

Proliferation of allomorphy induced by harmonic asymmetry: a case of overabundance

Péter Rebrus^{H/E} & Péter Szigetvári^E & Miklós Törkenczy^{E/H}

Hungarian Research Centre for Linguistics & Eötvös Loránd University



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We focus on two phenomena in Hungarian

1. subtypes in vacillation in the harmonic behaviour of stems with back+neutral vowel(s)
2. the harmonic behaviour of ϵ in suffixes

The interaction of these two phenomena results in complex asymmetric patterns of multiple possessive allomorphs.

Claim: there exist two partly independent parallel subsystems

1. a morphologically based **paradigmatic** system that determines the quality of the vowel immediately following the root
2. a phonologically based **harmonic** system that determines the front unrounded/front rounded/back quality of the vowel within suffixes

Harmonizing suffix vowels

| suffix vowels | back stem (B) | front unrounded stem (N) | front rounded stem (F) |
|----------------------|---|--|--|
| o~e~ö [o~ε~ø] | <i>kar-hoz</i> 'arm-ALL' <i>kar-on</i> '-SUE' | <i>vér-hez</i> 'blood-ALL' <i>vér-en</i> | <i>kör-höz</i> 'round-ALL' <i>kör-ön</i> |
| a~e [a~ε] | <i>kar-ak</i> '-DAT' <i>vak-abb</i> 'blind-CMPR' | <i>vér-ek</i> <i>kék-ebb</i> 'blue-CMPR' | <i>kör-ek</i> <i>hűs-ebb</i> 'cold-CMPR' |
| u~ü [u~y] | <i>fá-stul</i> 'tree-SOC' <i>kar-unk</i> '-POSS.1PL' | <i>eké-stül</i> 'plough-SOC' <i>vér-ünk</i> | <i>cipő-stül</i> 'shoe-SOC' <i>kör-ünk</i> |
| ó~õ [o:~ø:] | <i>kar-tól</i> '-ABL' <i>vár-ó</i> 'wait-PRS.PTCP' | <i>vér-től</i> <i>ér-ő</i> 'reach-PRS.PTCP' | <i>kör-től</i> <i>ül-ő</i> 'sit-PRS.PTCP' |

- special property of **e** [ε]: its harmonic counterpart is not unique, it alternates with **o/ö** [o/ø] or with **a** [a] suffix specifically

Front/Back harmony: categorical behaviour and vacillation

| | categorical back (B) | | vacillation (N~B) | | categorical front (N) | |
|---------------------------|-------------------------|-------------------|-------------------------|-------------------------|--------------------------|-----------------|
| C-initial suffixes | <i>kar-hoz</i> | <i>kar-ra</i> | <i>aszpirin-hez/hoz</i> | <i>aszpirin-re/ra</i> | <i>vér-hez</i> | <i>vér-re</i> |
| | <i>sír-hoz</i> | <i>sír-ra</i> | <i>hotel-hez/hoz</i> | <i>hotel-re/ra</i> | <i>hír-hez</i> | <i>hír-re</i> |
| | <i>gallér-hoz</i> | <i>gallér-ra</i> | <i>affér-hez/hoz</i> | <i>affér-re/ra</i> | <i>ebéd-hez</i> | <i>ebéd-re</i> |
| V-initial suffixes | <i>kar-ok</i> | <i>kar-unk</i> | <i>aszpirin-ek/ok</i> | <i>aszpirin-ünk/unk</i> | <i>vér-ek</i> | <i>vér-ünk</i> |
| | <i>sír-ok</i> | <i>sír-unk</i> | <i>hotel-ek/ok</i> | <i>hotel-ünk/unk</i> | <i>hír-ek</i> | <i>hír-ünk</i> |
| | <i>gallér-ok</i> | <i>gallér-unk</i> | <i>affér-ek/ok</i> | <i>affér-ünk/unk</i> | <i>ebéd-ek</i> | <i>ebéd-ünk</i> |

generalisations about *categorical behaviour*:

- mainly (but not exclusively) determined by phonological shape of stem
- no difference between C-initial and V-initial suffixes

Harmonic bias in vacillation: root classes and suffix types

| | no strong preference PLAIN: 'armchair' | front preference CULTURAL: 'partner' | back preference FAMILIAR: 'pal' |
|-------------------------------|--|---|---|
| C-initial suffix (ALL) | N~B <i>fotel-hoz</i> (19.4%) <i>fotel-hez</i> (80.6%) | N~B <i>partner-hoz</i> (1.4%) <i>partner-hez</i> (98.6%) | B~N <i>haver-hoz</i> (91.7%) <i>haver-hez</i> (8.3%) |
| V-initial suffix (PL) | N~B <i>fotel-ok</i> (30.9%) <i>fotel-ek</i> (69.1%) | N <i>*partner-ok</i> (0.02%) <i>partner-ek</i> (99.98%) | B <i>haver-ok</i> (99.55%) <i>*haver-ek</i> ¹ (0.45%) |

source of data: Hungarian Webcorpus (<http://szotar.mokk.bme.hu/szoszablya>)

¹ restricted to some nonreference varieties

Generalizations about harmonic vacillation

- The ratio of harmonic bias is stem and suffix-specific
- Three vacillating stem classes (Forró 2013, Rebrus & Törkenczy 2019, Rebrus et al. 2023):
 - **“cultural”**: C-initial suffixes: front bias, **V-initial suffixes: only front**
 - technical, high-brow words: *partner, kódex, bróker, hardver, modem, vátesz, hosztesz, mágnes* etc.
 - **“familiar”**: C-initial suffixes: back bias, **V-initial suffixes: only back**
 - frequent informal words: *haver* ‘pal’, *fater* ‘father, guv’, *muter* ‘mamma’ etc.
 - diminutive (or so looking) words: *matek* ‘maths’, *maszek* ‘self-employed’, *kolesz* ‘dorm’ etc.
 - **“plain”**: **both harmonic alternants** of C- and V-initial suffixes occur with comparable frequency
 - other words: *fotel* ‘armchair’, *hotel, farmer, moped, sólet* ‘cholent’, *notesz, trapéz, protézis* etc.
 - proper names: *Ágnes, Róbert, Mózes, Olivér, Ozirisz, Martinique* etc.

The productive 3rd person possessive allomorphy in VC-final stems

- Both C- and V-initial allomorphs
 - **yodful**: *-ja~je* 'POSS.3SG' and *-juk~jök* 'POSS.3PL'
 - **yodless**: *-a~e* 'POSS.3SG' and *-uk~ük* 'POSS.3PL'
- Yodful variants behave like C-initial suffixes
 - always harmonic after non-vacillating stems, e.g. *limit-je*, *robot-juk*
 - always vacillating after all vacillating stems, e.g. *haver-ja* ~ *haver-je*, *partner-juk* ~ *partner-jök*
- Yodless variants in productive suffixation are constrained by several factors
 - **general ban on 3SG suffix alternant -a, but -e is allowed**
 - e.g. **robot-a*, **fotel-a*, **haver-a*, **partner-a* vs. *limit-e*, *liter-e*, *dízel-e*, *fotel-e*, *partner-e*
 - the generalisations about vacillating stem classes and V-initial suffixes hold true:
 - no familiar stem + front alternant, e.g. **haver-e*, **haver-ük* (cf. **haver-ek*, **haver-ünk*)
 - no cultural stem + back alternant, e.g. **partner-uk* (cf. **partner-unk*)

3rd POSS forms (productive pattern for non-sibilant-final noun stems)

| | front suffixed stem 'limit' | | back suffixed stem 'robot' | | plain vacillating stem 'cholent' | |
|---|--------------------------------|------------------|-------------------------------|------------------|-------------------------------------|--------------------------------------|
| | 3SG | 3PL | 3SG | 3PL | 3SG | 3PL |
| yodful, front yodful, back | <i>limit-je</i> | <i>limit-jük</i> | <i>robot-ja</i> | <i>robot-juk</i> | <i>sólet-je</i> <i>sólet-ja</i> | <i>sólet-jük</i> <i>sólet-juk</i> |
| yodless, front yodless, back | <i>limit-e</i> | <i>limit-ük</i> | <i>*robot-a</i> | <i>robot-uk</i> | <i>sólet-e</i> <i>*sólet-a</i> | <i>sólet-ük</i> <i>%sólet-uk</i> |
| number of allomorphs | 2 | 2 | 1 | 2 | 3 | 4 |

3rd POSS & the three vacillating stem classes

| | PLAIN no preference ('gravel') | | CULTURAL front preference | | FAMILIAR back preference ('pal') | |
|---|---|--|--|--|---|---|
| | 3SG | 3PL | 3SG | 3PL | 3SG | 3PL |
| | yodful, front yodful, back | <i>sóder-je</i> <i>sóder-ja</i> | <i>sóder-jük</i> <i>sóder-juk</i> | <i>partner-je</i> <i>partner-ja</i> | <i>partner-jük</i> <i>partner-juk</i> | <i>haver-je</i> <i>haver-ja</i> |
| yodless, front yodless, back | <i>sóder-e</i> <i>*sóder-a</i> | <i>sóder-ük</i> <i>sóder-uk</i> | <i>partner-e</i> <i>*partner-a</i> | <i>partner-ük</i> <i>*partner-uk</i> | <i>*haver-e</i> <i>*haver-a</i> | <i>*haver-ük</i> <i>haver-uk</i> |
| number of allomorphs | 3 | 4 | 3 | 3 | 2 | 3 |

3rd POSS forms: a highly asymmetric system (non-sibilant-final stems)

| | | PLAIN | | CULTURAL | | FAMILIAR | | asymmetry in stem class: |
|---------------------------|--------------------------|-----------|------|------------------------|------|------------------------------------|------|--------------------------------------|
| | | front | back | front | back | front | back | |
| 3SG | yodless (-e~a) | + | - | + | - | - | - | -e : -e : *-e |
| | yodful (-je~ja) | + | + | + | + | + | + | |
| 3PL | yodless (-ük~uk) | + | + | + | - | - | + | -ük : -ük : *-ük -uk : *-uk : -uk |
| | yodful (-jük~juk) | + | + | + | + | + | + | |
| asymmetry in harmonicity: | | -e : *-a | | -e : *-a; -ük : *-uk | | *-ük : -uk | | |
| asymmetry in yodfulness: | | *-a : -ja | | *-a : -ja; *-uk : -juk | | *-e : je; *-a : -ja *-ük : -jük | | |
| asymmetry in number: | | *-a : -uk | | - | | *-a : -uk | | |

3rd POSS forms: sibilant/palatal-final stems

- phonotactic restriction: yodful allomorphs do not occur after sibilant/palatal-final stems:
**termesz-je, *fókusz-ja, *notesz-ja/je*
- both (front and back) harmonic yodless alternants are available
 - front harmonic stems: e.g. *termesz-e, fez-e, percec-e*
 - back harmonic stems: e.g. *fókusz-a, fruktóz-a*
 - **all** vacillating stems show vacillation:
notesz-a/e (plain), *vátesz-a/e*, *-uk/ük* (cultural), *kolesz-a/e*, *-uk/ük* (familiar)

3rd POSS forms of sibilant-final stems are a symmetric system

| | | PLAIN | | CULTURAL | | FAMILIAR | |
|---|---------|-------------------------------|------|--|------|--|-------------------------------|
| | | front | back | front | back | front | back |
| 3SG | yodless | + | + | + | + | + | + |
| | yodful | - | - | - | - | - | - |
| 3PL | yodless | + | + | + | + | + | + |
| | yodful | - | - | - | - | - | - |
| examples (contrasted with non-sibilant-final stems) | | <i>notesz-a</i> (*sóder-a) | | <i>vátesz-a</i> (*partner-a) <i>vátesz-uk</i> (*partner-uk) | | <i>kolesz-e</i> (*haver-e) <i>kolesz-ük</i> (*haver-ük) | <i>kolesz-a</i> (*haver-a) |

Asymmetries in five dimensions

Corresponding potential allomorphs may not all occur. Asymmetries in:

- **harmonicity**: front and back (4 asymmetrical pairs)
 - e.g. *fotel-e* vs. **fotel-a*; *haver-uk* vs. **haver-ük*
- **yodfulness**: yodless and yodful (6 asymmetrical pairs)
 - e.g. *partner-ja* vs. **partner-a*; *haver-je* vs. **haver-e*
- **number of possessor**: 3SG and 3PL (2 asymmetrical pairs)
 - e.g. *haver-uk* (3PL) vs. **haver-a* (3SG)
- **stem class**: PLAIN, CULTURAL and FAMILIAR (6 asymmetrical pairs)
 - e.g. *fotel-e* (plain) vs. **haver-e* (fam.); *haver-uk* (fam.) vs. **partner-uk* (cult.)
- **stem-final consonant**: sibilant-final and other (6 asymmetrical pairs)
 - e.g. *notesz-a* vs. **fotel-a* (both plain); *kolesz-ük* vs. **haver-ük* (both fam.)

Analysis: paradigmatic uniformity effects

- **Possessive paradigmatic licensing (POSSLIC; Rebrus et al 2017)**
 - scope: within the possessive subparadigm; directional: 3rd person target
 - **If linking vowel is low/high elsewhere in the paradigm, then 3rd person possessive yodless allomorph is licensed:**
 - 1/2SG: *-em/-ed* ⇒ 3SG: *-e* (and 1/2SG: *-am/-ad* ⇒ 3SG: *-a*)
 - 1PL: *-ünk* ⇒ 3PL: *-ük* and/or 1PL: *-unk* ⇒ 3PL: *-uk*
- **Harmonic Uniformity (HARUNI; Rebrus & Szigetvári 2016, Rebrus & Törkenczy 2017, 2021)**
 - **the harmonic class is constant throughout the (extended) paradigm of the root**
 - applies at the level of morphemes (*paradigm cells*), not of individual morphs
 - violated in the “cultural” and “familiar” vacillating stem classes, where forms with V-initial vs. C-initial suffixes systematically show harmonically different behaviour within the paradigm

Uniformity in the possessive paradigm: PossLIC at work

| person ↓ number→ | | front suffixed stem | | back suffixed stem | | plain vacillating stem | | |
|---------------------|---------|---------------------|-------------------|--------------------|-------------------|-----------------------------------|---------------------------------------|-------------------------------------|
| | | SG | PL | SG | PL | SG | PL | |
| 2 | | <i>limit-ed</i> | <i>limit-etek</i> | <i>robot-od</i> | <i>robot-otok</i> | <i>sólet-ed</i> ~ <i>sólet-od</i> | <i>sólet-etek</i> ~ <i>sólet-otok</i> | |
| 1 | | <i>limit-em</i> | <i>limit-ünk</i> | <i>robot-om</i> | <i>robot-unk</i> | <i>sólet-em</i> ~ <i>sólet-om</i> | <i>sólet-ünk</i> ~ <i>sólet-unk</i> | |
| | | ↓ | ↓ | ‡ | ↓ | ↓ | ‡ | |
| 3 | yodless | <i>limit-e</i> | <i>limit-ük</i> | * <i>robot-a</i> | <i>robot-uk</i> | <i>sólet-e</i> | * <i>sólet-a</i> | <i>sólet-ük</i> ~ % <i>sólet-uk</i> |
| 3 | yodful | <i>limit-je</i> | <i>limit-jük</i> | <i>robot-ja</i> | <i>robot-juk</i> | <i>sólet-je</i> ~ <i>sólet-ja</i> | <i>sólet-jük</i> ~ <i>sólet-juk</i> | |

Possessive paradigm: PossLIC & vacillating stem classes

| person ↓ number→ | plain stem (linking vowel: -e/o-; -ü/u-) | | cultural stem (linking vowel: -e-; -ü-) | | familiar stem (linking vowel: -o-; -u-) | |
|---------------------|--|--|--|--|--|--|
| | SG | PL | SG | PL | SG | PL |
| 2 | sóder- ed sóder-od | sóder-etek sóder-otok | partner- ed *partner-od | partner-etek *partner-otok | *haver-ed haver-od | *haver-etek haver-otok |
| 1 | sóder- em sóder-om | sóder- ü nk sóder- u nk | partner- em *partner-om | partner- ü nk *partner-unk | *haver-em haver-om | *haver-ünk haver- u nk |
| 3 | yodless ↓ sóder- e *sóder- <u>a</u> | ↓↓ sóder- ü k sóder- u k | ↓ partner- e *partner- <u>a</u> | ↓ partner- ü k *partner- <u>u</u> k | ‡ *haver- <u>e</u> *haver- <u>a</u> | ↓ *haver- <u>ü</u> k haver- u k |
| 3 | yodful sóder-je sóder-ja | sóder-jük sóder-juk | partner-je partner-ja | partner-jük partner-juk | haver-je haver-ja | haver-jük haver-juk |

Other effects

- **Alignment**

- productive pattern: yodful (Papp 1975, Kiefer 1985, Rebrus et al. 2017)
ALIGN(μ, σ): align the right edge of the stem with a syllable boundary, e.g. *nap.-ja*, **na.p-a*
- variation: POSSLIC-licensed yodless allomorphs also occur, e.g. *bit-je* ~ *bit-e* (cf. *bit-em*), Ittzés 2023

ALIGN(μ, σ), POSSLIC are unranked

- ***Sibilant+j**

- yodful allomorph is banned after palatals/sibilants, e.g. **hús-ja*, *hús-a* (cf. *hús-om*)
***S+j** >> ALIGN(μ, σ), POSSLIC
- POSSLIC-**unlicensed yodless allomorph occurs in order to satisfy HARUNI (vacillation)**, e.g. *notesz-e* (licensed) ~ *notesz-a* (not licensed)
HARUNI >> ALIGN(μ, σ), POSSLIC

- ***Hiatus**

- V#-stems: no linking V and POSS.3 is yodful, e.g. *kapu-m* (**kapu-om*), *kapu-ja* (**kapu-a*)
***V.V** >> ALIGN(μ, σ), POSSLIC

The possessive paradigm of sibilant-final vacillating stems: HARUNI at work

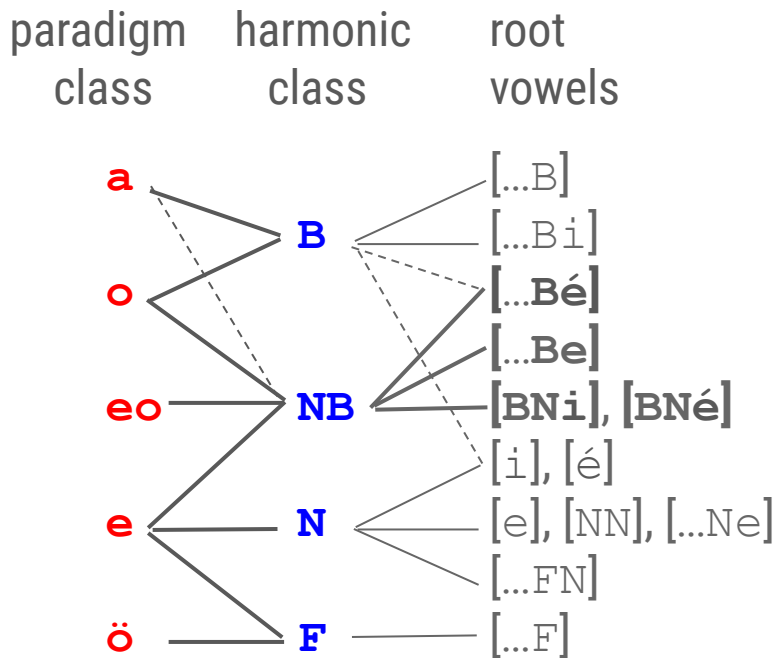
| person ↓ number→ | plain stem (linking vowel: -e/o-, -ü/u-) | | cultural stem (linking vowel: -e-, -ü-) | | familiar stem (linking vowel: -o-, -u-) | |
|---------------------|---|--|--|---------------------------------------|--|---------------------------------------|
| | SG | PL | SG | PL | SG | PL |
| 2 | <i>notesz-ed</i> <i>notesz-od</i> | <i>notesz-etek</i> <i>notesz-otok</i> | <i>vátesz-ed</i> | <i>vátesz-etek</i> | <i>kolesz-od</i> | <i>kolesz-otok</i> |
| 1 | <i>notesz-em</i> <i>notesz-om</i> | <i>notesz-ünk</i> <i>notesz-unk</i> | <i>vátesz-em</i> | <i>vátesz-ünk</i> | <i>kolesz-om</i> | <i>kolesz-unk</i> |
| 3 | ↓ † yodless | ↓ ↓ | ↓ † | ↓ † | † † | † ↓ |
| | <i>notesz-e</i> <i>notesz-a</i> | <i>notesz-ük</i> <i>notesz-uk</i> | <i>vátesz-e</i> <i>%vátesz-a</i> | <i>vátesz-ük</i> <i>%vátesz-uk</i> | <i>%kolesz-e</i> <i>kolesz-a</i> | <i>%kolesz-ük</i> <i>kolesz-uk</i> |
| 3 | yodful | | | | | |
| | — | — | — | — | — | — |

Suffix vocalism: the difference between C- and V-initial suffixes

Two subsystems that govern the quality of suffix vowels in Hungarian:

1. Phonological (vowel harmony): **harmonic class** of the stem
 - mainly predictable from the vocalism of the stem
 - specifies the vowel quality of **harmonizing suffixes**: **Back**, front unrounded (**N**) or **Front rounded**
 - several effects wrt. neutral vowels (anti-harmony, transparency: Hayes & Cziráky Londe 2006)
2. Morphological (linking vowel): **paradigm class** of the stem
 - not predictable from the vocalism (“lowering” stems, “cultural/familiar” stems)
 - **linking vowels**: labelled by **-o-**, **-a-**, **-e-**, **-ö-**, **-eo-**
 - arbitrary classes of stems (tend to be categorical)
 - dominated by Front/Back harmony

Correspondences between paradigm, harmony and root vowels



in roots:

B={a, o, u}

N={i, é, e}, where é=[e:] e=[ɛ]

F={ü, ö}

Summary

Two subsystems:

- (1) specific: paradigmatic (the quality of the vowel immediately following the stem)
- (2) general: phonological (harmonic class)
 - (1) cannot contradict (2) in front/back harmony (e.g. *oN, *eB)
 - (1) is more specific and thus reduces the bias of linking vowels (e.g. *eoN, *eoB)

Consequences:

- partially unpredictable linking vowel (e.g. the subclasses of vacillating stems)
- the asymmetric behaviour of 3rd person possessive forms (⇒ proliferation of overabundance)
- this asymmetry is eliminated by Harmonic Uniformity

References

- Forró, Orsolya. 2013. Ingadozás a magyar előlségi harmóniában. Szempontok a variabilitás szinkroniájának és diakroniájának feltárásához és értelmezéséhez. PhD dissertation. Pázmány Péter Catholic University, Piliscsaba.
- Hayes, Bruce—Zsuzsa Cziráky Londe. 2006. Stochastic phonological knowledge: The case of Hungarian vowel harmony. *Phonology* 23: 59–104.
- Ittész Ambrus (2023): A főnévi birtokjelölés váltakozása a magyarban. BA Thesis. Eötvös Loránd University, Budapest.
- Kiefer, Ferenc. (1985). Natural Morphology. *Acta Linguistica Hungarica* 35: 85–105.
- Rebrus, Péter—Péter Szigetvári. 2016. Diminutives: Exceptions to Harmonic Uniformity. *Catalan Journal of Linguistics* 15: 101–119.
- Rebrus, Péter—Miklós Törkenczy. 2017. Co-patterns, subpatterns and conflicting generalizations in Hungarian vowel harmony. In: Harry van der Hulst and Anikó Lipták (eds.), *Approaches to Hungarian*, vol. 15: Papers from the 2015 Leiden Conference. Amsterdam and Philadelphia: John Benjamins. 135–156.
- Rebrus, Péter—Törkenczy Miklós. 2019. Magyar harmónia: a dolgok állása. *Általános Nyelvészeti Tanulmányok XXXI*:233–333.
- Rebrus, Péter—Miklós Törkenczy. 2021. Harmonic Uniformity and Hungarian front/back harmony. *Acta Linguistica Academica* 68/1–2:175–206.
- Rebrus, Péter—Péter Szigetvári—Miklós Törkenczy. 2017. Asymmetric variation. In: *Sonic signatures*, Geoff Lindsey and Andrew Nevins (ed.) John Benjamins Publishing Company. 163–187.
- Rebrus, Péter—Péter Szigetvári—Miklós Törkenczy. 2023. How Morphological is Hungarian Vowel Harmony? In: *Proceedings of the 2022 Annual Meeting on Phonology*, Noah Elkins—Bruce Hayes—Jinyoung Jo—Jian-Leat Siah (ed.) Washington, DC: Linguistic Society of America. 1–10.

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