

When syllabic / meets Hungarian vowel harmony

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Outline

- 1 Introduction
- 2 Hypotheses
- 3 Experiment
- 4 Analysis
- 5 Results
- 6 Phonological consequences
- 7 Conclusions

Loanword phonology

- nativisation of loanwords makes it easier to understand phonological processes in the borrowing language → as well as the whole synchronous phonological system
- hitherto, Hungarian loanword phonology concerned with consonant lengthening (Nádasdy [1989], Kertész [2006], Huszthy [2016], Magyar [2017])
- American Hungarian: Fenyvesi and Zsigri [2007]

Loanwords containing syllabic consonants

- syllable nuclei in Hungarian are vowels → there are no **syllabic** consonants in the native sublexicon
- some contact languages of Hungarian *do* contain some

Classical Repair Strategy

- word-final *i*-epenthesis (*Kipfel* → /kifli/ 'a bakery product', *Zettel* → /tsetli/ 'slip of paper'; *Socken* → /zokni/ 'socks')
- ca. 120 stems
- donor language: mostly German, but also some Yiddish (/ma:zli/ 'luck' < *mazel*, /bo:vli/ 'junk' < *bowel*) or English (/singli/ < *single*) loans
- not entirely productive (e.g. /pazl̩:/ 'jigsaw puzzle' < *puzzle*)

How do speakers of Hungarian pronounce loanwords containing syllabic /ʔ/

Hungarian Vowel Harmony Rebrus and Törkenczy [2019]

	Trigger class	Target class
Palatal harmony	{every V}	{every V \ {i, i:}}
Rounding harmony	{front Vs}	{ε, ø}

Trigger and target classes

- root-controlled, its domain: the word
- labial harmony is parasitic: only if palatal harmony is active
- the only triple alternation: $o \sim \varepsilon \sim \emptyset$

Classes in Hungarian Vowel Harmony

Classes	Elements	Notation
back vowels	$\{u, u:, o, o:, \partial, a:\}$	B
front (rounded) vowels	$\{y, y:, \emptyset, \emptyset:\}$	F
neutral vowels	$\{i, i:, e:, (\varepsilon)\}$	N

Grouping of vowels

Patterns in Hungarian Vowel Harmony

_B		_F	
[BB]B	bɒra:t- hoz	[BF]F	pɒrfym-høz
[FB]B	glyko:z- hoz	[FF]F	køɲøk-høz
[NB]B	vira:g- hoz	[NF]F	tribyn-høz
_N		_L	
[BN]B/N	kɒde:t- hoz/-hez	[BL]B/F	gu:g :- hoz/-høz
[FN]N	ø sve:r- hez	[FL]F	lø:b :- høz
[NN]N	zili:p- hez	[NL]F	li:d :- høz

Patterns in the case of three-way alternation

How can we classify syllabic /l/ in the vowel harmony?

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 - The other possible alternant (neutral with neutral stems and back with back stems) can occur if there is no vowel epenthesis in the word: /gug|:-hoz/, but /gugVl-høz/.
 - In turn, the front suffix alternants are selected if the stem contains a reduced vowel as the nucleus of its second syllable: /lidVl-øn/, /gugVl-høz/.

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Experiment

- SpeechRecorder [Draxler and Jänsch, 2004]
- soundproof studio with omnidirectional head microphone
- task: Read the sentence by substituting the word in front of it with the suffix you think is appropriate!
- 6 target words
 - two surnames: *Ybl*, *Strobl* (/i(:)b|:/, /ʃtro:b|:/)
 - three brand names (vacillation): *Lidl*, *Google*, *Doodle*
(/lid|:/ ~ /lidli/, /gu(:)g|:/ ~ /gugli/, /du(:)d|:/ ~ /dudli/)
 - one common noun (vacillation): *puzzle* (/paz|:/ ~ /pazli/)
'jigsaw puzzle'
- 3 × 2 environments:
 - nominative case (NOM): -∅
 - allative case (ALL; 'to X'): -hoz/-hez/-høz
 - superessive case (SUE; 'on the surface of X'): -on/-en/-øn
×
 - yes/no questions
 - declaratives

Examples

Példák

Strobl: A szobrok legfinomabb részletei sem tudtak kifogni ____.

'Even the finest details of the sculptures could not catch ____.' (SUE)

puzzle: Van még értelme este kilenckor hozzáfogni egy ____?

'Does it still make sense to start ____ at 9pm?' (ALL)

Lidl: Szerinted nyitva van még a legközelebbi ____?

'Do you think the nearest ____ is still open?' (NOM)

Experiment

- 36 target sentences + 72 fillers = 108 sentences / speaker
 - in randomised order
 - of the forms belonging to a lexeme, the first to appear was always the suffixless declarative form
- speakers
 - 28 participants
 - age: between 19 and 57 years (average: 29,1y, SD: 13,2y)
 - 14 men and 14 women
 - place of residence: Budapest (capital) and its surroundings; place of origin: municipalities of various kinds within Hungary (+1 from Romania)
 - 1 further speaker excluded (from Vojvodina, Serbia – he pronounced the target words consistently differently: /i:beɪ/, pa:zeɪ)

Experiment

Limitations

- The vast majority of speakers have a higher education qualification, or are currently a university student.
- The target words written in their original spelling in front of the sentence had to be produced in a laboratory environment.

This step of research did not involve the investigation of word-final *i*-epenthesis or other repair strategies.

Anecdote

"Once, I uttered /du:ɖli/ just to indicate to you that I'd use that form as well."

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Analysis

- phonetic analysis by means of Praat [Boersma and Weenink, 2021]: 1008 sentences (28×36)
- statistical analysis by means of R [R Core Team, 2021]
 - after excluding mistakes / hesitations: 934 sentences

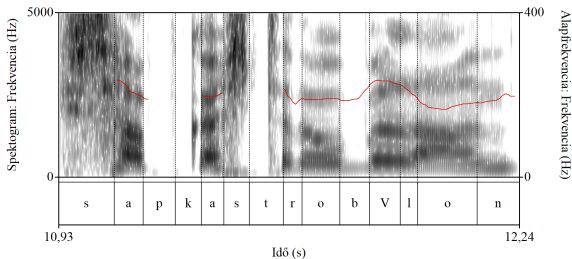
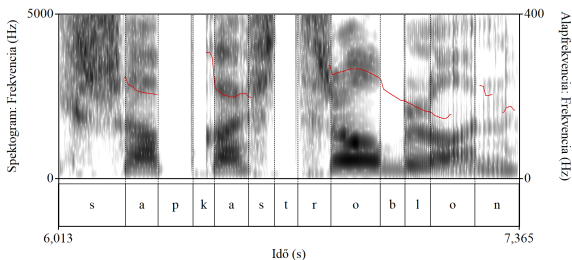
Praat

- two annotators, common strategy after annotating the first speaker
- distinguishing between /l/ and V+/l/ sequences (visual inspection, formant tendencies, perceptual judgements)
- vocalisation of /l/ was not investigated
- measuring first and second formants (F_1 and F_2) between the 30th and the 70th percentile → median

Analysis

- syllable count: based on the intonation peak in yes/no questions [Siptár and Törkenczy, 2000]
- it occurs on the penultimate syllable
 - *if /l/* is syllabic → disyllabic stem
 - peak on the *l* in suffixed forms
 - peak on the first syllable of the stem in stem forms
 - *if /l/* is not syllabic → monosyllabic stem
 - peak on the first syllable of the stem in suffixed forms
 - peak on the previous word in stem forms
- E.g.: 'Was it because of his baldness that Strobl was always wearing a cap?'
 - *Vajon a kopaszsága miatt volt mindig /ʃɒpkɒ ʃtrò:bí.lòn/?*
 - *Vajon a kopaszsága miatt volt mindig /ʃɒpkò ʃtró:b.lòn/?*

Segmentation of target words



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Hypothesis 1

Speakers pronounce the loanwords containing syllabic /l/ as disyllabic.

- syllabic /l/ in 98.1% of stem forms (155/158)
- syllabic /l/ in 97.4% of suffixed forms (301/309)

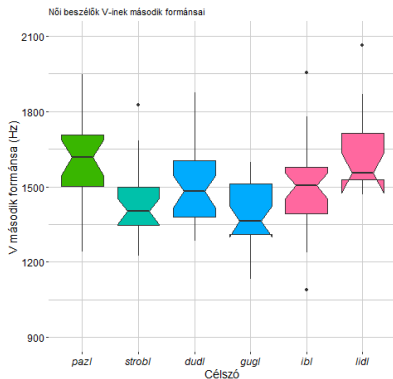
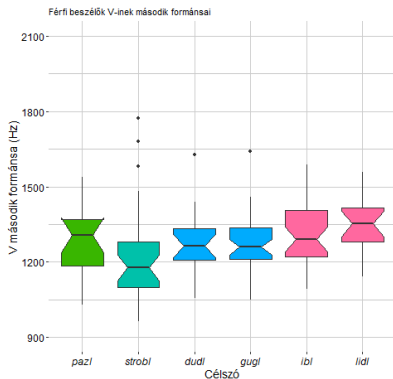
Hypothesis 2

The nucleus of the second syllable varies: both a syllabic /l/ and a reduced vowel inserted between the two final consonants (V) can occur.

	in yes/no questions	in declaratives	altogether
in stem forms	37.80%	27.88%	32.83%
before -hOz	47.06%	45.28%	46.15%
before -On	77.93%	68.92%	73.38%
altogether	53.46%	46.61%	50%

Proportion of epenthetic Vs per suffix and sentence type

On the quality of the epenthetic vowel V



On the proportions of the epenthetic vowel

- $v = \frac{\text{forms with epenthetic V}}{\text{all forms}} \times 100$
- $v_{\text{yes/no}} > v_{\text{declarative}}$
- $v_{\text{SUE}} > v_{\text{ALL}} > v_{\text{stem}}$
- differences (in average marginal effects of binomial GLMM)
all significant

$v_{\text{yes/no}} > v_{\text{declarative}}$

- yes/no question intonation rising until penultimate syllable (peak)
- the peak is best perceptible on a nucleus
- V more favourable as a nucleus than /l/
- $\rightarrow$ V is more motivated because of intonation peak marking

On the proportions of the epenthetic vowel

$$v_{\text{SUE}} > v_{\text{ALL}}$$

- before *-On*, V is more frequent than before *-hOz*
- resyllabification of /l/ to fill hiatus

$\sigma(\text{O}, \text{N}) + \sigma(\text{N}, \text{Co}) = \text{CL:} + \text{-On} \rightarrow \text{hiatus}$ vs

$\sigma(\text{O}, \text{N}) + \sigma(\text{O}, \text{N}, \text{Co}) = \text{CL} + \text{-lOn} \rightarrow \text{no hiatus}$ or

$\sigma(\text{O}, \text{N}) + \sigma(\text{O}, \text{N}, \text{Co}) = \text{CV} + \text{-lOn} \rightarrow \text{no hiatus}$

- supported by a significantly shorter *l* segment in SUE forms (post-hoc tests on the β s of the LMM on the length of *l*)
 - segments usually shorter in onset than in nucleus or coda

On the proportions of the epenthetic vowel

$$v_{\text{suffix}} > v_{\text{stem}}$$

- Jurgec and Bjorkman [2018]: affixed forms are less frequently irregular than stem forms → difference in the adaptation of the affixed and stem forms of loanwords
- e.g.: /gugøɫ-høz/ ‘Google-ALL’
- however, full [ø] is only a tendency

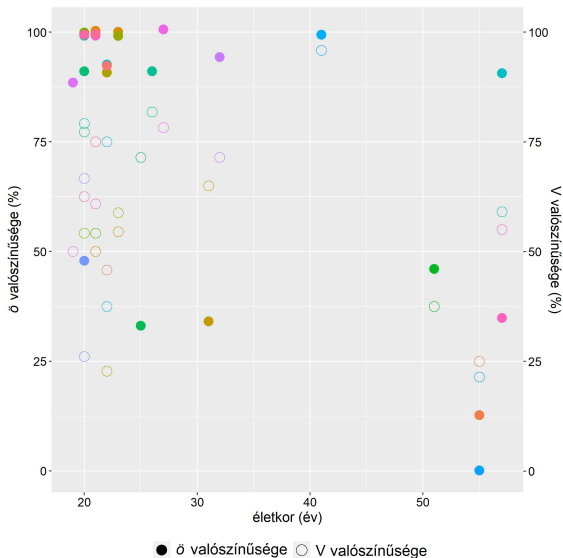
Hypothesis 3

In the case of suffixes realising three-way alternation, usually the front alternant (/ - $\emptyset$ n /, / -h $\emptyset$ z /) occurs, irrespective of the first vowel of the stem.

- Data supports the hypothesis.
- There is a greater tendency for back stems to show variation.

V harmonicitása: $\bar{o}$ a tő első V-jával antiharmonikus o a tő első V-jával harmonikus o/e

Hypothesis 3: Distribution by speakers' age



Hypothesis 3a–b

- The other possible alternant (neutral with neutral stems and back with back stems) can occur if there is no vowel epenthesis in the word.
- In turn, the front suffix alternants are selected if the stem contains a reduced vowel as the nucleus of its second syllable.

Proportion of epenthesis

$$v = \frac{\text{suffixed forms with epenthetic V}}{\text{all suffixed forms}} \times 100$$

Proportion of labiality

$$\phi = \frac{\text{suffixed forms with front alternant}}{\text{all suffixed forms}} \times 100$$

Hypothesis 3a–b

	<i>v</i> (epenthesis)		<i>ϕ</i> (labiality)
<i>Doodle</i>	55.24% (58)	<	80.00% (84)
<i>Google</i>	84.16% (85)	>	76.24% (77)
<i>Strobl</i>	71.72% (71)	≈	68.69% (68)
<i>puzzle</i>	46.94% (46)	≪	88.78% (87)
<i>Ybl</i>	66.34% (67)	<	95.05% (96)
<i>Lidl</i>	31.63% (31)	≪	96.94% (95)

Proportions of epenthetic Vs and of front (rounded) suffix alternants by target word

Front alternants appear more frequently than epenthetic vowels would suggest.

Hypothesis 3a-b

	front alternant	back alternant	$P(\phi v)$
epenthesis	306	52	85.5%
no epenthesis	201	43	82.4%
$P(v \phi)$	60.4%	54.7%	

Conditional probabilities of epenthesis and front alternant

Statistical independence of epenthesis and harmony

χ^2 test

- $p = 0.363$
- $C^* = 0.0524$
- $w = 0.0371$

Hypothesis 4: Other explanations

- Hypothesis 3a–b is not supported by the data.
- another possible explaining factor: formant structure of [l] similar to that of [ø]
- similar in our data

	[ø]	[l]
F ₁ (Hz)	470 (m) / 520 (f)	300-400
F ₂ (Hz)	1300 (m) / 1550 (f)	1300-1600

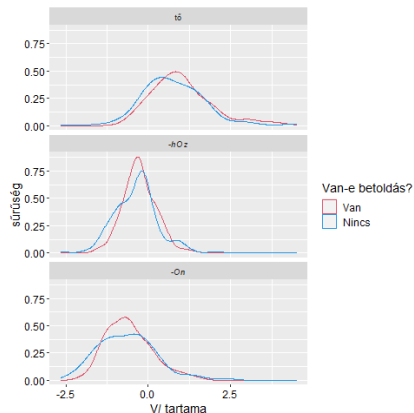
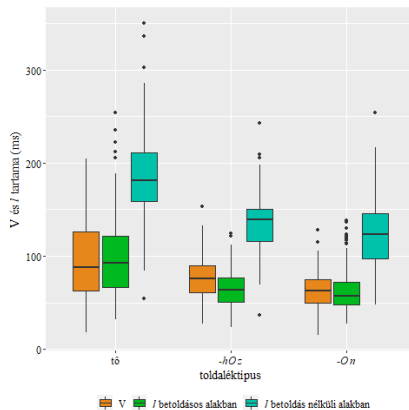
Formants of [ø] and [l] based on [Markó, 2017]

Additional findings

Length of (V)/ sequence does not depend on whether there is an epenthetic V or not.

(Based on the insignificance of dummy variable *epenthesis* in an LMM.)

Additional findings



Main conclusion

- The harmonic behaviour of /l/ is not influenced by the presence of an epenthetic vowel.
- The length of epenthetised V+/l/ and pure /l/ sequences does not differ significantly.

→ Syllabic /l/ is a trigger of vowel harmony in its own right (and cannot be grouped in any of the existing nucleus classes, see below).

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Harmonic patterns involving syllabic /l/

	Labial harmony	
[NN]	zilip-hɛz	*zilip-høz
[NL]	*lidl̥ɪ-hɛz	lidl̥ɪ-høz
[NF]	*tribyn-hɛz	tribyn-høz

Patterns in labial harmony

	Palatal harmony	
[BN]	kɔde:t-nɛk	kɔde:t-nɔk
[BL]	ʃa:dɫɪ-nɛk	ʃa:dɫɪ-nɔk
[BF]	pɔrfym-nɛk	*pɔrfym-nɔk

Patterns in palatal harmony

How can we classify syllabic /l/ in the vowel harmony?

Colliding patterns

[-B]		[-F]	
[BB]B	bɒra:t- hoz	[BF]F	pɒrfym- høz
[FB]B	glyko:z- hoz	[FF]F	kønøk- høz
[NB]B	vira:g- hoz	[NF]F	tribyn- høz
[-N]		[-L]	
[BN]B/N	kɒde:t- hoz /- hez	[BL]B/F	gu:g :- hoz /- høz
[FN]N	øsve:r- hez	[FL]F	lø:b :- høz
[NN]N	zilip- hez	[NL]F	lid :- høz

Patterns in the case of three-way alternation

L: new class of nuclei consisting of a single element?

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 - Otherwise, it is transparent in back stems, following the pattern of neutral vowels.
 - In neutral stems, it is always the last syllable which determines the harmony: syllabic /l/ triggers front alternants as default.

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