$	*	L
c. $((\text{verb}_{\text{wd}} \text{subj}_{\text{wd}}) \text{objP})$	$*(XP)!*(YP)_{\text{W}}$	L	L

Irish

$[_{TP} \text{ verb } [_{XP} \text{ DP}_{\text{subj}} [_{YP} \text{ DP}_{\text{obj}}]]]$	EQSIS	MATCH	BIN
a. $(\text{verb}_{\text{wd}} (\text{subj}_{\text{wd}} (\text{objP})))$	$*!*_W$	L	*
 b. $(\text{verb}_{\text{wd}} \text{subj}_{\text{wd}}) (\text{objP}))$		$*(XP)$	*
c. $((\text{verb}_{\text{wd}} \text{subj}_{\text{wd}}) \text{objP})$		$*(XP)*(YP)!_{\text{W}}$	L

SLZ vs Ch'ol

	$[_{TP} \text{ verb } [_{XP} \text{ DP}_{\text{subj}} [_{YP} \text{ DP}_{\text{obj}}]]]$	MATCH	BIN	EQSIS
SLZ →	 a. $(\text{verb}_{\text{wd}} (\text{subj}_{\text{wd}} (\text{objP})))$		*	**
	b. $((\text{verb}_{\text{wd}} \text{subj}_{\text{wd}}) (\text{objP}))$	$*(XP)!_W$	*	L
Ch'ol →	c. $(\text{verb}_{\text{wd}}) (\text{subj}_{\text{wd}}) (\text{obj}_{\text{wd}})$	$*(TP)*(XP)!_W$	$**!*_W$	L

Ch'ol is harmonically bounded with our current constraints.

Requires some additional constraint(s) to be ranked above MATCH.

Conclusion

- As evidenced by patterns in the occurrence of downstep, SLZ features consistent **V [SO]** phrasing for all lexical arguments
- This fulfills the typological predictions of the constraints we've discussed
 - Difference between Irish and SLZ comes down to the ranking of EQSIS over MATCH and BIN
 - As it stands, Ch'ol is unexplained: harmonically bounded by candidates MATCH and BIN prefer
 - If [V] [S] [O] phrasing is indeed possible, there must be some additional constraint(s) at work
- MATCH theory remains a well-motivated approach to the syntax-prosody interface

Thanks!



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