Hungarian VA Non-Categorically Speaking

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Overview

- Introduction: the Hungarian obstruent system

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- The phonological analysis of regressive voicing assimilation (RVA)

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- Phonetic ramifications of phonological analyses
- The experiment
- Conclusions and implications

The Hungarian obstruent system

	Labial	Alveolar	Postalveolar	Palatal	Velar
Plosive	p b	t d		c ɟ	k g
Affricate		t͡s (d͡z)	t͡ʃ d͡ʒ		
Fricative	f v	s z	ʃ ʒ		

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/naːd/	[naːd] *[naːt]	‘reed’
/raːg/	[raːg] *[raːk]	‘he chews’
/laːz/	[laːz] *[laːs]	‘temperature’
/laːɟ/	[laːɟ] *[laːc]	‘soft’

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/kɔlɔp/+ /bɔn/	[kɔlɔbːɔn]	‘in (a) hat’
/fyːc/+ /bɔn/	[fyːɟbɛn]	‘in (a) whistle’
/seːp/+ /zɛneːs/	[seːbzɛneːs]	‘beautiful musician’
/vɔk/+ /zɛneːs/	[vɔgzɛneːs]	‘blind musician’

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/rɔb/+ /toːl/	[rɔptoːl]	‘from (a) prisoner’
/aːɟ/+ /toːl/	[aːctoːl]	‘from (a) bed’
/hɔb/+ /sifon/	[hɔpsifon]	‘cream-maker’
/hɔd/+ /ʃɛrɛg/	[hɔtʃɛrɛg]	‘army’

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$$\begin{bmatrix} \text{-son} \\ -\alpha\text{voice} \end{bmatrix} \rightarrow [\alpha\text{voice}]/\_\_ \begin{bmatrix} \text{-son} \\ \alpha\text{voice} \end{bmatrix}$$

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UR	[-voice] + [+voice]	/k/ + /d/	/k/ + /z/	/g/ + /z/
RVA	[+voice][+voice]	/gd/	/gz/	N/A
Surface	[+voice][+voice]	[gd]	[gz]	[gz]

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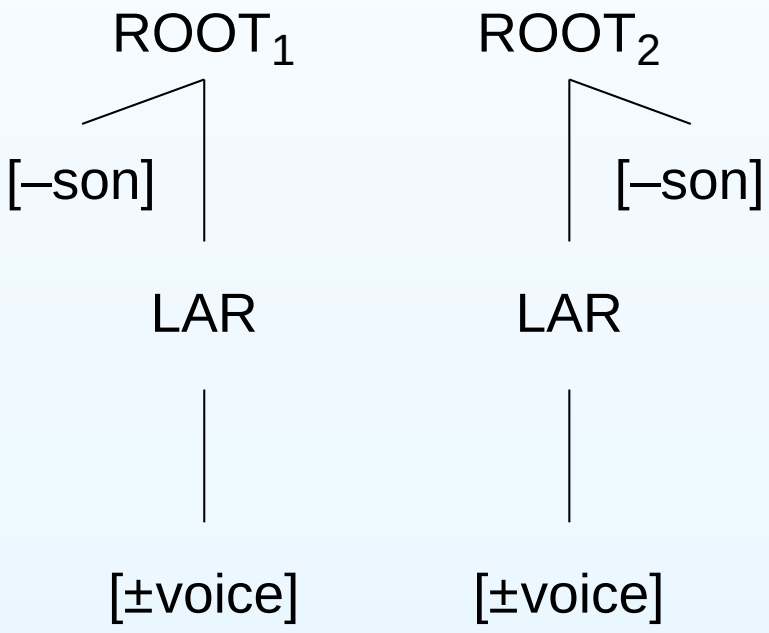

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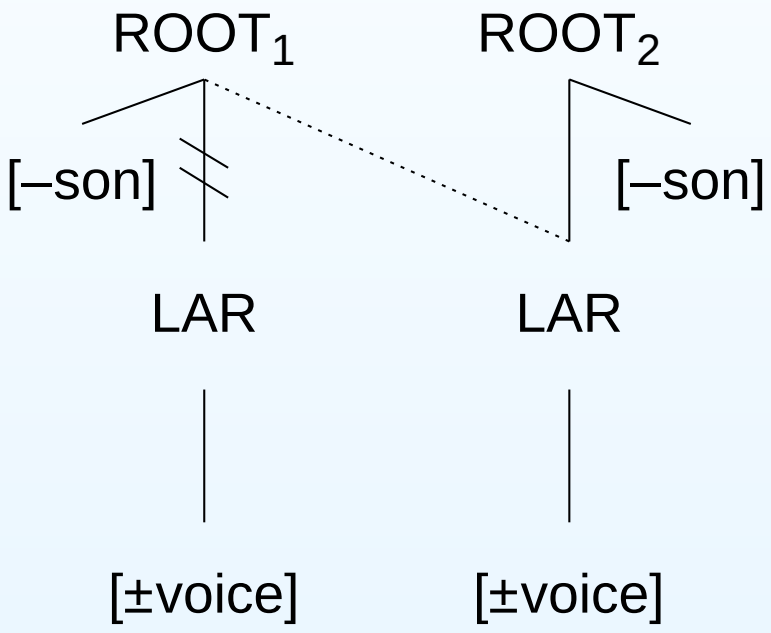

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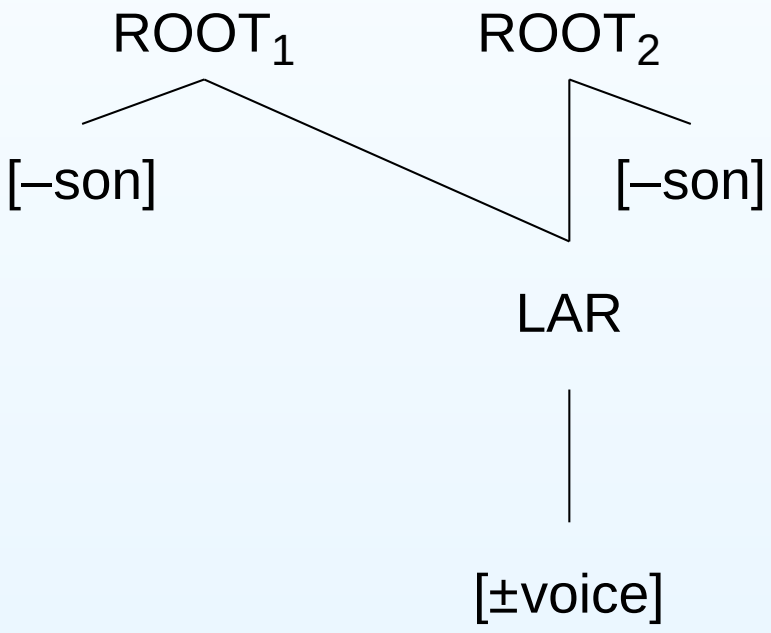

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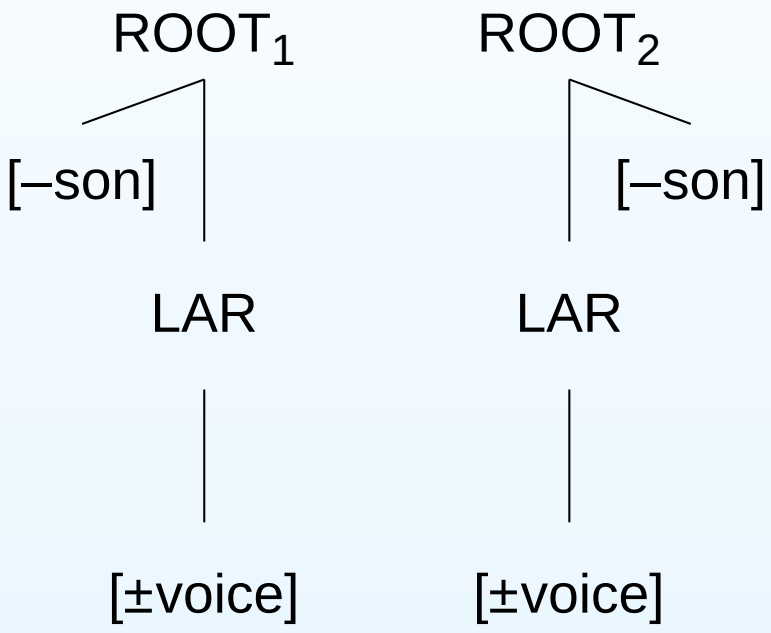

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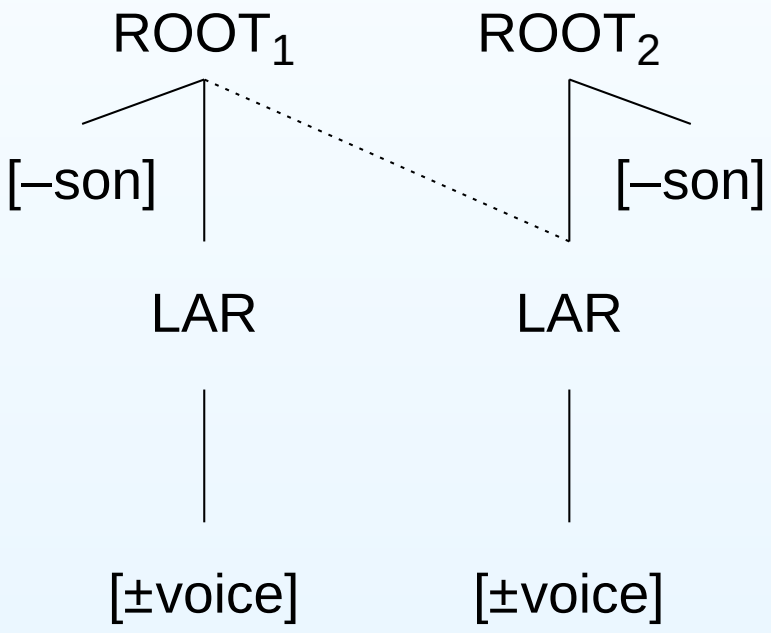

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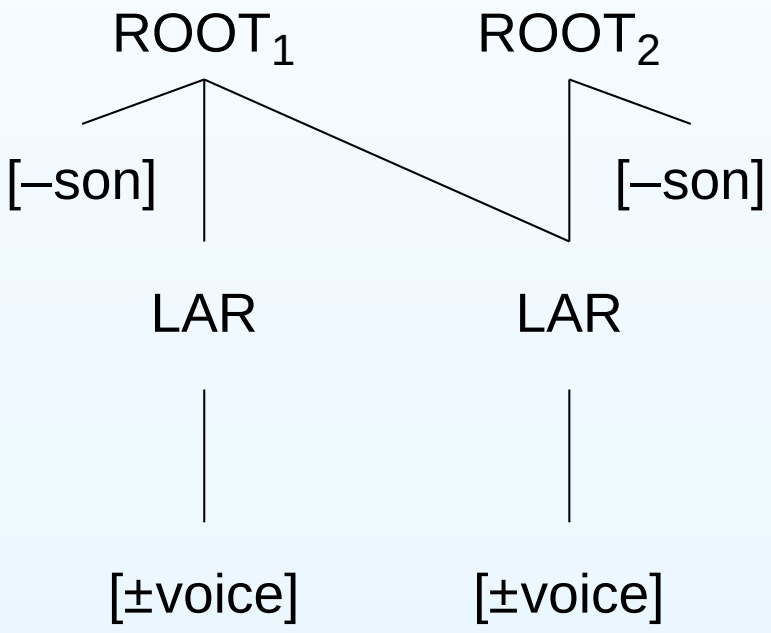

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- If RVA is phonologically neutralising: RVA is phonetically neutralising too

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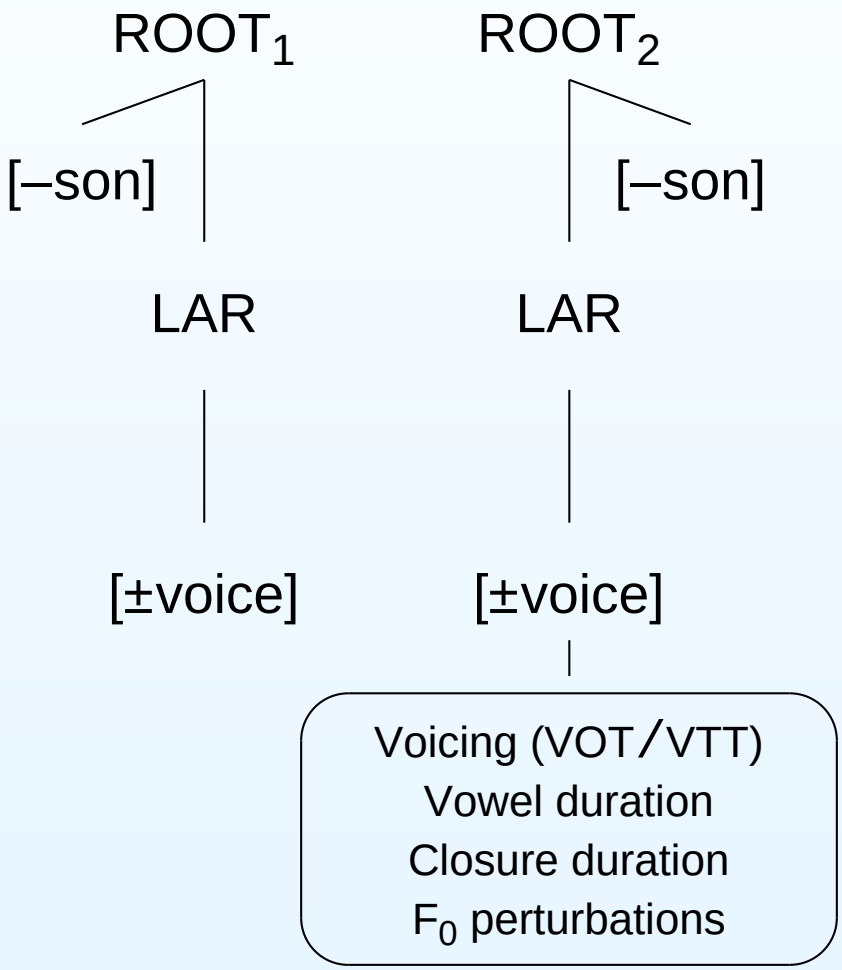

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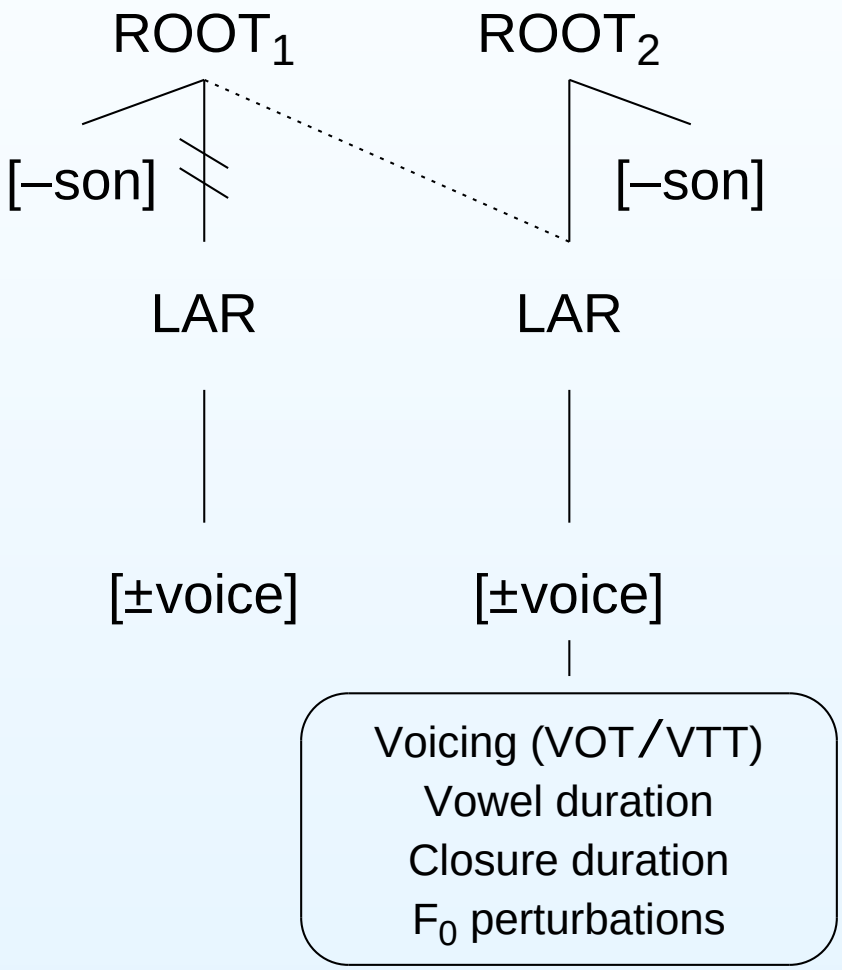

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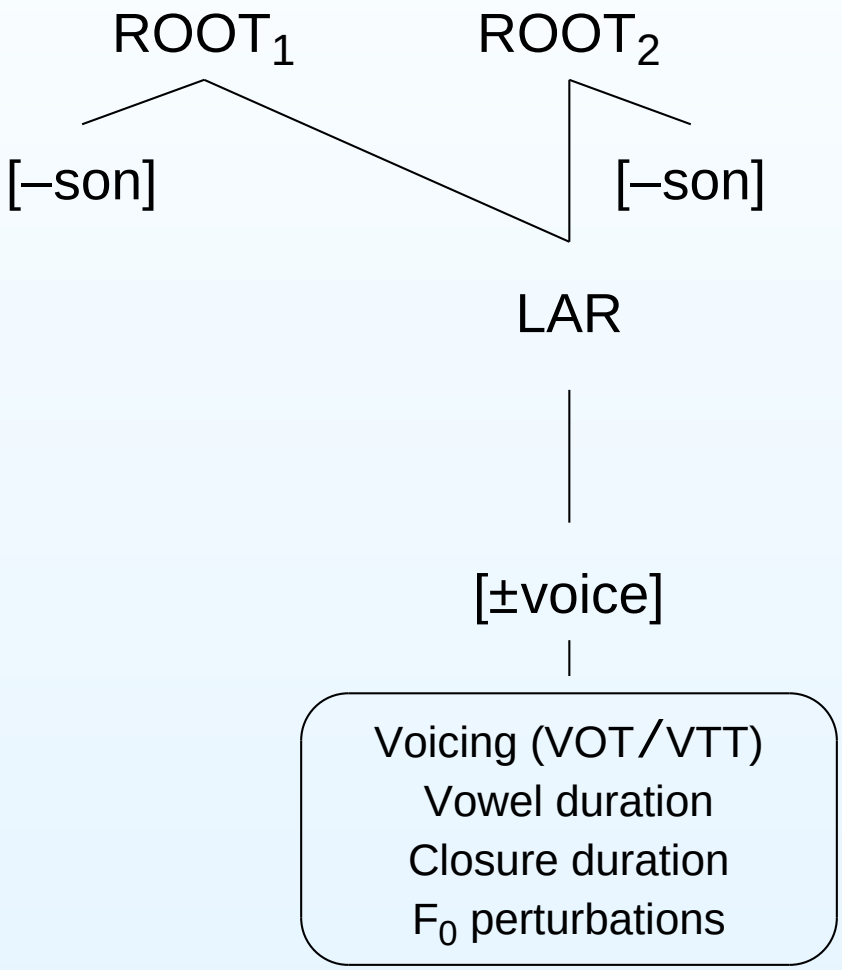

Modelling RVA - 2

- An alternative approach is to express RVA as an operation on a lexically redundant [voice] feature (cf. Hubers & Kooij 1973; Brink 1975)), or as the coarticulation of phonetic gestures related to the production of voicing contrasts (Ernestus 2000; Jansen 2001, submitted)

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- As a SPE-style rewrite rule:

$$\begin{bmatrix} \text{-son} \\ \beta\text{tense} \\ -\alpha\text{voice} \end{bmatrix} \rightarrow [\alpha\text{voice}]/\_\_ \begin{bmatrix} \text{-son} \\ \gamma\text{tense} \\ \alpha\text{voice} \end{bmatrix}$$

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RVA	$\begin{bmatrix} +\text{tense} \\ +\text{voice} \end{bmatrix} \begin{bmatrix} -\text{tense} \\ +\text{voice} \end{bmatrix}$	/k͡d/	/k͡z/	N/A
Surface	$\begin{bmatrix} +\text{tense} \\ +\text{voice} \end{bmatrix} \begin{bmatrix} -\text{tense} \\ +\text{voice} \end{bmatrix}$	[k͡d]	[k͡z]	[gz]

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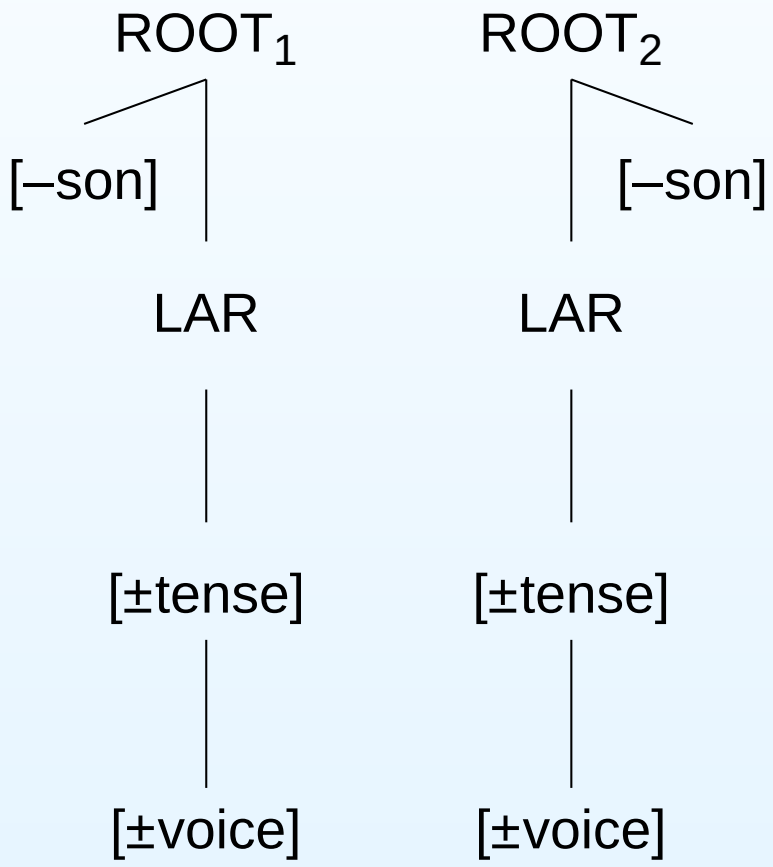

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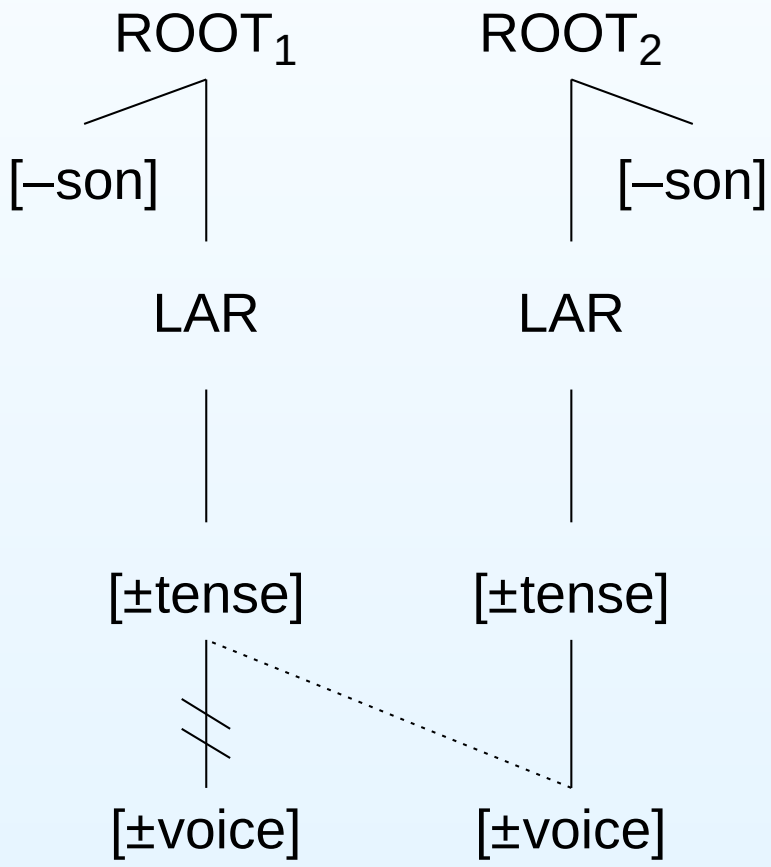

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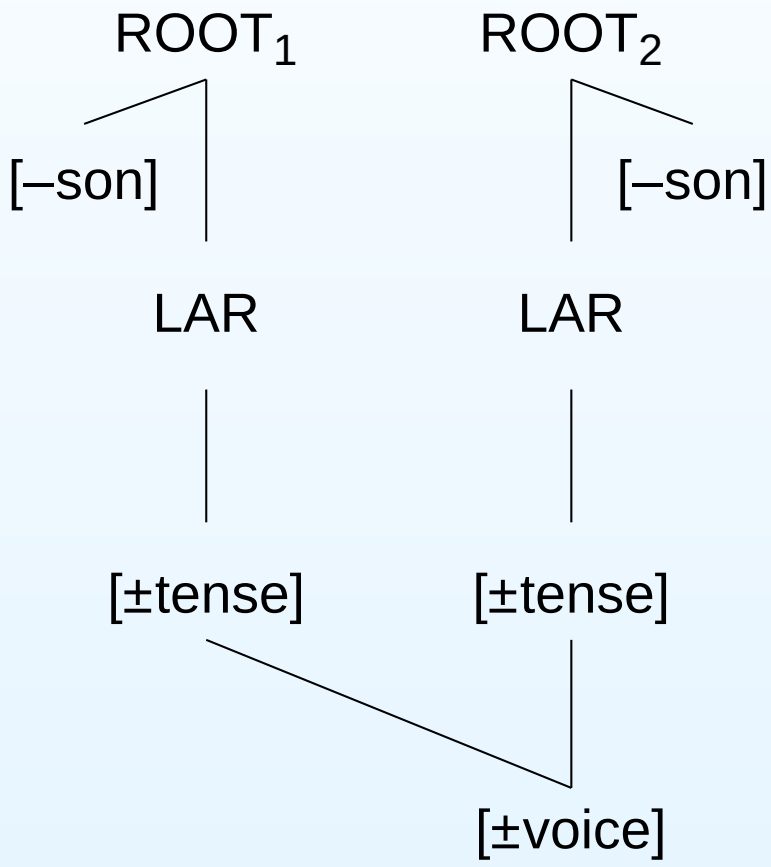

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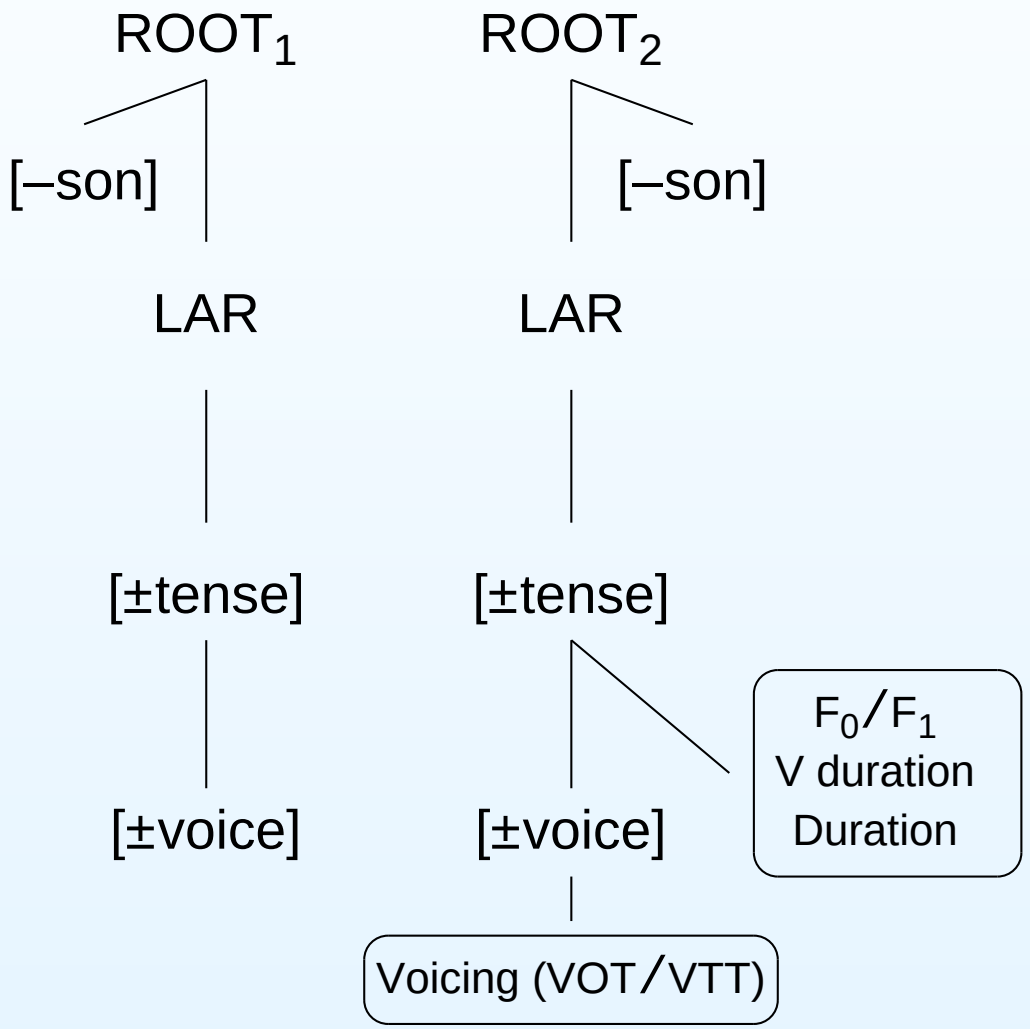

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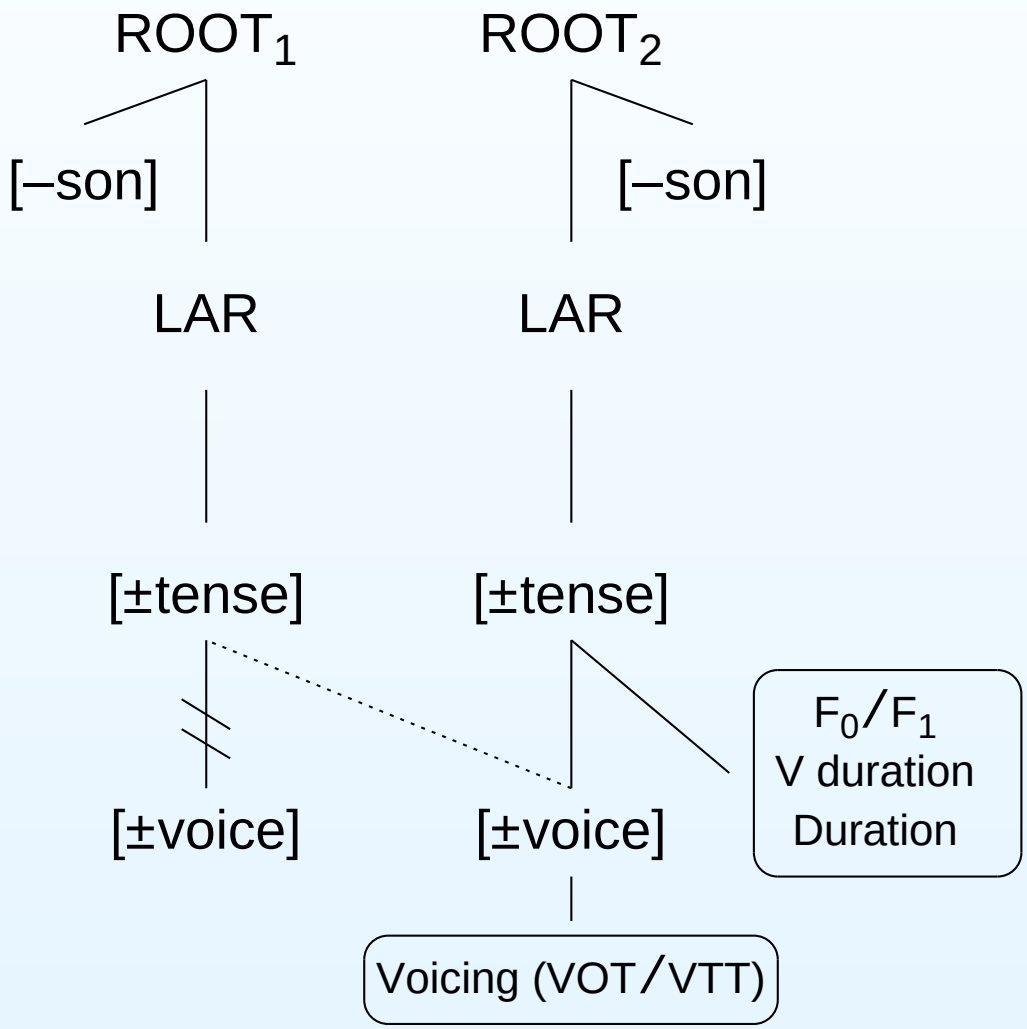

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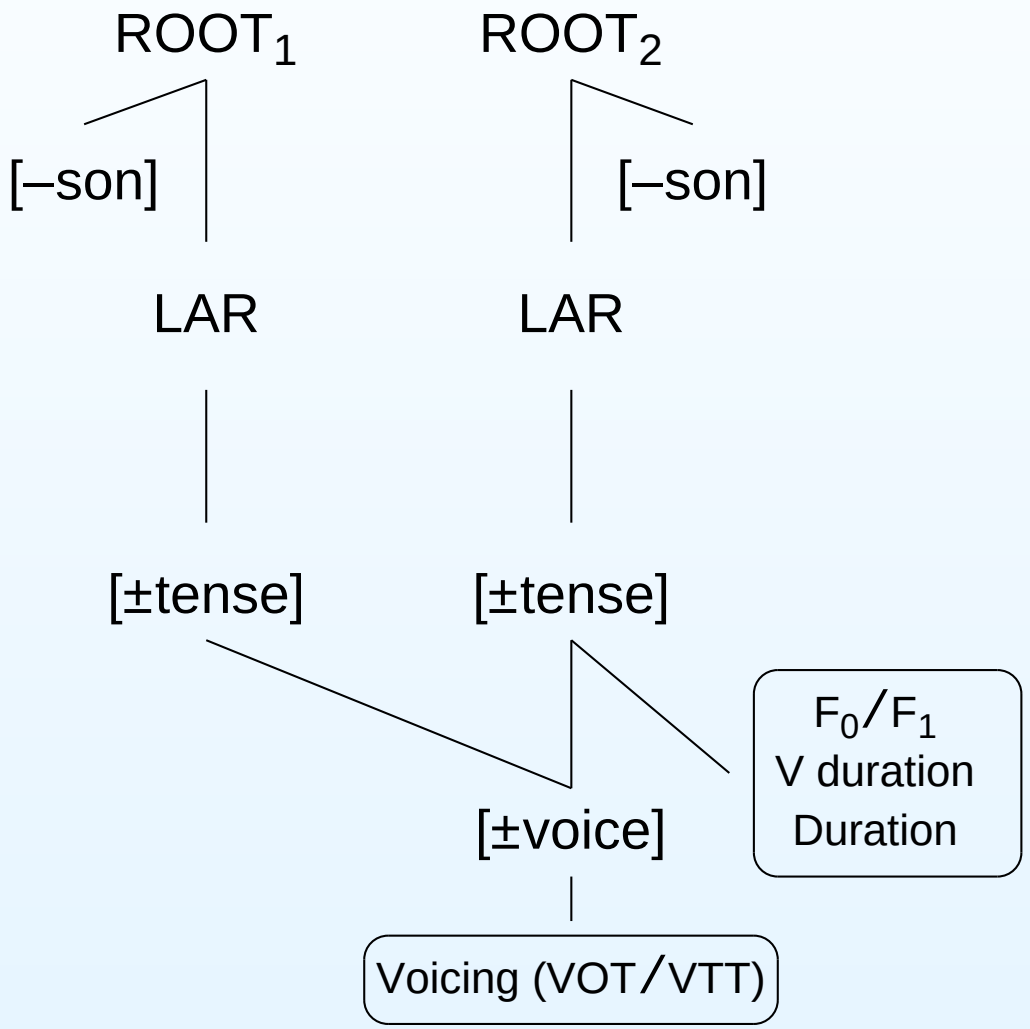

Methods: subjects

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- Various degrees of profiency in various other languages; 1 speaker was a Hungarian/Slovak bilingual

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- 20 permutations of C_1 * C_2
- 2 (plosive C_1) * 5 (C_2) * 6 (stimuli) + 2 (fricative) C_1) * 5 (C_2) * 4 (stimuli) = 100 stimuli

Methods: materials

- Sample stimuli:

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A	*vak*	*darabolta*	*a*	*húst*
/ɔ	vɔk	dɔrɔboltɔ	ɔ	huːʃt/
The	blind	minced	the	meat

‘The blind man minced the meat’

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‘The blind man minced the meat’

A	*rizs*	*zöldül*	*a*	*mezőn*
/ɔ	riʒ	zøldyl	ɔ	mezøːn/
The	rice	green-become	the	fields-LOC.

‘The rice turns green in the fields’

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- . . . leaving 953 utterances for analysis

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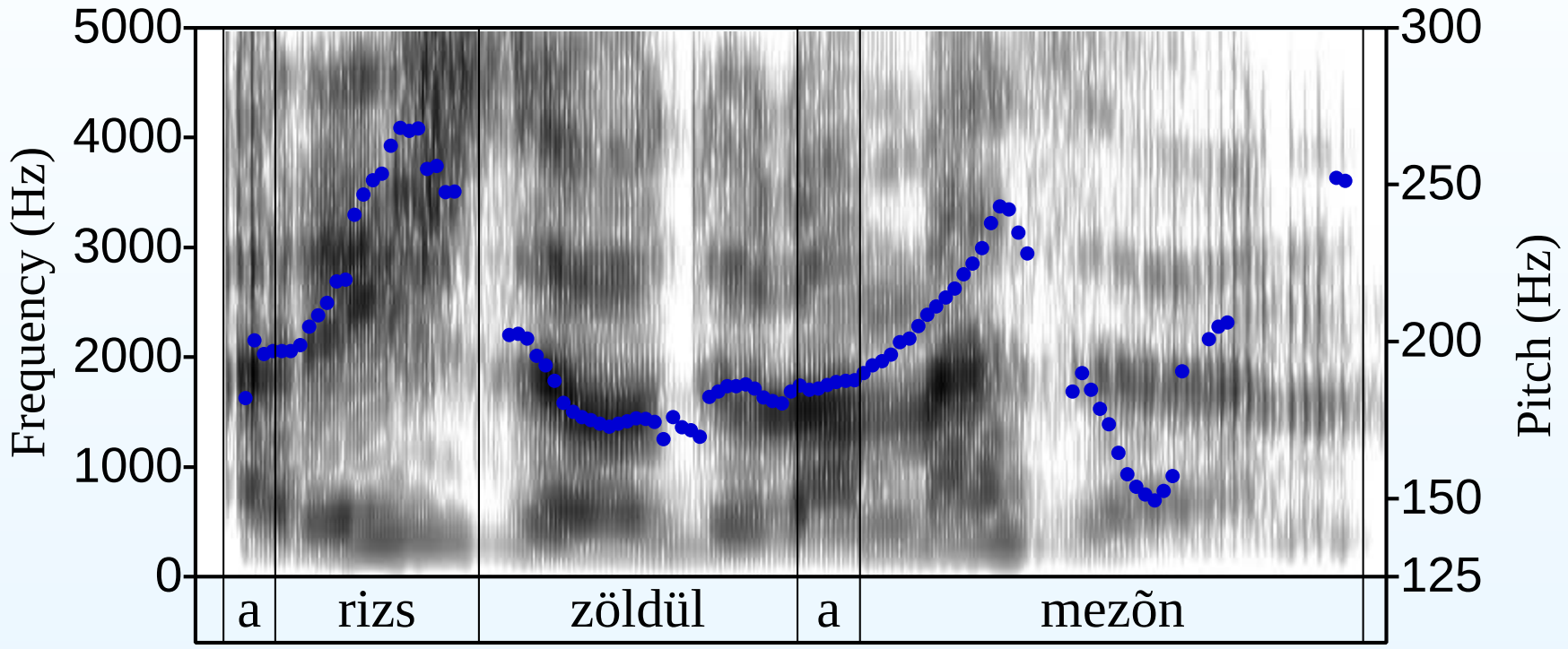
- Sometimes there was a secondary accent on the initial syllable of the final word

Methods: procedure



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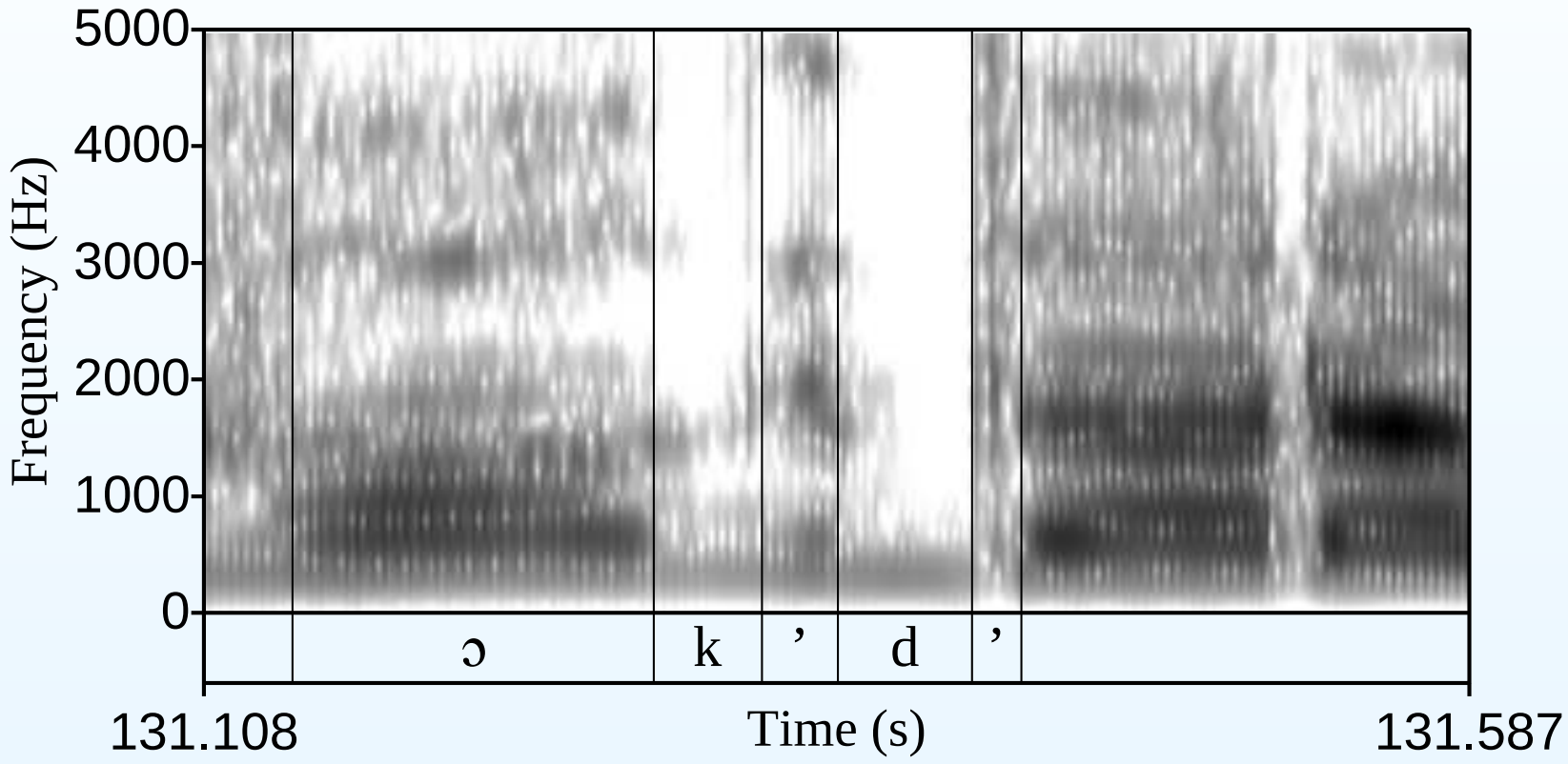

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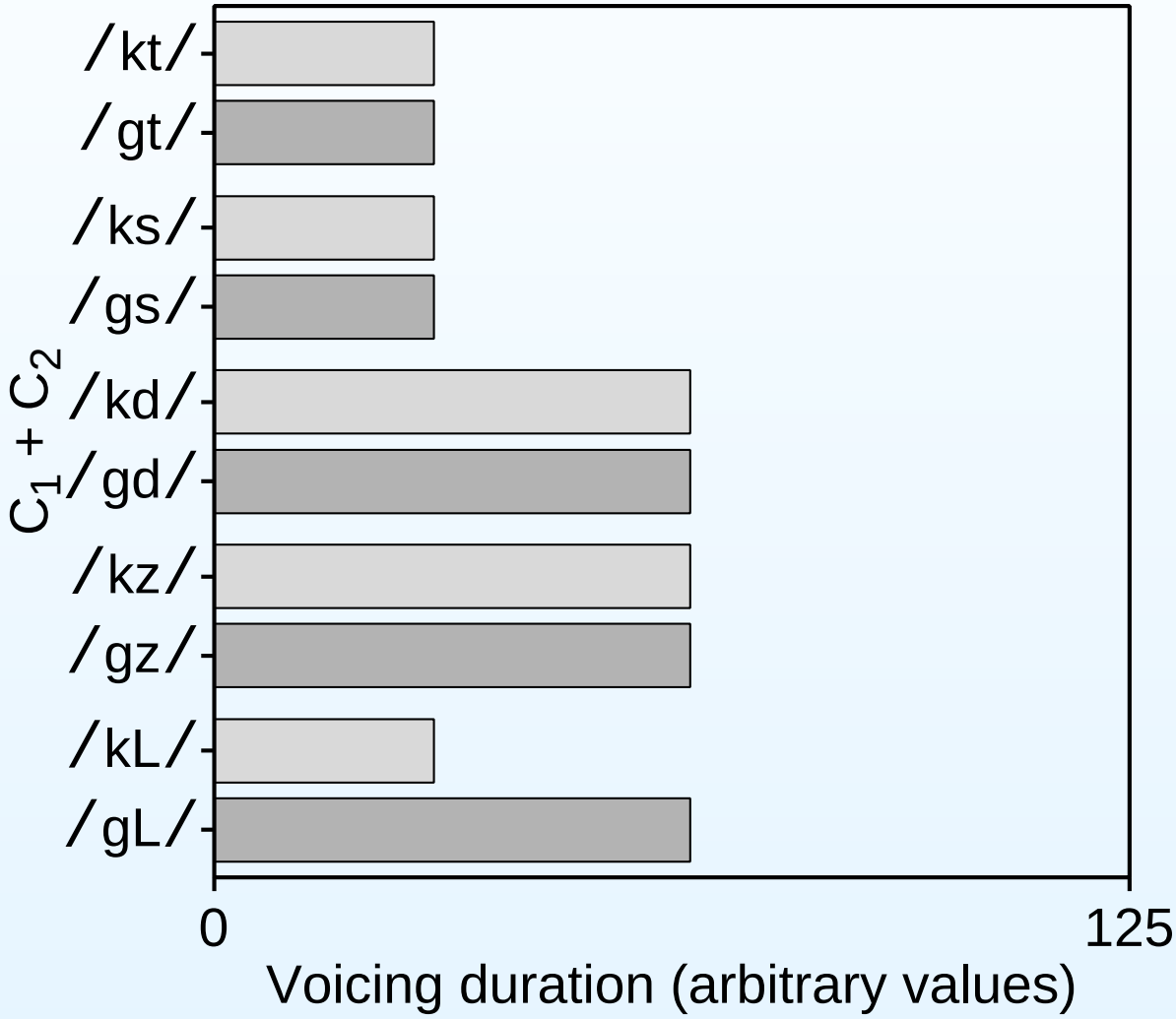

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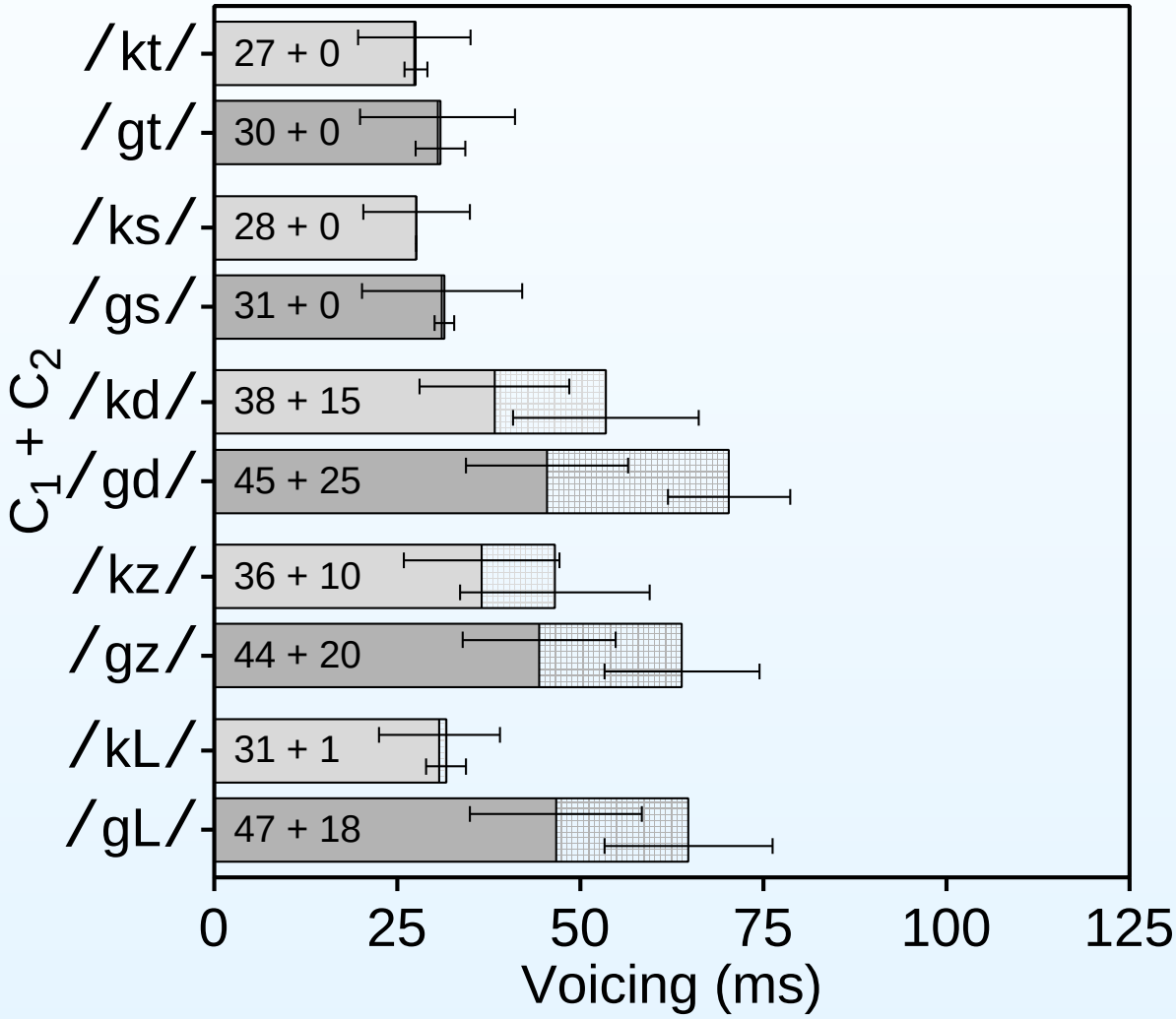

C_1 voicing: results

- Two-way ANOVA results for C_1 overall voicing (plosive C_1, baseline pre-liquid environment excluded)

Factor	
C_1 Laryngeal specifi cation	$F(1,531) = 77.70$, $p < .001$
C_2 Laryngeal specifi cation	$F(1,531) = 623.04$, $p < .001$
C_1 Lar. spec. * C_2 Lar. spec.	$F(1,531) = 33.16$, $p < .001$

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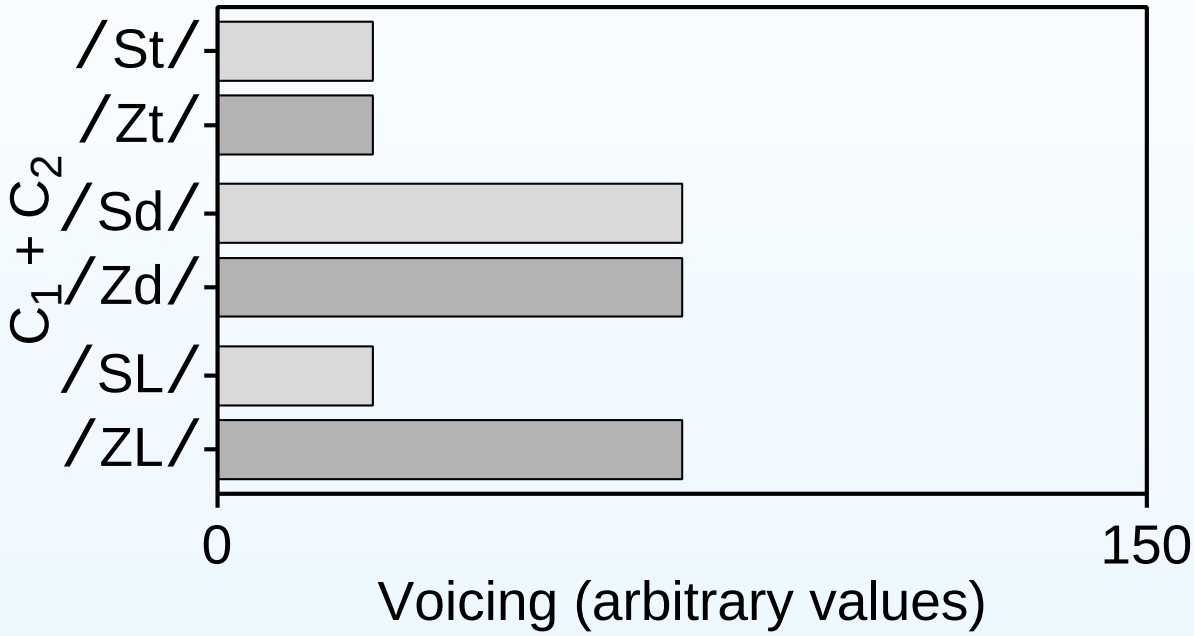

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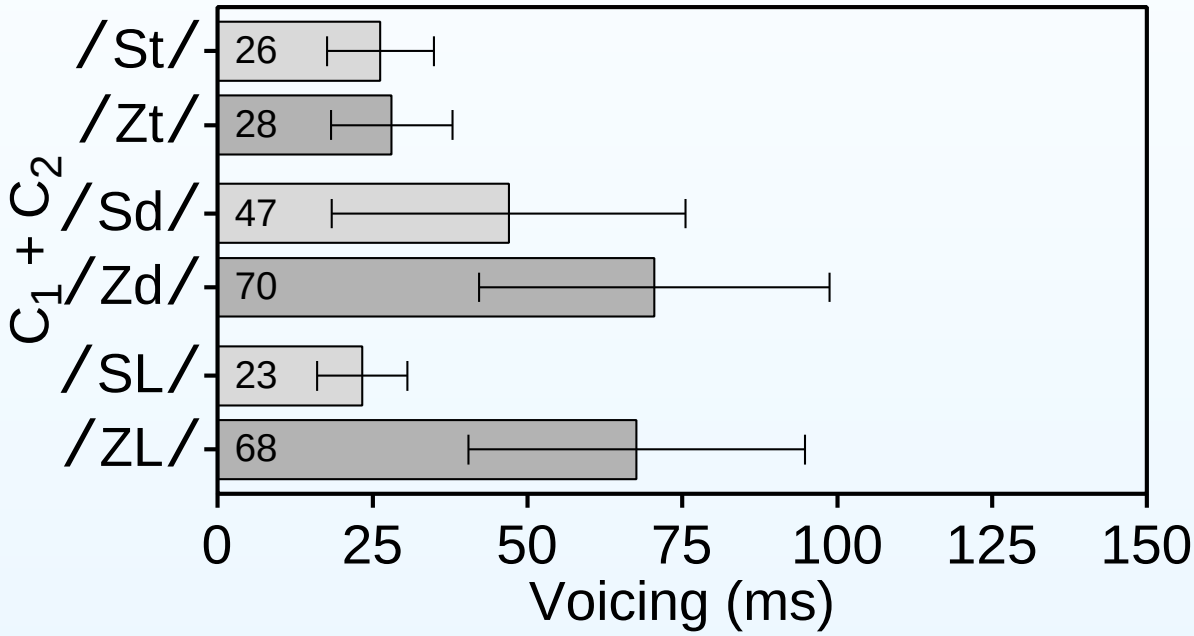

C_1 voicing: results

- Two-way ANOVA results for C_1 overall voicing (fricative C_1, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	$F(1,184) = 17.28$, $p < .001$
C_2 Laryngeal specifi cation	$F(1,184) = 107.52$, $p < .001$
C_1 Lar. spec. * C_2 Lar. spec.	$F(1,184) = 12.63$, $p < .001$

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- However, this effect is not completely neutralising:
  - before phonologically voiced obstruent /k/ and /g/ and /ʃ/ and /ʒ/ remain distinct

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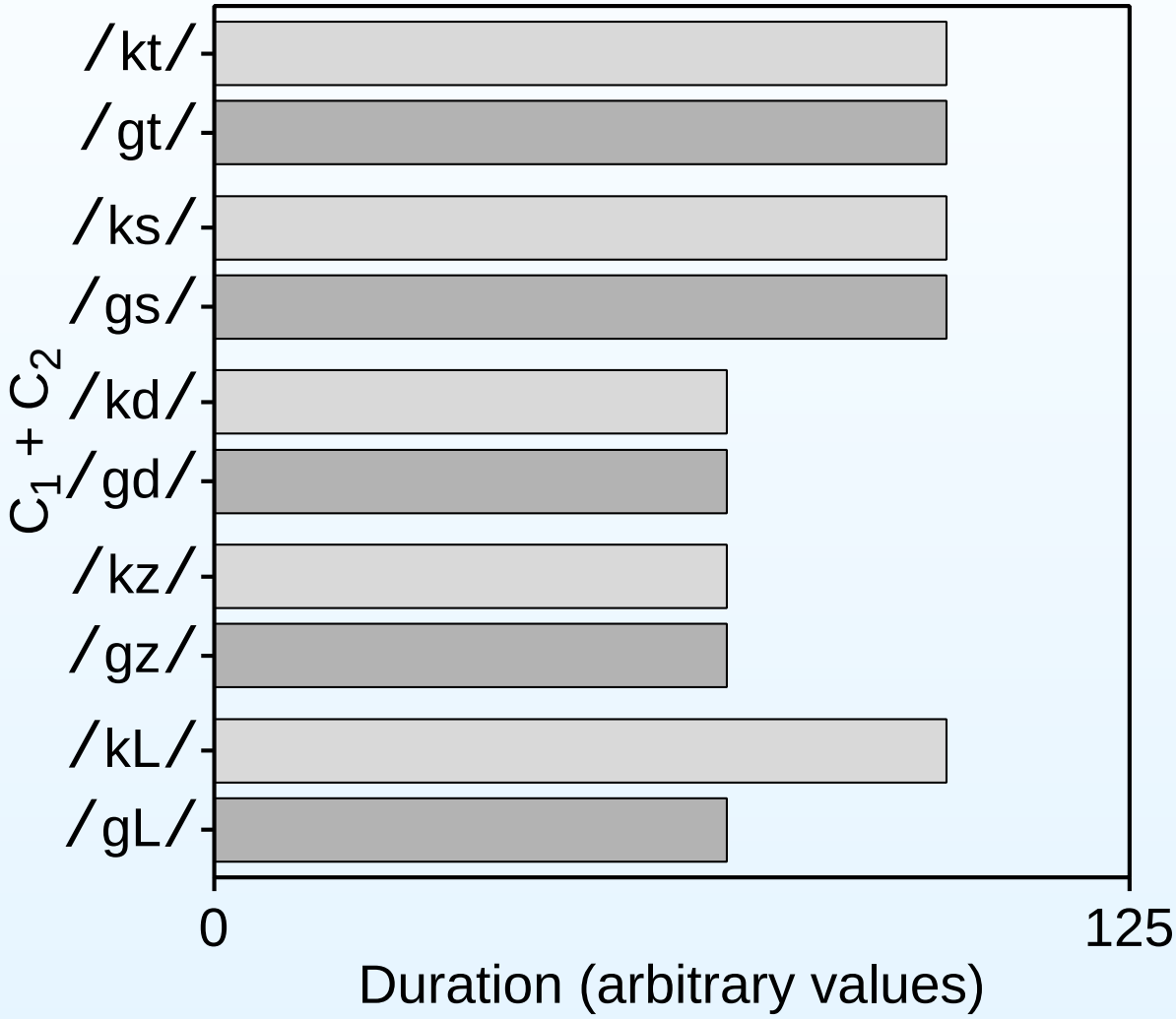

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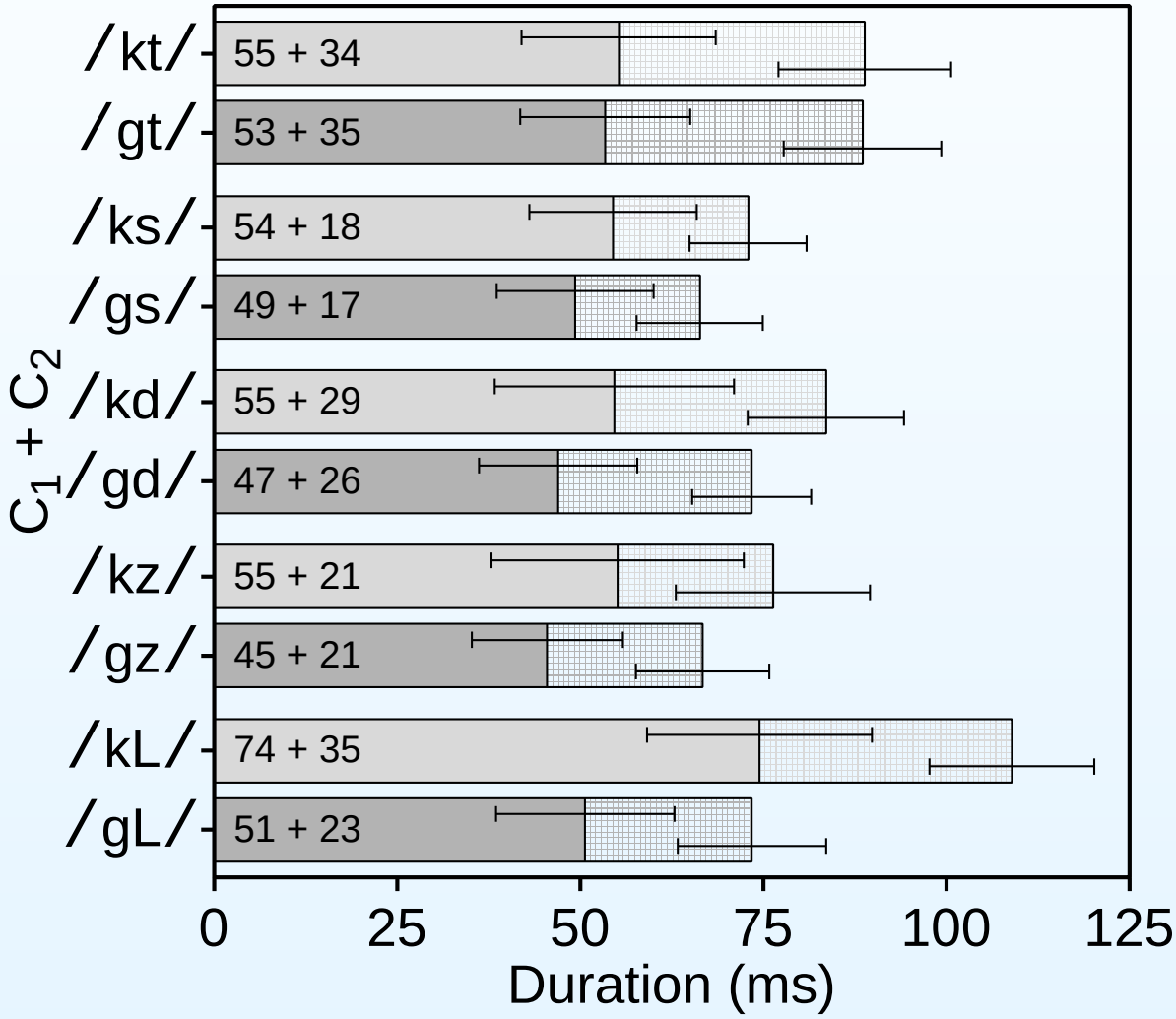

C_1 duration: results

- Two-way ANOVA results for C_1 closure duration (plosives, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	$F(1,531) = 30.03$, $p < .001$
C_2 Laryngeal specifi cation	$F(1,531) = 5.34$, $p < .025$
C_1 Lar. spec. * C_2 Lar. spec.	$F(1,531) = 5.51$, $p < .02$

C_1 duration: results

- Two-way ANOVA results for C_1 release duration (plosives, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	F(1,260) = .123, n.s.
C_2 Laryngeal specifi cation	F(1,260) = 27.60, $p < .001$
C_1 Lar. spec. * C_2 Lar. spec.	F(1,260) = 2.40, n.s.

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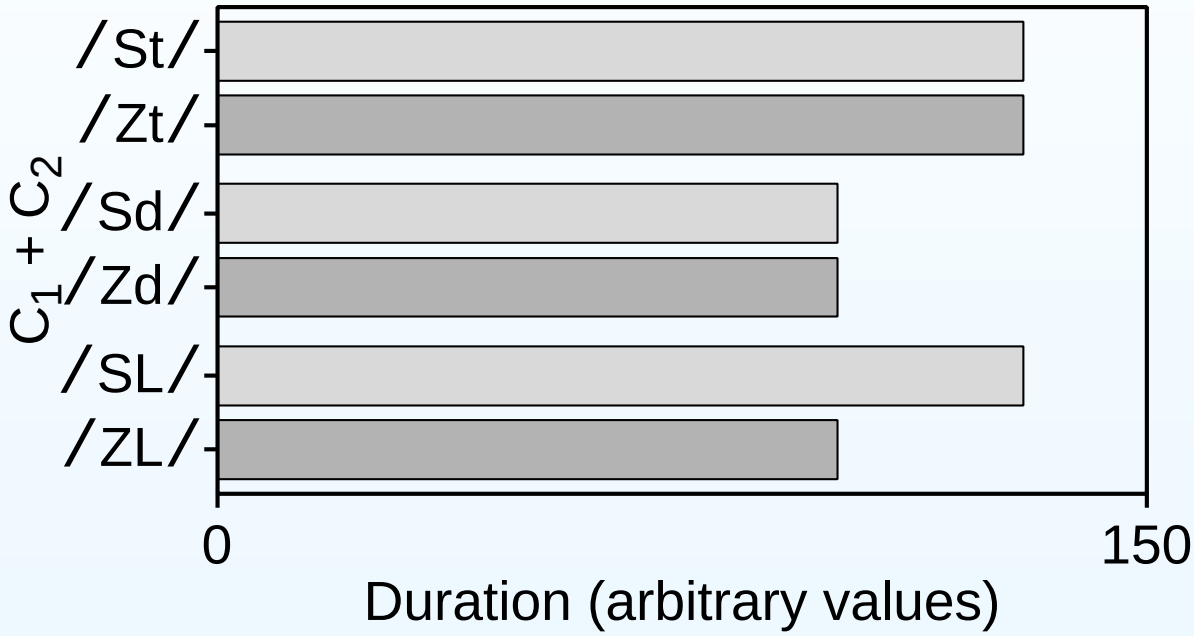
- In addition, C_1 closure duration appears to preserve the underlying contrast between /k/ and /g/
- There does seem to be a (neutralising) assimilatory effect on C_1 release duration before a following plosive

C_1 duration: predictions



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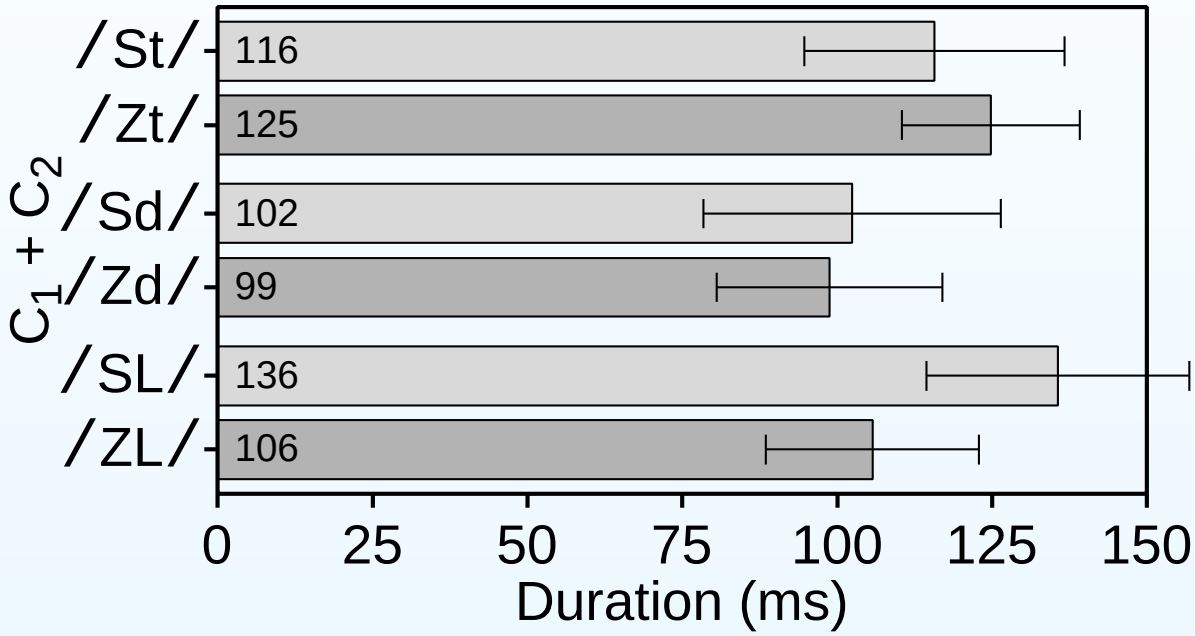

C_1 voicing: results

- Two-way ANOVA results for C_1 duration (fricatives, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	F(1,184) = .938, n.s.
C_2 Laryngeal specifi cation	F(1,184) = 46.74, $p < .001$
C_1 Lar. spec. * C_2 Lar. spec.	F(1,184) = 4.92, $p < .03$

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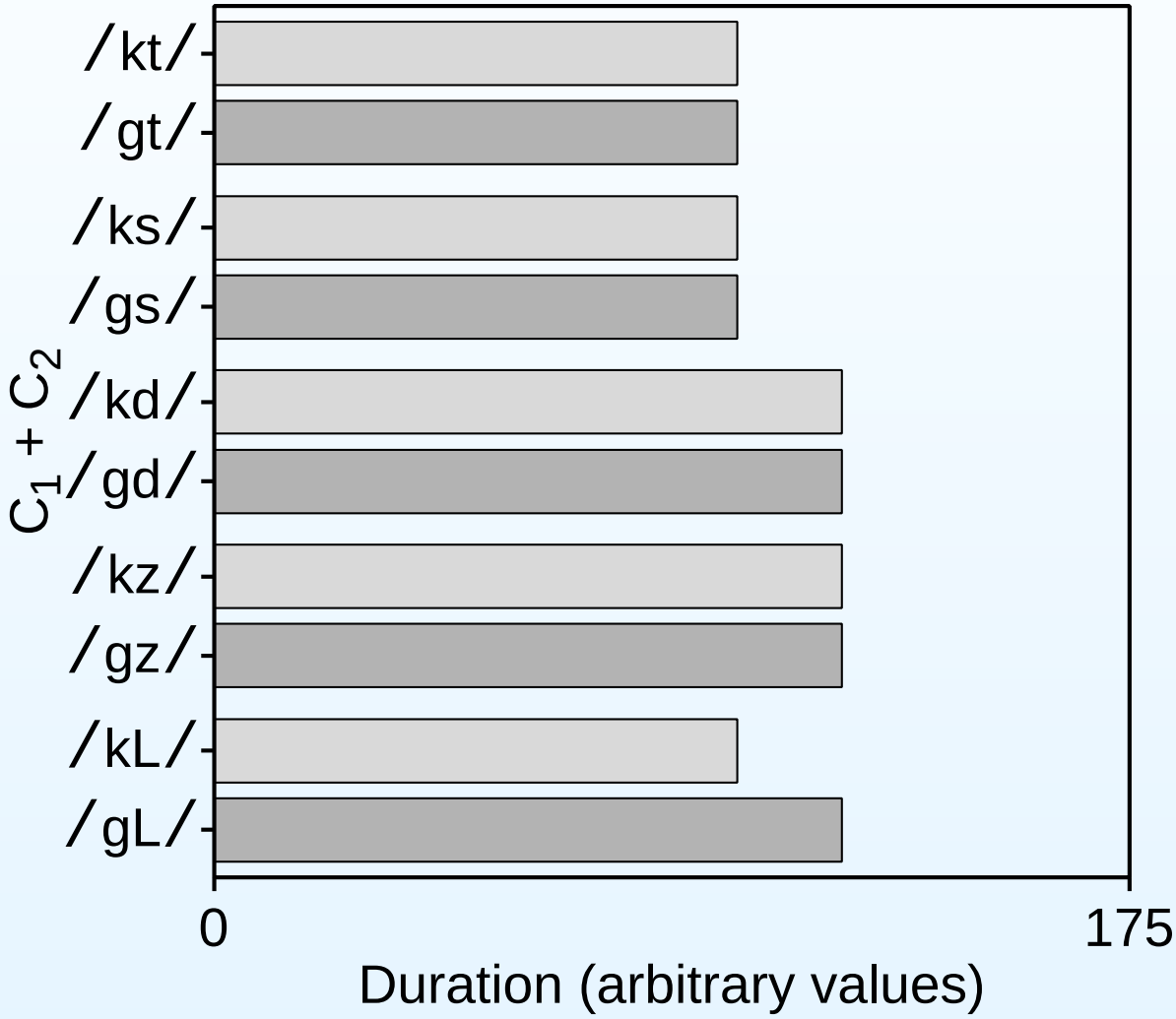
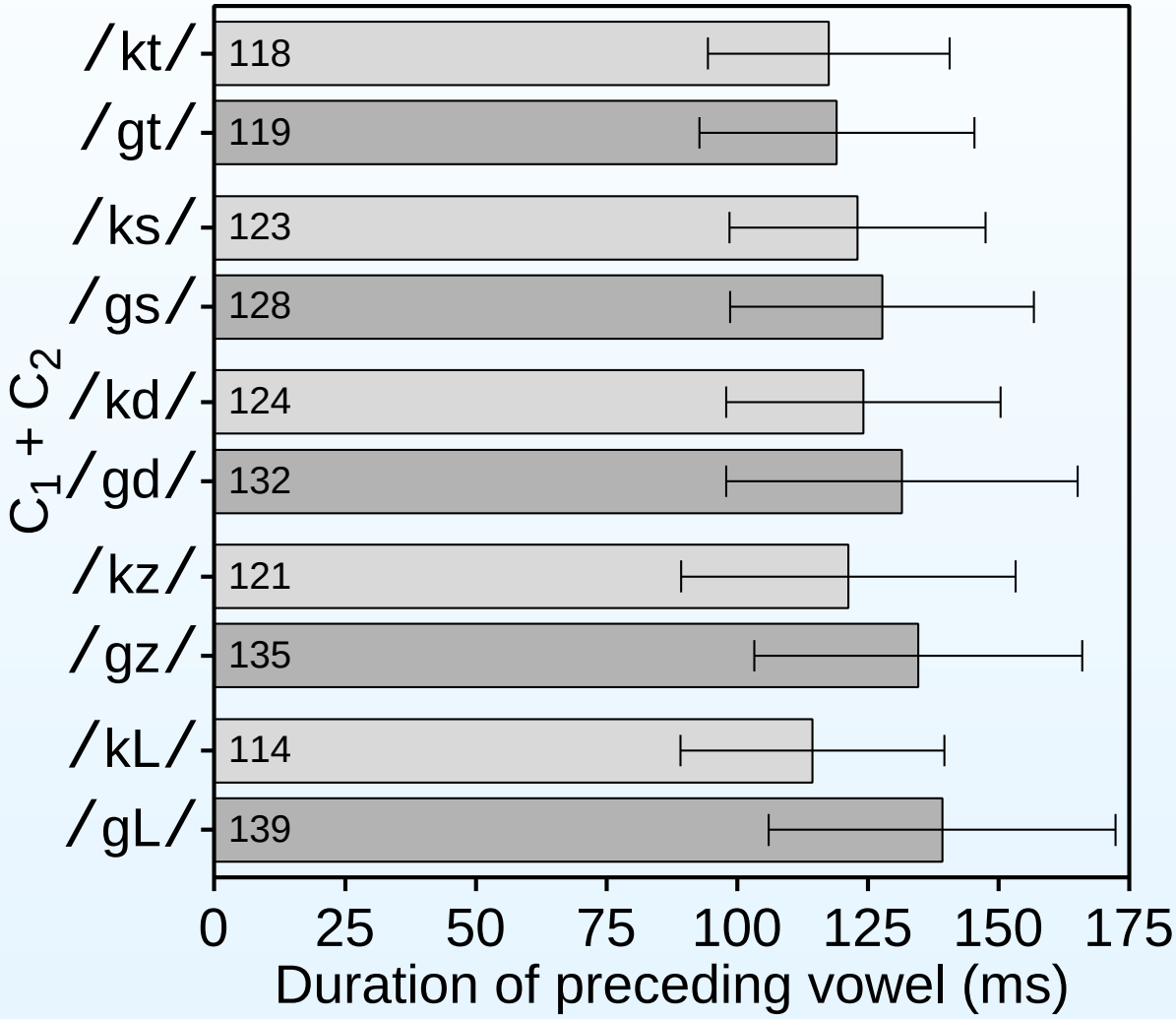
  - we expect preceding vowel duration to make no systematic distinction between /k/ and /g/ and /ʃ/ and /ʒ/ when followed by another obstruent

Preceding vowel duration: predictions



Results (long vowels only)

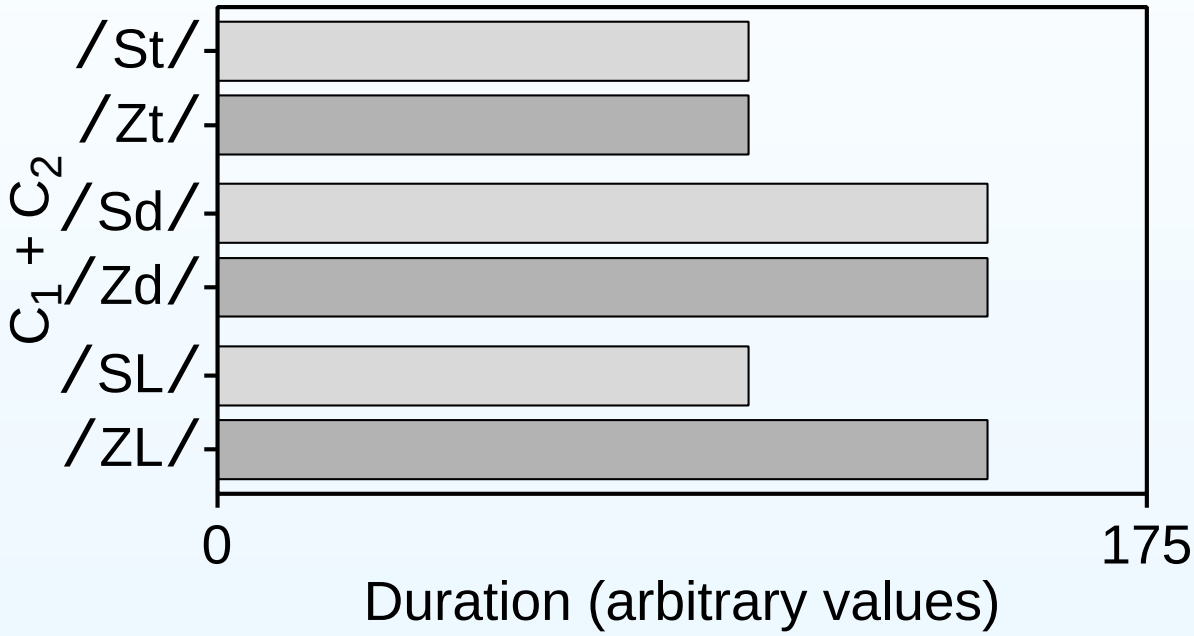


Results (long vowels only)

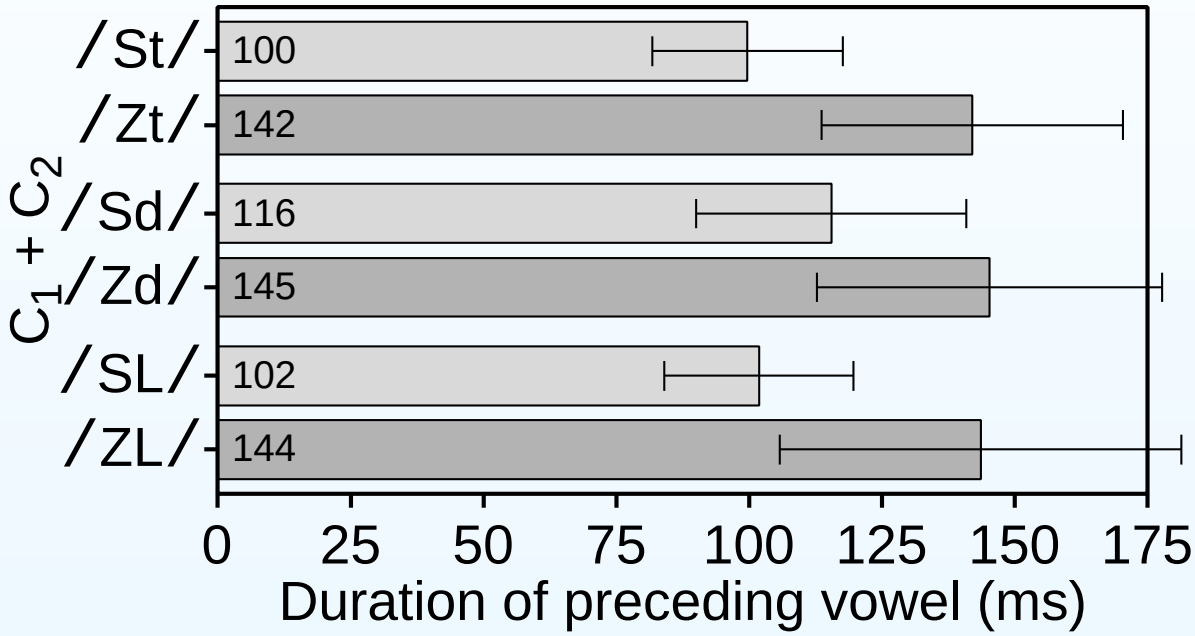
- Two-way ANOVA results for preceding vowel duration (long vowels + plosive C_1, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	F(1,269) = 3.04, n.s.
C_2 Laryngeal specifi cation	F(1,269) = 2.70, n.s.
C_1 Lar. spec. * C_2 Lar. spec.	F(1,269) = .784, n.s.

Preceding vowel duration: predictions



Results (long vowels only)



Results (long vowels only)

- Two-way ANOVA results for preceding vowel duration (long vowels + fricative C_1 only, baseline environment excluded)

Factor	
C_1 Laryngeal specifi cation	F(1,90) = 43.42, $p < .001$
C_2 Laryngeal specifi cation	F(1,90) = 3.05, n.s. ($p < .085$)
C_1 Lar. spec. * C_2 Lar. spec.	F(1,90) = 1.31, n.s.

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- Nevertheless, there is neutralisation of vowel length differences before /k, g/ + obstruent
- Vowel duration differences preserve the underlying contrast between /ʃ, ʒ/ when another obstruent follows

Preliminary conclusions

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