Microvariation in Turkic laryngeal systems

Synchrony and diachrony

Deepthi Gopal Stephen Nichols Pavel Iosad László Károly

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Overview

1. Turkic languages and their place within the Laryngeal Realism landscape

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2. Case study in microvariation: Turkish and Azeri
3. Diachronic account: language contact and/or the life cycle

Variation and microvariation in laryngeal phonology

The Laryngeal Realism Conjecture

- Languages fall into a small number of types with respect to their system of laryngeal contrast and patterning of laryngeal features
- Laryngeal specification is fundamentally privative
- The marked pole of the contrast
  - Shows greater phonological activity
  - Shows invariant phonetic realization
- Phonetic realization is defined in terms of phonation, usually measured by VOT

(Honeybone 2005, also e. g. Avery & Idsardi 2001, Beckman, Jessen & Ringen 2013)

The major types

- Voicing: [voiced] v. ∅
  - Phonetics: fully voiced v. short-lag VOT
  - Phonology: voicing assimilation, final devoicing
  - Examples: Bulgarian, Catalan, Russian, Hungarian (Petrova et al. 2006, Beckman, Jessen & Ringen 2013)

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- Other two-way systems
  - 'Overspecified' [spread glottis] v. [voiced]: Central Standard Swedish (Pétur Helgason & Ringen 2008)
  - Geminate v. singleton: Alemannic German (e.g. Kraehenmann 2003)
  - 'Strong' v. 'weak': Finnish, Estonian

Some issues with the typology

- Within-language variation (Kirby & Tan 2023, Puggaard-Rode 2024)
- Mixed evidence from other correlates (Kirby & Ladd 2019)
- Mismatches between phonological and phonetic evidence (Blaho 2008, Cyran 2013, Iosad 2017)
- Microvariation: our focus here

Microvariation

The Laryngeal Realism Conjecture underdetermines some aspects of the pattern

- If the |fortis| stops are long-lag VOT, then the |lenis| stops can be
  - Variably voiced: English, German, Welsh
  - Fully voiced: Qatari Arabic (Kulikov 2019)
  - Short-lag VOT: Icelandic, Danish, Scottish Gaelic (Beckman, Jessen & Ringen 2013, Nance & Stuart-Smith 2013)

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Maybe?
Our focus: diachronic typology of the (sub)types

Diachronic relationships between the types

- Changes in types often ascribed to contact (see also Natvig 2019)
  - Yiddish: aspirating → voicing (Slavic, Baltic)
  - Dutch: aspirating → voicing (Romance)
  - Breton: aspirating → voicing (Romance)

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  - Dutch: aspirating → voicing (Romance)
  - Breton: aspirating → voicing (Romance)
- … but otherwise the diachronic typology is not too clear

Example: hypotheses for Germanic

What was the laryngeal phonology of Proto-Germanic?

- Prototypical aspirating (Iverson & Salmons 1995, 2003, Salmons 2020)
  - Contact-induced change in Dutch, Yiddish…
  - Endogenous (?) change to voicing in Scots
  - Endogenous |lenis| voicing in Swedish
  - Endogenous (?) loss of voicing in Danish, Icelandic…
- Prototypical voicing (Steblin-Kamenskij 1963, Goblirsch 2005, Kümmel 2007)
  - Peripheral archaism: Dutch, Yiddish, Scots
  - Archaism: weak aspiration in some Low German (Schmidt & Vennemann 1985)
  - Loss of |lenis| voicing, push chain to aspirated |fortis|
    - Partial: English, German…
    - Full: Danish, Icelandic…

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How would we even decide?
One possibility: a more developed diachronic typology

Turkic laryngeal phonology

Laryngeal contrast in Turkic

- Generally |fortis| p t t͡ʃ k~q ≠ |lenis| b d d͡ʒ g~ɣ~ʁ
- Some neutralization/much disagreement in word-initial position
- Modern Turkish
  - *atı* 'horse-3SG' ≠ *adı* 'name-3SG'
  - *otu* 'grass-3SG' ≠ *odu* 'fire-3SG'
- Generally agreed
  - Aspirated |fortis| (Kallestinova 2004)
  - Partially voiced/otherwise 'weak' |lenis|

Alternation patterns

- Pervasive: progressive devoicing in clusters

Kyrgyz	‘father’	‘lake’	‘guest’
NOM	ɑtɑ	køl	qonoq
LOC	ɑtɑdɑ	køldø	qonoqto

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- Common in some parts: final ~ intervocalic |fortis| ~ |lenis|

Gagauz	‘handle’	‘bottom’
NOM	sɑp	dip
POSS.3SG	sɑpɨ	dibi
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- So far, so aspirating

Voicing and lenition

- Word-medial allophony
  - |fortis| / V̆ _
  - |lenis| / V̄ _

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PTu	Gloss	Turkmen	Sakha	Turkish	Tukha	Tofa	Tyva
**at*	‘horse’	at	at	at	aʰt	aˀt	aˀt
**at-I*	‘horse-3SG’	atɨ	ata	atɨ	aʰtə	aˀtɨ	aˀdɨ
**āt*	‘name’	a:d̥	a:t	ad	at	at	at
**āt-I*	‘name-3SG’	a:dɨ	a:ta	adɨ	adə	adɨ	adɨ

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**āt*	‘name’	aːd̥	aːt	ad	at	at	at
**āt-I*	‘name-3SG’	aːd̬	aːta	ad̬	adə	ad̬	ad̬

- In line with the phonological typology of lenition (Balogné Bérces & Honeybone 2012), but phonetically a bit baffling (Kümmel 2007)

Evidence for voicing?

- Turkish initial weakening

Front			Back		
*täŋiz	‘sea’	*deniz*	*tïg	‘needle’	*tığ*
*köz	‘eye’	*göz*	*kuš	‘bird’	*kuş*
*til	‘tongue’	*dil*	*kara	‘black’	*kara*

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- Lenis outcomes after V̄ traditionally described as ‘Oghuz voicing’

Phonetic (micro)variation

- General agreement that |p t t͡ʃ k| are ‘strong’, but what does this mean?
  - Longer closure
  - Aspiration v. voicing, though unclear how variable this is (Tenishev 2002: p. 49, Brendemoen 2021: p. 227)
- Pre-closure glottal activity in |fortis| stops
  - Preaspiration: Tukha (Ragagnin 2011), Salar (Tenishev 1976), Western Yugur (Roos 1998), Uigur (Dwyer 2000)
  - Preglottalization: Tyva (Kunaa 1957), Tofa (Rassadin 1971), Uigur (Yakup 2005)

Regional microvariation

What variation is traditionally described is often explicitly or implicitly explained by appeal to areality or contact

- Aspirated |fortis| v. voiceless |lenis| described for the Caucasus/Caspian area: Azeri, Karachai-Balkar, Urum… (Pritsak 1959, Gadzhieva 1996)
- Aspirated |fortis| v. voiceless |lenis| in Salar, Western Yugur: 'Amdo Sprachbund' (Janhunen 2016)
- Geminate voiceless |fortis| v. weakly voiced singleton |lenis| in Chuvash (Savelyev 2020): the Volga-Kama Sprachbund (Johanson 2000)

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Our aim

Can we make progress on understanding the diachronic typology of laryngeal contrast in Turkic?

Laryngeal microvariation in Oghuz

Research questions

- What is the basic type of laryngeal phonology and phonetics?
- How are the reflexes of the two stop categories distributed?
- What is the phonetic and/or phonological status of relevant patterns?
- What are the diachronic trajectories between the types we can identify?

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Languages

- Two closely related varieties of the Oghuz branch: Turkish and Azeri
- Phonetics: previous claims

  Turkish aspirated v. weakly/variably voiced (Kallestinova 2004)

  Azeri aspirated v. voiced (Ghaffarvand Mokari & Werner 2017)
- Phonology
  - Two-way contrast on the surface
  - Possibly more complex underlyingly (at least in Turkish)
- Likely extensive dialect variation

Phonological patterns

- Diachronic basis:
  - Voicing after V̄ but not V̆
  - Merger of V̄ > V̆
  - Coda devoicing (?)
  - Progressive devoicing
- Outcomes: ‘intervocalic voicing’ (e.g. Lewis 1967, Sezer 1981)

Turkish	*kaːp ‘covering’	*at ‘horse’	aːt ‘name’
NOM	*kap*	*at*	*ad*
3SG	*kabı*	*atı*	*adı*
PL	*kaplar*	*atlar*	*adlar*
ABL	*kaptan*	*attan*	*addan*
	|lenis|	|fortis|	|lenis+|

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- Diachronic basis:
  - Voicing after V̄ but not V̆
  - Merger of V̄ > V̆
  - Coda devoicing (?)
  - Progressive devoicing
- Outcomes: no final devoicing

Azeri	*kaːp 'covering'	*at 'horse'	aːt 'name'
NOM	*qab*	*at*	*ad*
3SG	*qabı*	*atı*	*adı*
PL	*qablar*	*atlar*	*adlar*
ABL	*qabdan*	*atdan*	*addan*
	|lenis|	|fortis|	|lenis|

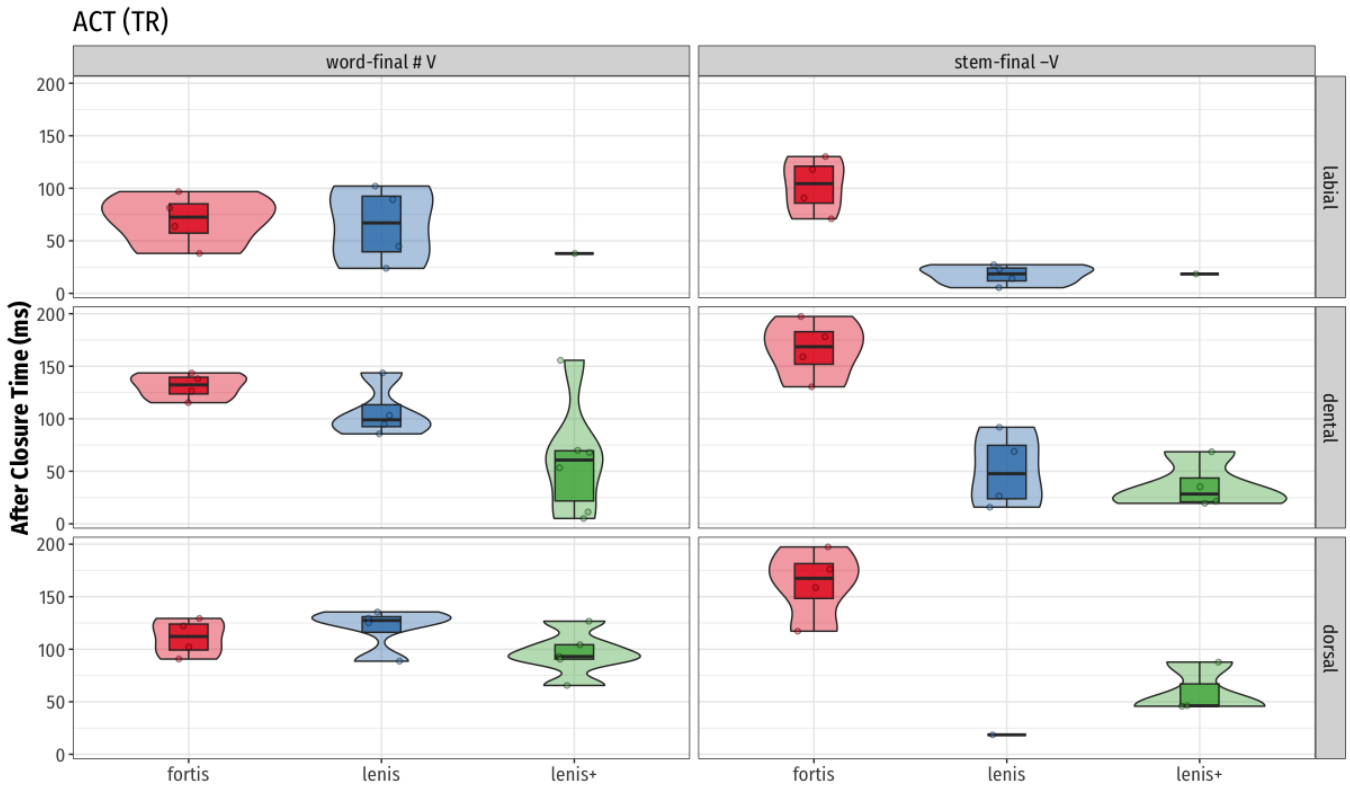
The experiment

- 3 (so far) speakers each
- Stem-final stops crossing these variables:
  - Expected category: |fortis|, |lenis|, |lenis+|
    - Hypothesised |lenis| and |lenis+| are orthographic (for now): *öd*, *rab*, *arkeolog* v. *şehit*, *sebep*, *ufak*.
  - Place: labial, coronal, (postalveolar), dorsal
  - Vowel backness: front, back
  - Position: word-internal, word-final phrase-internal, phrase-final
  - Following context: vowel, nasal, pause
- Set in frame sentences extracted from naturalistic corpora, presented in standard spelling
- 136 test sentences + controls (nasals) + (postalveolar) affricates, fricatives, and rhotic (beyond scope of talk).

Measurements

- Closure duration
- VOT
- Closure voicing
- F0 across following vowel

Post-release: Turkish



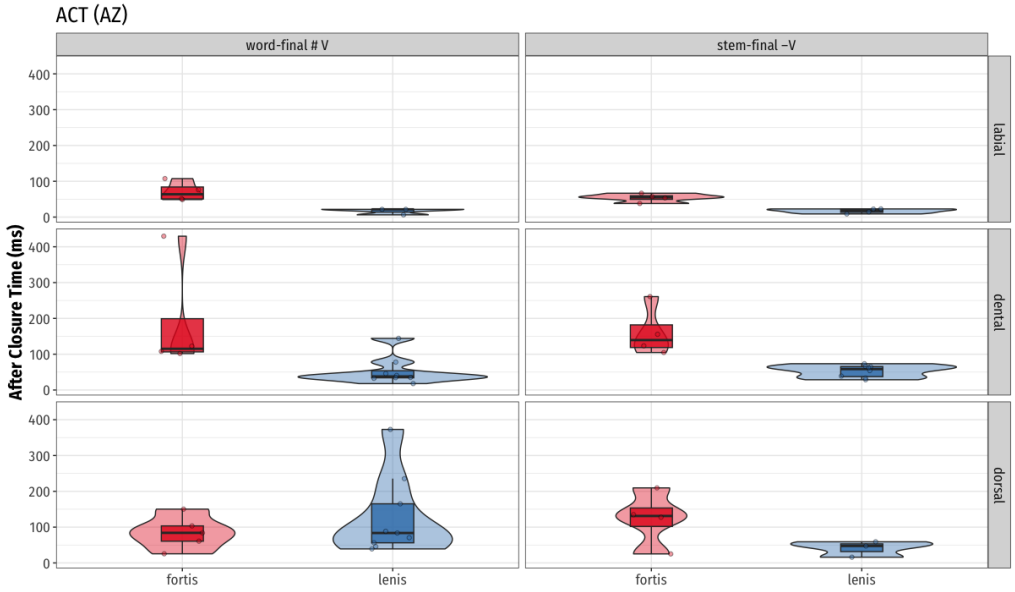
Expected aspirating type with final fortition, which |lenis+| escapes

|fortis| long-lag in all contexts

|lenis| short-lag word-medially, long-lag word-finally

|lenis+| short-lag in all contexts

Post-release: Azeri



Aspirating type, no final fortition

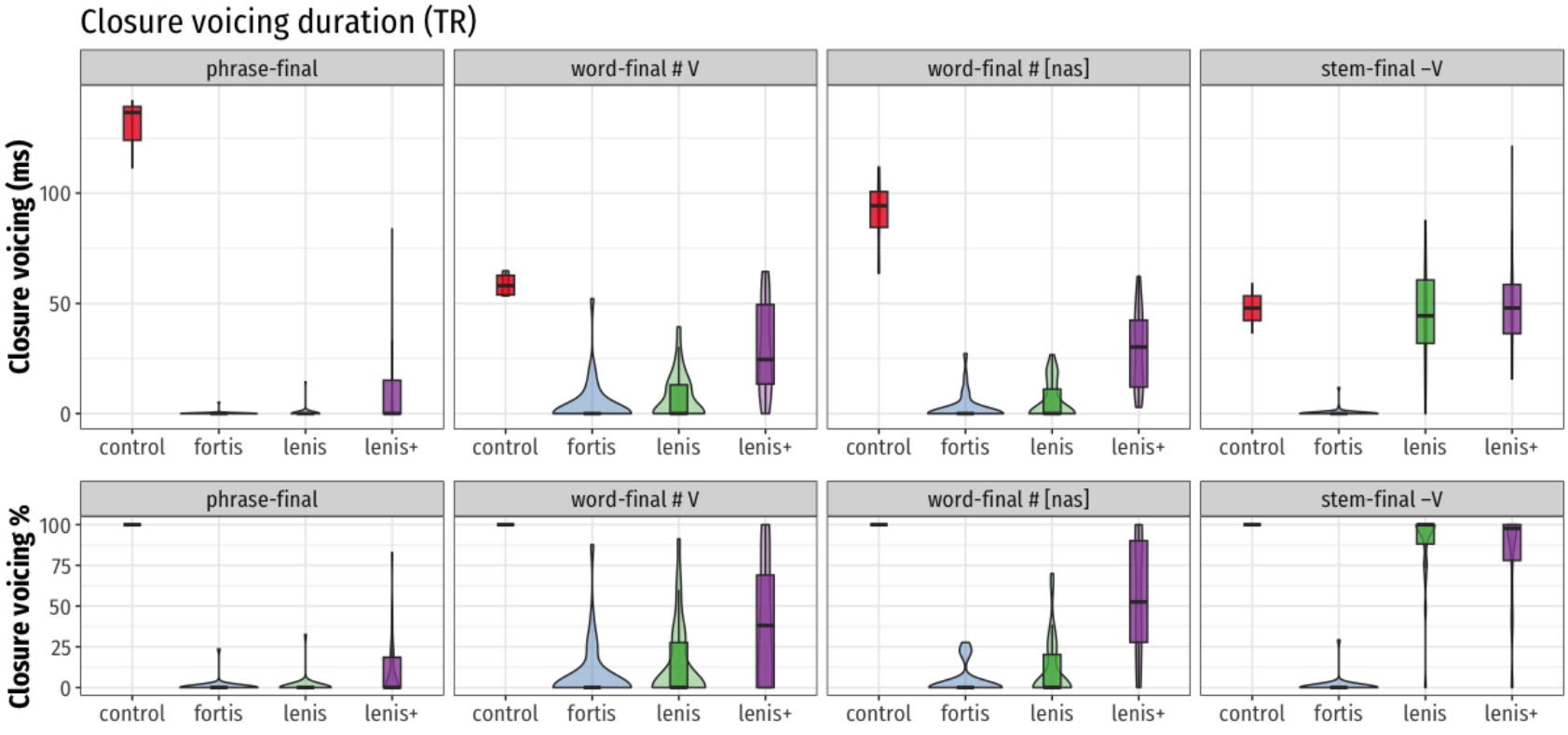
|fortis| long-lag

|lenis| short-lag

In fact: very extensive manner lenition (47 tokens → vfric, 35 → j, ∅)

- Some of it already stabilized: *göy* ‘blue’, *yox* ‘no’ v. Turkish *gök*, *yok*
- Also in our data: preaspiration, fricativization, affrication…

Closure voicing: Turkish



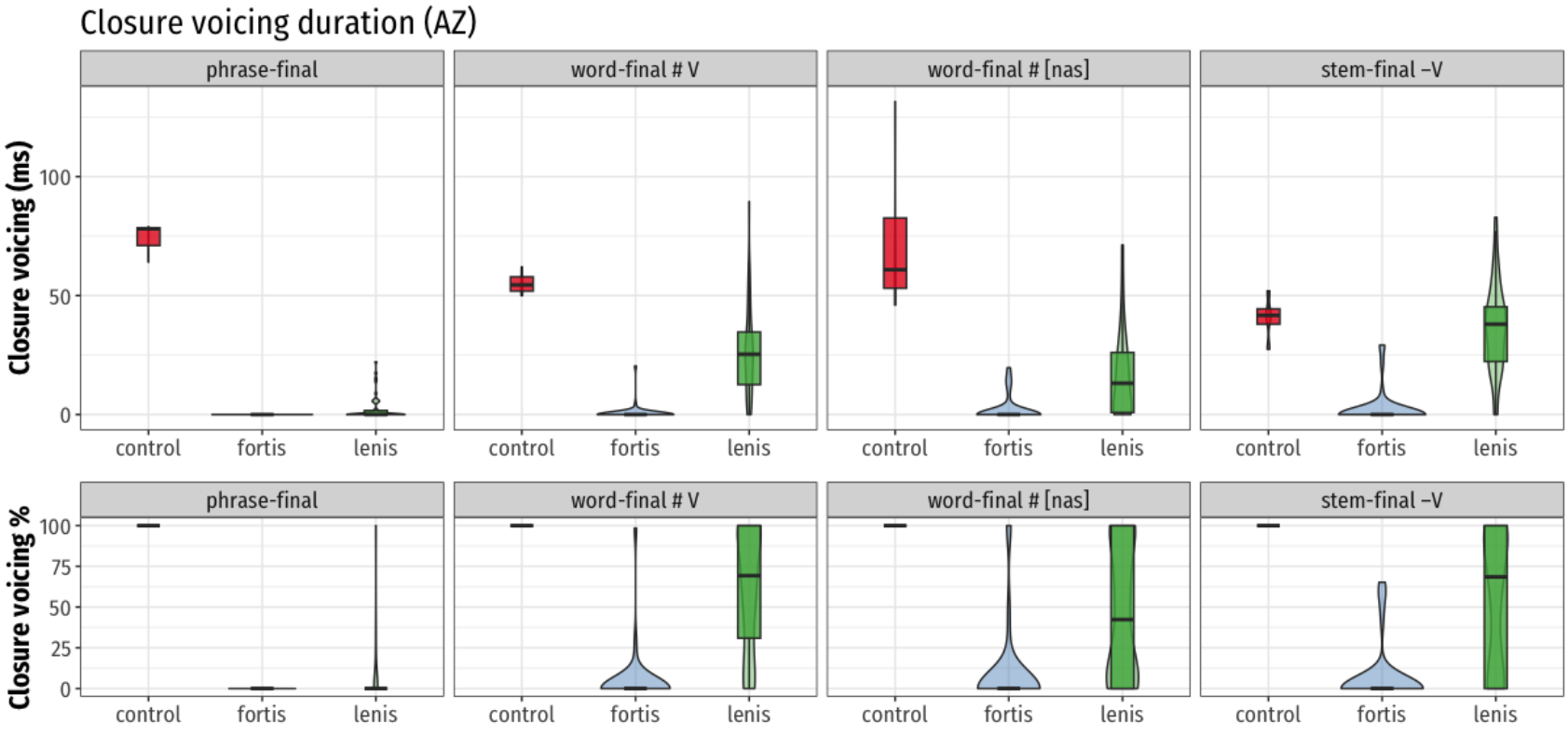
Expected aspirating type with final fortition, which |lenis+| is exempt from

|fortis| no voicing

|lenis| incomplete voicing word-medially, no voicing word-finally

|lenis+| incomplete voicing, even less phrase-finally

Closure voicing: Azeri



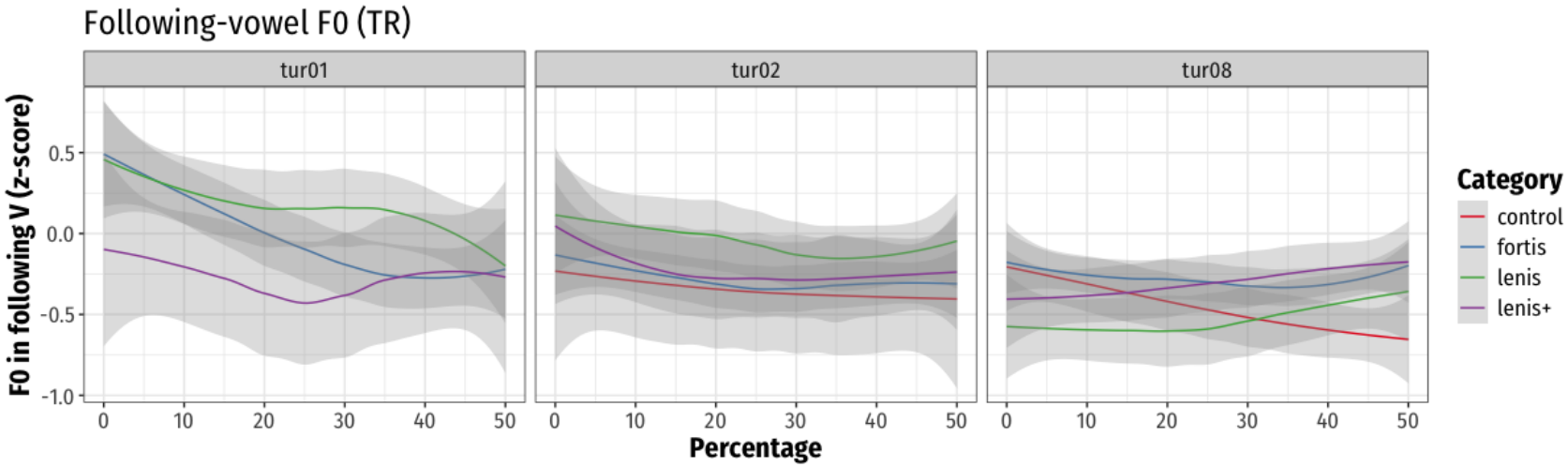
Aspirating type with no final fortition

|fortis| no voicing

|lenis| incomplete voicing, almost none phrase-finally

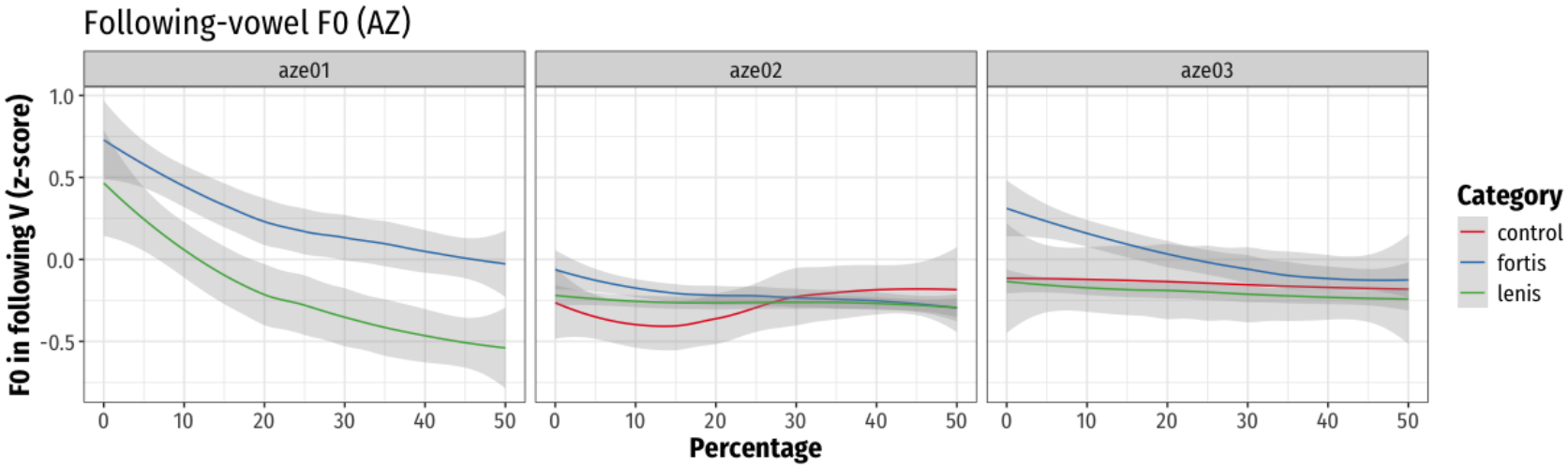
Voicing starts at the left edge, i.e. carries over from the preceding vowel.

F0 effect: Turkish



- No effect of stop category on F0 in following vowel
- Ask us about `tur01`

F0 effect: Azeri

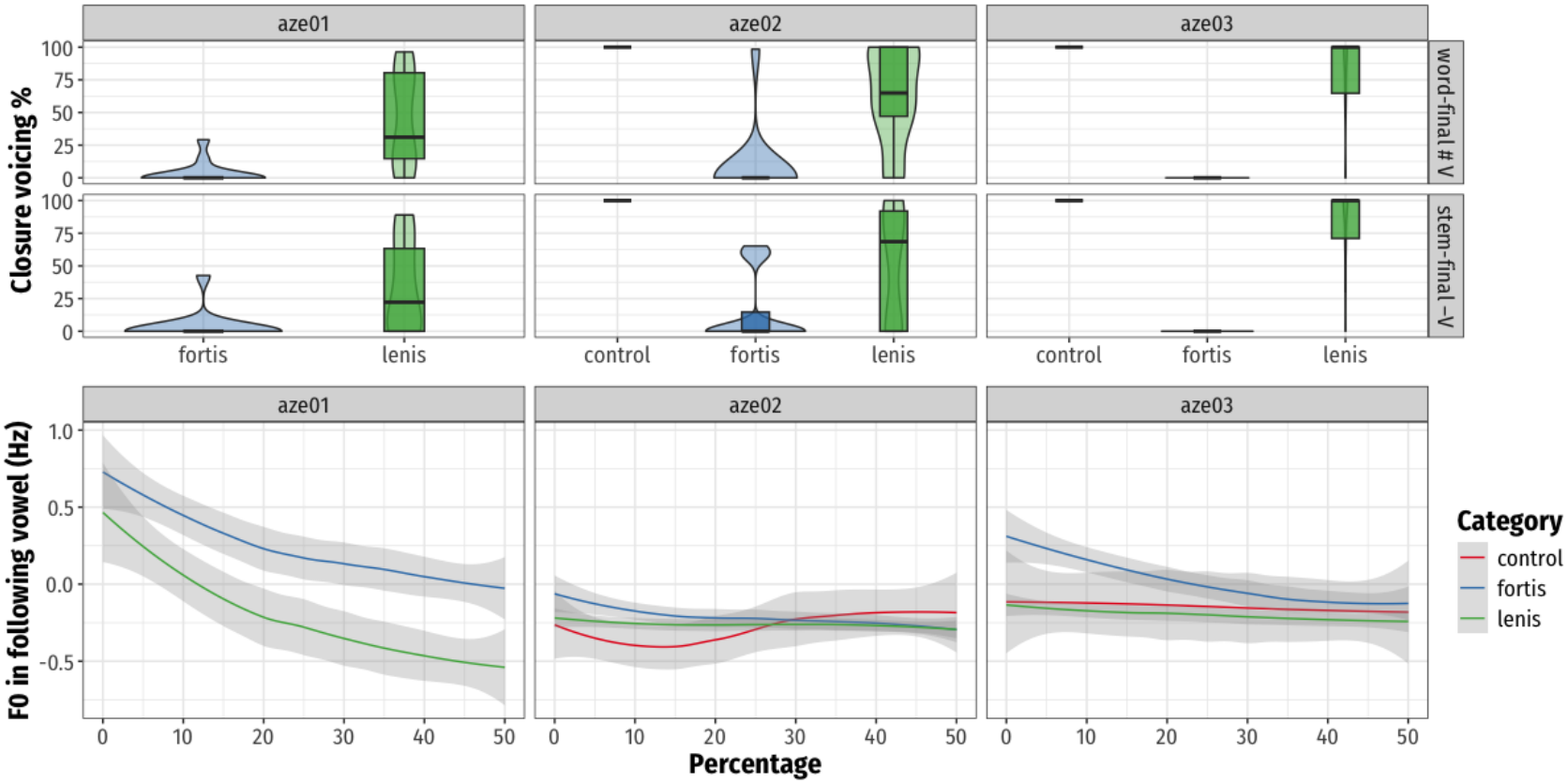


Robust effect of stop category comparable to other languages (Hanson 2009, Kirby & Ladd 2016, Kirby & Tan 2023)

|fortis| raised F0 relative to control (onset nasal)

|lenis| F0 similar to control

F0 effect: a closer look at Azeri



- No stance on whether effect is
  - F0 depressed by active voicing
  - F0 raised by the phonation of the |fortis| stops
- F0 effect independent of closure voicing (cf. Kirby & Tan [2023] for Swedish)

Analysis

- Overall, both languages are broadly in line with the ‘aspirating’ type
- Differences:

  Turkish final fortition of |lenis| stops, but not |lenis+| stops
  Contrast the traditional account with intervocalic voicing, which seems problematic

  Azeri no phonological rule of final fortition, but incomplete devoicing of |lenis| stops

- Azeri, but not Turkish, shows the F0 effect

Phonological architecture and the life cycle

- Proposed analysis within the life cycle model (Bermúdez-Otero 2015)
  - F0 effect has phonologized to a phonetic rule in Azeri, but not in (most of) Turkish
  - Phonologized positional devoicing of |lenis| stops in Azeri, stabilized in Turkish

Stage	Turkish	Azeri
Mechanical effect	F0	
Phonologization		F0, final fortition
Stabilization	Final fortition	

Discussion

Our results v. previous findings

- |fortis| stops are aspirated in both Turkish and Azeri
- Turkish
  - Prototypical ‘aspirating’ language with partial voicing of |lenis| stops
  - |lenis| stops undergo neutralizing coda devoicing, |lenis+| stops do not
- Azeri
  - Extensive manner lenition in codas
  - Variation in the voicing of |lenis| stops
  - Coda devoicing exists, but is non-neutralizing
  - F0 effect can be present even where closure voicing is weak

Diachronic interpretation

1. Prototypical aspirating system, perhaps with a phonetic version of coda devoicing
2. Turkish
    - More consistent late timing of glottal opening in |fortis|
    - Stabilization of coda devoicing
    - Split of the old |lenis| category
3. Azeri
    - No stabilization of coda devoicing
    - More variable timing of glottal opening in |fortis|
    - Some varieties: decrease in closure voicing — but the phonologized F0 effect persists

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Diachronic typology

- Disaggregating developments into steps along the life cycle gives us a way to approach microvariation across both phonetic rules and phonological patterns
- If the F0 effect is driven by active voicing, Azeri shows how phonologization emancipates phonetic-phonological patterns from their substantive grounding
- Tentative reconstruction: diachronic development from classic 'aspirating' systems towards those with no voicing at all
- Endogenous development perfectly in line with the life cycle: what would appealing to contact add?

Summary

- Microvariation in phonological and phonetic patterns across Oghuz
  - Generally ‘aspirating’ type
  - Different status of final fortition
  - F0 effect in Azeri but not in Turkish
- The architecture of the life cycle helps us reconstruct internal trajectories
- More informed approach to evaluating contact hypotheses

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- The architecture of the life cycle helps us reconstruct internal trajectories
- More informed approach to evaluating contact hypotheses

Summary

- Microvariation in phonological and phonetic patterns across Oghuz
  - Generally ‘aspirating’ type
  - Different status of final fortition
  - F0 effect in Azeri but not in Turkish
- The architecture of the life cycle helps us reconstruct internal trajectories
- More informed approach to evaluating contact hypotheses

Teşekkür ederiz!

Təşəkkür edirik!

{deepthi.gopal, laszlo.karoly}@lingfil.uu.se

{stephen.nichols, pavel.iosad}@ed.ac.uk

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