

# Linking vowels are paradigm classes in Hungarian

Péter Rebrus<sup>H/E</sup> & Péter Szigetvári<sup>E</sup> & Miklós Törkenczy<sup>E/H</sup>

Hungarian Research Centre for Linguistics & Eötvös Loránd University



16th International Conference on the Structure of Hungarian  
28–29 June 2023, Graz

# plan

- define & illustrate linking vowels
- general analytic issues, quality & its conditioning
- morpheme-based representational accounts & associated problems
- paradigmatic pattern & advantages of a paradigm-based approach
- paradigmatic pattern & phonological/morphological cues
- summary & future research

# what is a linking vowel? (cf. Kálmán et al. 2012)

a linking vowel (LV) is a (short) vowel that is

- stem/suffix-peripheral
- alternates with zero (= unstable)
  - does not occur in some forms in a stem paradigm (same lexeme with different exponents)
  - does not occur in some forms in a suffix paradigm (same exponent with different lexemes).
- does not occur in the exponentless (i.e. unsuffixed) form

this excludes

- stem-internal unstable vowels in **epenthetic stems**, e.g. *malom* – *malm-i*, *sodor* – *sodr-ás*
- **stable** stem-final vowels, e.g. *puli-val* – *puli-nk*, *falu-ba* – *falu-m*, *ferde-ség*
- **stable** suffix-initial vowels, e.g. *eszperantó-ul*; *magas-odik* – *savany<ú>-odik*; *alfá-adik*; *dal-a*
- **truncation**, e.g. *barnaa* – *barn-ul*, *szőkee* – *szők-ít*, *Mártaa* – *Márt-i*, *kutya* – *kuty-us* etc.

# examples of vowel–zero alternations

## linking vowel absent

*karó-nk* 'stick-POSS.1PL'

*nő-i-k* 'woman-PL-POSS.3PL'

*kapu-k* 'gate-PL'

*köt-tök* 'bind-2PL'

*hiú-bb* 'vane-CMPR'

*vér-t* 'harm-ACC'

## linking vowel present

*kar·u·nk* 'arm-POSS.1PL'

*nej·ü·k* 'wife-POSS.3PL'

*lap·o·k* 'page-PL'

*költ·ö·tök* 'brood-2PL'

*új·a·bb* 'new-CMPR'

*gyér·e·t* 'sparse-ACC'

# issues

Q1. morphological affiliation

Q2. conditions on occurrence (phonotactic, lexical, category-dependent factors)

Q3. **conditions on quality**

**Q3a. lexical factors from both directions**

Q3b. systematic correspondences between linking vowels and vowels of different status

- licensing of 3rd POSS yodless variants (-**a**~**e**, -**uk**~**ük**)
- parallels between LVs and other suffix-initial vowels (e.g. *hat-**o**dik*, *nyolc-**a**dik*)

Q3c. asymmetry: stricter harmonic behaviour of linking vowels as opposed to suffix-internal harmonic vowels (e.g. *haver-**o**/\***e**-k* vs. *haver-**hoz**/**hez***; *partner-**e**/\***o**-k* vs. *partner-**hoz**/**hez***)

# Q1: the morphemic status of the linking vowel

- part of the suffix (e.g. Siptár & Törkenczy 2000)
- part of the stem (e.g. Abondolo 1988, Rebrus 1997)
- extramorphemic (e.g. Vago 1980, Siptár & Törkenczy 2000, etc.)
  - the vowel is epenthetic: not part of the underlying lexical forms of the suffixes
  - Optimality Theory: consistency of exponence (McCarthy & Prince 1993)
- irrelevant
  - our approach (word-based): strict morphological segmentation is not needed (cf. Blevins 2016)
  - motivation: both the previous and the following morpheme governs the appearance and quality of the linking vowel

## Q2: occurrence and quality of LVs largely independent

linking vowel absent	linking vowel present	“motivation”
<i>nyom-tok</i> ‘push-2PL’	<i>nyom·o·tok</i> ‘trace-POSS.2PL’	verb vs. noun stem
<i>gond-nak</i> ‘trouble-DAT’	<i>mond·a·nak</i> ‘say-NDF.3PL’	noun vs. verb stem
<i>fiŋg-t-a</i> ‘fart-PST-DEF’	<i>fiŋg·o·tt-a</i> ‘id.’	phonotactic (verb)
<i>briliáns-t</i> ‘brilliant-ACC’	<i>briliáns·o·t</i> ‘id.’	phonotactic (noun)
<i>fiú-k</i> ‘boy-PL’	<i>hiú·a·k</i> ‘vain-PL’	noun vs. adjective

## Q3a: quality of LVs (back non-high examples)

mid/rounded linking V	low/unrounded linking V	“reasons”:
a. <i>sark·o·k</i> ‘ <u>corner</u> -PL’	<i>sark·a·k</i> ‘ <u>heel</u> -PL’	non-lowering vs. <b>lowering</b> stem
b. <i>diák·o·t</i> ‘ <u>student</u> -ACC’	<i>diá·k·a·t</i> ‘slide- <u>PL</u> -ACC’	non-lowering stem vs. <b>lowering suffix</b>
c. <i>lát·n·o·m</i> ‘see- <u>INF</u> -1SG’	<i>lát·t·a·m</i> ‘see- <u>PST</u> -1SG’	non-lowering vs. <b>lowering suffix</b>
d. <i>já[ts:]·o·k</i> ‘play- <u>INDV</u> -NDF.1SG’	<i>já[ts:]·a·k</i> play- <u>SBJV</u> -NDF.1SG’	“opaque” lowering suffix
e. <i>boldog·o·k</i> ‘happy-PL’	<i>boldog·a·k</i> ‘id.’	<b>vacillating adjectival</b> stem
f. <i>tart·o·tok</i> ‘hold- <u>NDF.2PL</u> ’	<i>tart·a·nak</i> ‘hold- <u>NDF.3PL</u> ’	<b>leftward</b> “neutral” vs. <b>low suffix</b>
g. <i>kapu-k·o·n</i> ‘gate-PL- <u>SUE</u> ’	<i>kapu-k·a·t</i> ‘gate-PL- <u>ACC</u> ’	<b>leftward mid</b> vs. “neutral” <b>suffix</b>



## Q3a: quality of LV sequences

	2nd LV: mid	2nd LV: low
a.	dal·o·k·o· <u>n</u> 'song-PL- <u>SUE</u> ' fal·a·k·o· <u>n</u> 'wall-PL- <u>SUE</u> '	dal·o·k·a· <u>t</u> 'song-PL- <u>ACC</u> ' fal·a·k·a· <u>t</u> 'wall-PL- <u>ACC</u> '
b.	hat·o· <u>d</u> ·o·t 'six- <u>FRAC</u> -ACC' nyolc·a· <u>d</u> ·o·t 'eight- <u>FRAC</u> -ACC'	hat·o· <u>d</u> ·a·t 'six- <u>POSS.2SG</u> -ACC' nyolc·a· <u>d</u> ·a·t 'eight- <u>POSS.2SG</u> -ACC'
c.	tart·a· <u>n</u> ·o·m 'hold- <u>INF</u> -1SG' vár·a·tlan·o· <u>k</u> 'expect-PRIV- <u>PL</u> '	tart·o· <u>tt</u> ·a·m 'hold- <u>PST</u> -1SG' vár·a·tlan·a· <u>bb</u> 'expect-PRIV- <u>CMPR</u> '

# morpheme-based account

the **height** specification of a LV is lexically determined by adjacent morphemes:

- backward (linking vowel on the left)
  - **conformist suffix**: depends on the right specification of the previous morpheme
    - nonhigh **o~ö~a~e**
  - nonconformist suffix: depends on the left specification of the following morpheme
    - low **a~e** or mid/low **o~ö~e** or high **u~ü**
- forward (linking vowel on the right)
  - **nonlowering stem/suffix**:
    - mid **o~ö~e** if the left specification of the following morpheme is **conformist** or mid
    - otherwise: same as the left specification of the following morpheme (low or high)
  - **lowering stem/suffix**:
    - low **a~e** if the left specification of the following morpheme is **conformist** or low
    - otherwise: same as the left specification of the following morpheme (mid or high)

## Q3a: left and right requirements for LVs (back only)

### morpheme1 + LV + suffix2

right requirement of morpheme1:	status of morph1	left requirement of suffix2:			
		low	conformist	“mid”	high
non-lowering	root	vak· <b>a</b> ·bb tart· <b>a</b> ·lak	vak· <b>o</b> ·k tart· <b>o</b> ·m	vak· <b>o</b> ·n %vagy· <b>o</b> ·n	vak· <b>u</b> ·nk tart· <b>u</b> ·nk
	suffix	só-tlan· <b>a</b> ·bb %vár-n· <b>a</b> ·lak	só-tlan· <b>o</b> ·k vár-n· <b>o</b> ·m	só-tlan· <b>o</b> ·n –	só-tlan· <b>u</b> ·nk vár-n· <b>u</b> ·nk
lowering	root	tág· <b>a</b> ·bb –	tág· <b>a</b> ·k –	ág· <b>o</b> ·n –	ág· <b>u</b> ·nk –
	suffix	só-s· <b>a</b> ·bb vár-j· <b>a</b> ·lak	só-s· <b>a</b> ·k vár-j· <b>a</b> ·m	só-s· <b>o</b> ·n vár-j· <b>o</b> ·n	só-s· <b>u</b> ·nk vár-j· <b>u</b> ·nk

# representing linking vowels

usual technical solutions (e.g. Siptár & Törkenczy 2000, Stiebels & Wunderlich 1999, Vago 1980)

*A linking vowel is “defective”: a vowel that is underlyingly missing or empty or underspecified.*

- problem 1: the occurrence cannot be predicted uniformly (mainly lexically determined)
- problem 2: the quality cannot be predicted uniformly (mainly lexically determined)
- problem 3: proliferation of underspecification:
  - *ad hoc* ways of underspecification (without independent motivation)
  - even this is insufficient: LV occurrence and quality are partially independent
  - other (non-linking) harmonically alternating vowels are usually also underspecified and must be distinguished from linking vowels (e.g. Siptár 1998)

# problems of morpheme-based accounts

- technical issues due to the two directions of lowering
  - floating features are problematic: directionality of docking (Rebrus & Polgárdi 1997)
  - even for stem-internal unstable vowels (epenthetic stems)
- overcomplicated default mechanisms:
  - **L-NONCONFORMIST** (mid or high) >> **R-LOWERING** >> **L-CONFORMIST**
  - **L-NONCONFORMIST** (low or high) >> **R-NONLOWERING**
  - default (R-nonlowering & L-conformist) = **mid**
- representational issues of rounding harmony (e.g. Polgárdi & Rebrus 1998)
  - mid front **ö** has to be licensed by a previous front rounded **ü** or **ö**
  - otherwise: neutralization with low **e**: abstract “mid” e is realized as low
  - **R-LOWERING** >> **ROUNDING HARMONY** >> **DEFAULT MID** (e.g. *fül·e·k*, *\*fül·ö·k*; *csel·e·k*, *\*csel·ö·k*)
- syntactic and morphological categories
  - wildly accepted distinctions are not clear-cut: adjectiveness and inflectional status do not always cooccur with R-lowering (Rebrus & Szigetvári 2022)

# our claim

- conformist **linking vowels are paradigm class markers**
  - they determine the LV of “prototypical” suffixes (PL, most POSS; 1/2SG verbal, etc)
  - extended to certain derivational suffixes (e.g. ADJZ *-s*, ADVZ *-n*, VRBZ *-l, -z*), see Steriade 2000
  - cross-linguistically: class membership can be phonologically and/or morphologically clued to variable extent
- nonconformist suffixes **neutralize** paradigm class distinctions
  - maintain the limited vowel distinctions of their affix paradigms
  - L-low/L-high/L-“mid” override paradigm class differences (e.g. *fal·u·nk*, *fal·o·n* vs. *fal·a·k*; *vak·a·bb* vs. *vak·o·k*)
  - cross linguistically: in paradigms “marked” morphosyntactic values often do not display all distinctions

# the mutual dependence of linking vowels (back and front, non-high LV)

harmonic class	paradigm classes	suffix paradigm types		
		low	conformist	“mid”
back or front rounded	“nonlowering” paradigm	vak· <b>a</b> ·bb hős· <b>e</b> ·bb old· <b>a</b> ·nak küld· <b>e</b> ·nek	vak· <b>o</b> ·k hős· <b>ö</b> ·k old· <b>o</b> ·k küld· <b>ö</b> ·k	vak· <b>o</b> ·n hős· <b>ö</b> ·n %vagy· <b>o</b> ·n %mögy· <b>ö</b> ·n
	“lowering” paradigm	tág· <b>a</b> ·bb zöld· <b>e</b> ·bb old-j· <b>a</b> ·nak küld-j· <b>e</b> ·nek	tág· <b>a</b> ·k zöld· <b>a</b> ·k old-j· <b>a</b> ·k küld-j· <b>e</b> ·k	tág· <b>o</b> ·n zöld· <b>ö</b> ·n old-j· <b>o</b> ·n küld-j· <b>ö</b> ·n
front unrounded	“all lowering” paradigm	gyér· <b>e</b> ·bb kezd-(j)· <b>e</b> ·nek	gyér· <b>e</b> ·k kezd-(j)· <b>e</b> ·k	gyér· <b>e</b> ·n kezd-j· <b>e</b> ·n

# paradigmatic patterns by the quality of linking vowels

paradigm classes	suffix paradigm types				Examples:
	low	conformist	"mid"	high	
(i) ·o·	a	o	o	u	<i>tag vak sír (fúr-n-); -old (fúr, só-z)</i>
(ii) ·a·	a	a	o	u	<i>ág tág díj; nál- után (fúr-j fúr-t)</i>
(iii) ·e e·	e	e	e	ü	<i>heg gyér hír (ér-n-); vel-kezd (ér-j ér-t sí-z-)</i>
(iv) ·e ö·	e	e	ö	ü	<i>szög zöld; től- előtt (tör-j tör-t)</i>
(v) ·ö·	e	ö	ö	ü	<i>rög hős (tör-n-); -küld (tör nő-z-)</i>
(vi) —	—	—	—	—	<i>sí kapu apró; rá- alá (fúr-ná- fúr-já- ér-i)</i>
Examples:	(-bb -t An) -lAk -nAk (-n- ...)	-k -m -d -tOk (-t -z -l -n -s ...) -k -m -d -tOk (-k -tt -z -l -gAt ...)	-n (-n)	-nk (-k) -nk (-k)	



# the extent of phonological motivation in paradigm class membership

- **no** phonological clue (lexical): (i)  $\cdot\mathbf{o}\cdot$  vs. (ii)  $\cdot\mathbf{a}\cdot$ , and (iv)  $\cdot\mathbf{\ddot{o}}\cdot$  vs. (v)  $\cdot\mathbf{e|}\mathbf{\ddot{o}}\cdot$  (**lowering**)
  - **category**-based clues for lowering: VERB(no) < NOUN(exceptional) < ADJ(near-productive)
  - **morphological** clues for lowering: DERIVATION(unfrequent) < INFLECTION(frequent)
  - widespread **hesitation** for adjectival roots (productively also, cf. Rebrus & Szigetvári 2022)
- **some** phonological clues (partly lexical): (i-ii)  $\cdot\mathbf{o}\cdot/\cdot\mathbf{a}\cdot$  vs (iii)  $\cdot\mathbf{e|}\mathbf{e}\cdot$  (**front-back harmony**)
  - roots containing *i/é*: lexical **variation**: antiharmony, e.g. *sír·o·k*, *díj·a·k* vs. *hír·e·k*
  - roots containing back+neutral vowel(s): **hesitation** in transparency, e.g. *fotel·o·k*~*fotel·e·k*
  - several **morphological** clues, e.g. harmonic uniformity (Rebrus & Törkenczy 2017, 2021, Rebrus et al. 2023)
- **perfect** phonological clue: classes (iii)  $\cdot\mathbf{e|}\mathbf{e}\cdot$  vs. (iv-v)  $\cdot\mathbf{\ddot{o}}\cdot/\cdot\mathbf{e|}\mathbf{\ddot{o}}\cdot$  (**rounding harmony**)
  - class  $\cdot\mathbf{\ddot{o}}\cdot/\cdot\mathbf{e|}\mathbf{\ddot{o}}\cdot$  iff the last vowel of the stem is front rounded *ü* or *ö*
- near-perfect clue: classes without vs. with linking vowel (V-final vs. C-final stems)

# advantages of a paradigm-based approach to LVs

Q1: morphological segmentation

- not needed since whole word-forms are the basic unit of the theory (see *Word and Paradigm Morphology*, Ackerman et al. 2009, Blevins 2016, Blevins et al. 2017)

Q3a: lexical factors of LV quality

- the quality of a LV is paradigmatically determined, it is the property of whole word forms -- rather than individual morphemes
- paradigms are not necessarily homogeneous and their boundaries are not clear-cut: subparadigms/prototypical parts can reveal tighter formal connections

Q3b: parallels between LVs and other suffix-initial vowels

- no formal distinction between them since no morphological segmentation

Q3c: asymmetry between LVs and suffix-internal alternating vowels

- harmonic variation is more restricted for LVs

# summary

- a paradigm-based approach is useful even in a basically agglutinative language
  - this view affords an economical account of LVs (similarly to “thematic” vowels in “inflectional” languages)
  - thematic vowels can be considered as **indices** of paradigm classes of stems
- Hungarian morphology: two partly independent subsystems
  - “lexical”: **paradigmatic system**: word-forms with thematic vowels (forms with LVs and similar vowels)
  - “morphophonological”: **agglutinative system**: word-forms with consonant-initial exponents
- further issues:
  - how do the two systems interact? (e.g. vowel harmony)
  - how do phonology and the paradigmatic system interact
  - what redundancies occur in the paradigmatic system and how can they be accounted for? (for an approach based on informativity within the paradigm cf. Paradigm Cell Filling Problem, Ackerman et al. 2009, Blevins et al. 2017)
  - what is the paradigmatic status of forms with multiple exponents?

# the paradigmatic system of noun stems

Paradigm classes	Suffix paradigms										
	low	conformist nonhigh							"mid"	high	
	PRIV	PL	1SG	2SG	3SG	ADJZ	etc.	ACC	SUE	1PL	3PL
(i) ·o·	rag-talan	rag·o·k	rag·o·m	rag·o·d	rag-ja	rag·o·s	...	rag·o·t	rag·o·n	rag·u·nk	rag-(j)uk
	pár·a·tlan	pár·o·k	pár·o·m	pár·o·d	pár-ja	pár·o·s	...	pár-t	pár·o·n	pár·u·nk	pár-(j)uk
(ii) ·a·	(agy·a·tlan)	vár·a·k	vár·a·m	vár·a·d	vár·a	vár·a·s	...	vár·a·t	vár·o·n	vár·u·nk	vár·u·k
(iii) ·e e·	(hit·e·tlen)	pék·e·k	pék·e·m	pék·e·d	pék-(j)e	pék·e·s	...	pék·e·t	pék·e·n	pék·ü·nk	pék-(j)ük
	(él·e·tlen)	szer·e·k	szer·e·m	szer·e·d	szer-(j)e	szer·e·s	...	szer-t	szer·e·n	szer·ü·nk	szer-(j)ük
	jel-telen	jel·e·k	jel·e·m	jel·e·d	jel·e	jel·e·s	...	jel·e·t	jel·e·n	jel·ü·nk	jel·ü·k
(iv) ·e ö·	fül·e·tlen	fül·e·k	fül·e·m	fül·e·d	fül·e	fül·e·s	...	fül·e·t	fül·ö·n	fül·ü·nk	fül·ü·k
(v) ·ö·	rög-telen	rög·ö·k	rög·ö·m	rög·ö·d	rög-je	rög·ö·s	...	rög·ö·t	rög·ö·n	rög·ü·nk	rög-(j)ük
	(szőr-telen)	kúr·ö·k	kúr·ö·m	kúr·ö·d	kúr-je	kúr·ö·s	...	kúr-t	kúr·ö·n	kúr·ü·nk	kúr-(j)ük
(vi) –	só-tlan	só-k	só-m	só-d	só-ja	só-s	...	só-t	só-n	só-nk	só-juk

# the paradigmatic system of verb stems

Paradigm classes	Suffix paradigms											
	l o w			c o n f o r m i s t   n o n h i g h						"mid"	h i g h	
	2<1SG	INF	etc.	NDF.2PL	NDF.1SG	DEF.2SG	DEF.3SG	etc.	PAST	NDF.3SG	NDF.1PL	DEF.1PL
(i) ·o·	olt·a·lak	olt·a·ni	...	olt·o·tok	olt·o·m	olt·o·d	olt·ja	...	olt·o·tt	%vagy·o·n	olt·u·nk	olt·juk
	vár·lak	vár·ni	...	vár·tok	vár·o·m	vár·o·d	vár·ja	...	vár·t		vár·u·nk	vár·juk
(ii) ·a· +	vár·t·a·lak	–	...	vár·t·a·tok	vár·t·a·m	vár·t·a·d	vár·t·a	...	–	(vár·j·o·n)	vár·t·u·nk	vár·t·uk
(iii) ·ele·	int·e·lek	int·e·ni	...	int·e·tek	int·e·m	int·e·d	int·i	...	int·e·tt	%lesz·e·n	int·ü·nk	int·jük
	kér·lek	kér·ni	...	kér·tek	kér·e·m	kér·e·d	kér·i	...	kér·t		kér·ü·nk	kér·jük
	+ kér·t·e·lek	–	...	kér·t·e·tek	kér·t·e·m	kér·t·e·d	kér·t·e	...	–	(kér·j·e·n)	kér·t·ü·nk	kér·t·ük
(iv) ·e ö· +	tör·t·e·lek	–	...	tör·t·e·tek	tör·t·e·m	tör·t·e·d	tör·t·e	...	–	(tör·j·ö·n)	tör·t·ü·nk	tör·t·ük
(v) ·ö·	önt·e·lek	önt·e·ni	...	önt·ö·tök	önt·ö·m	önt·ö·d	önt·i	...	önt·ö·tt	%mögy·ö·n	önt·ü·nk	int·jük
	tör·lek	tör·ni	...	tör·tök	tör·ö·m	tör·ö·d	tör·i	...	tör·t		tör·ü·nk	tör·jük
(vi) – (+)	vár·ná·nak	(ró·ni)	...	vár·ná·tok	vár·ná·m	vár·ná·d	vár·ná	...	(ró·tt)	(%lő·n)	vár·ná·nk	–

**References** Ackerman, Farrell, James P. Blevins and Robert Malouf. 2009. Parts and Wholes: Implicative Patterns in Inflectional Paradigms. In *Analogy in Grammar: Form and Acquisition*. J. P. Blevins, J. Blevins (eds.). Oxford: O.U.P. 54–82. ◇

Abondolo, Daniel. 1988. *Hungarian Inflectional Morphology*. Budapest: Akadémiai Kiadó. ◇

Blevins, James P. 2016. *Word and Paradigm Morphology*. Oxford: O.U.P. ◇

Blevins, James P., Petar Milin & Michael Ramscar. 2017. The Zipfian paradigm cell filling problem. In F. Kiefer, J. Blevins & H. Bartos (eds.), *Perspectives on morphological organization*, 139–158. Leiden: Brill. ◇

Kálmán László, Péter Rebrus, and Törkenczy Miklós. 2012. Possible and impossible variation. In: F. Kiefer, M. Ladányi, and P. Siptár (eds.), *Current Issues in Morphological Theory. (Ir)regularity, Analogy and Frequency*. John Benjamins. 23–49. ◇

McCarthy, John J. and Alan Prince. 1993. Generalized alignment. In: G. Booij and J. Van Marle (eds.), *Yearbook of Morphology 1993*. Springer, Dordrecht ◇

Polgárdi, Krisztina and Péter Rebrus (1998). There is No Labial Harmony in Hungarian: a Government Phonology Analysis. In C. de Groot and I. Kenesei (eds.). *Papers from the Amsterdam Conference. Approaches to Hungarian 6*. Szeged: JATEPress). 3–20. ◇

Rebrus, Péter, and Krisztina Polgárdi. 1997. Two default vowels in Hungarian?. In: G. Booij, J. Van de Weijer (eds.), *Phonology in Progress – Progress in Phonology, HIL Phonology III*. The Hague: Holland Academic Graphics. 257–275 ◇

Rebrus, Péter and Péter Szigetvári. 2022. Between adjective and noun. *Acta Linguistica Academica* 69: 188–205. ◇

Rebrus, Péter and Miklós Törkenczy. 2017. Co-patterns, subpatterns and conflicting generalizations in Hungarian vowel harmony. In: H. van der Hulst and A. Lipták (eds.), *Approaches to Hungarian, vol. 15: Papers from the 2015 Leiden Conference*. John Benjamins. 135–156. ◇

Rebrus, Péter and Miklós Törkenczy. 2021. Harmonic Uniformity and Hungarian front/back harmony. *Acta Linguistica Academica* 68/1–2:175–206. ◇

Rebrus, Péter, Péter Szigetvári, and Miklós Törkenczy. 2023. How Morphological is Hungarian Vowel Harmony? In: N. Elkins, B. Hayes, J. Jo, and J.-L. Siah (eds.), *Proceedings of the 2022 Annual Meeting on Phonology, Linguistic Society of America*. 1–10. ◇

Siptár, Péter. 1998. Hangtan. In K. É. Kiss, F. Kiefer and P. Siptár: *Új magyar nyelvtan*. Budapest: Osiris Kiadó. 291– 390. ◇

Siptár, Péter and Miklós Törkenczy. 2000. *The Phonology of Hungarian*. Oxford/New York: O.U.P. ◇

Stiebels, Barbara and Dieter Wunderlich. 1999. Second Stems in Hungarian Nouns. *The Linguistic Review* 16: 253–294. ◇

Steriade, Donca. 2000. Paradigm Uniformity and The Phonetics/Phonology Boundary. In *Papers in Laboratory Phonology 6*, edited by J. Pierrehumbert and M. Broe, 313–334, Cambridge: C.U.P. ◇

Vago, Robert M. 1980. *The Sound Pattern of Hungarian*. Washington: Georgetown University Press.

# We thank

- you for your attention
- the organizers for organizing
- NKFIH #139271 (The role of paradigm structure in Hungarian morphology and phonology with typological comparisons) for financial support

## Appendix I. Q3b: extending linking V patterns to 3rd POSS forms (nouns)

	possessor's number person	back stem		front stem (lowering)
		non-lowering	lowering	
<b>SG</b> (low V)	2	tár- <b>o</b> -d	vár- <b>a</b> -d	szer- <b>e</b> -d
	1	tár- <b>o</b> -m	vár- <b>a</b> -m	szer- <b>e</b> -m
	<b>3</b>	tár- <b><u>ja</u></b> /tár- <b><u>a</u></b>	vár- <b><u>a</u></b>	% szer- <b><u>e</u></b>
<b>PL</b> (high V)	2	tár-o-tok	vár-a-tok	szer-e-tek
	1	tár- <b>u</b> -nk	vár- <b>u</b> -nk	szer- <b><u>ü</u></b> -nk
	<b>3</b>	% tár- <b><u>u</u></b> -k	vár- <b><u>u</u></b> -k	% szer- <b><u>ü</u></b> -k



## App. I (cont). Q3b: extending linking vowel patterns to definite 3SG and 1PL verbs

subject		back stem		front stem	
number	person	non-lowering	lowering		
<b>SG.DEF</b> (low V)	2	tol- <b>o</b> -d	tol-t- <b>a</b> -d	ver- <b>e</b> -d	ver-t- <b>e</b> -d
	1	tol- <b>o</b> -m	tol-t- <b>a</b> -m	ver- <b>e</b> -m	ver-t- <b>e</b> -m
	<b>3</b>	tol- <b><u>ja</u></b>	tol-t- <b><u>a</u></b>	ver- <b><u>i</u></b>	ver-t- <b><u>e</u></b>
<b>PL</b> (high V)	NDF.2	tol-tok	tol-t-a-tok	ver-tek	ver-t-e-tek
	NDF.1	tol- <b>u</b> -nk	tol-t- <b>u</b> -nk	ver- <b><u>ü</u></b> -nk	ver-t- <b><u>ü</u></b> -nk
	<b>DEF.1</b>	tol- <b><u>ju</u></b> k	tol-t- <b><u>u</u></b> -k	ver- <b><u>jü</u></b> k	ver-t- <b><u>ü</u></b> -k

# Appendix II: unstable vowels within the stem and between stem & suffix

stem V ↓    linking V →	mid/rounded	low/unrounded
mid/rounded	sar <b>o</b> k – sark- <b>o</b> -k ‘corner, -PL’	sar <b>o</b> k – sark- <b>a</b> -k ‘heel, -PL’
low/unrounded	vac <b>a</b> k – vack- <b>o</b> -k ‘junk, -PL’	aj <b>a</b> k – ajk- <b>a</b> -k ‘lip, -PL’

# Appendix III: LVs & multiple exponents (back nonhigh Vs)

MORPH1 + LV + MORPH2 + LV + MORPH3

LEFT REQUIREMENT OF MORPH2:	RIGHT REQ. OF MORPH1 ↓	LEFT REQ. OF MORPH3 →	RIGHT REQUIREMENT OF MORPH2:		
			lowing	mid	non-lowering
			<i>low/conformist</i>	<i>mid</i>	<i>mid/conformist</i>
<b>low</b>	<i>any kind</i>		vak- <b>a</b> -bb- <b>a</b> -t tart- <b>a</b> -lm- <b>a</b> -t	vak- <b>a</b> -bb- <b>o</b> -n tart- <b>a</b> -lm- <b>o</b> -n	(pár- <b>a</b> -tlan- <b>o</b> -k) tart- <b>a</b> -n- <b>o</b> -m
<b>conformist</b>	<i>lowering</i>		ág- <b>a</b> -k- <b>a</b> -t -	ág- <b>a</b> -k- <b>o</b> -n -	nyolc- <b>a</b> -d- <b>o</b> -k -
	<i>nonlowering</i>		vak- <b>o</b> -k- <b>a</b> -t tart- <b>o</b> -tt- <b>a</b> -m	vak- <b>o</b> -k- <b>o</b> -n (tart- <b>s</b> - <b>o</b> -n)	hat- <b>o</b> -d- <b>o</b> -k tart- <b>o</b> -z- <b>o</b> -m

# Appendix III (cont): Q3a: left and right requirements for LVs (back only)

stem + suffix1 + LV + suffix2

paradigm class	suffixed stem	left requirement of suffix2:			
		lowering	conformist	“mid”	high
•o•	NOUN-VRBZ	ok-ít•a•sz	ok-ít•o•k	--	ok-ít•u•nk
	NOUN-PRIV	só-tlan•a•bb	só-tlan•o•k	só-tlan•o•n	só-tlan•u•nk
	VERB-FREQ/FACT/POT	--	hord-hat•o•k	--	hord-hat•u•nk
	VERB-PRIV	vár•a•tlan•a•bb	vár•a•tlan•o•k	vár•a•tlan•o•n	vár•a•tlan•u•nk
	VERB-INF	%vár-n•a•lak	vár-n•o•m	--	vár-n•u•nk
•a•	<b>NOUN-PL/POSS</b>	X	só-k/m•a•t	só-k/m•o•n	X
	NOUN-CMPR	X	olcsó-bb•a•t	olcsó-bb•o•n	olcsó-bb•u•nk
	NOUN-ADJZ	só-s•a•bb	só-s•a•t	só-s•o•n	só-s•u•nk
	VERB-SBJV/PAST	vár-j/t•a•lak	vár-j/t•a•m	vár-j•o•n	vár-j/t•u•nk
	VERB-NOMZ	--	tart•a•lm•a•k	tart•a•lm•o•n	tart•a•lm•u•nk