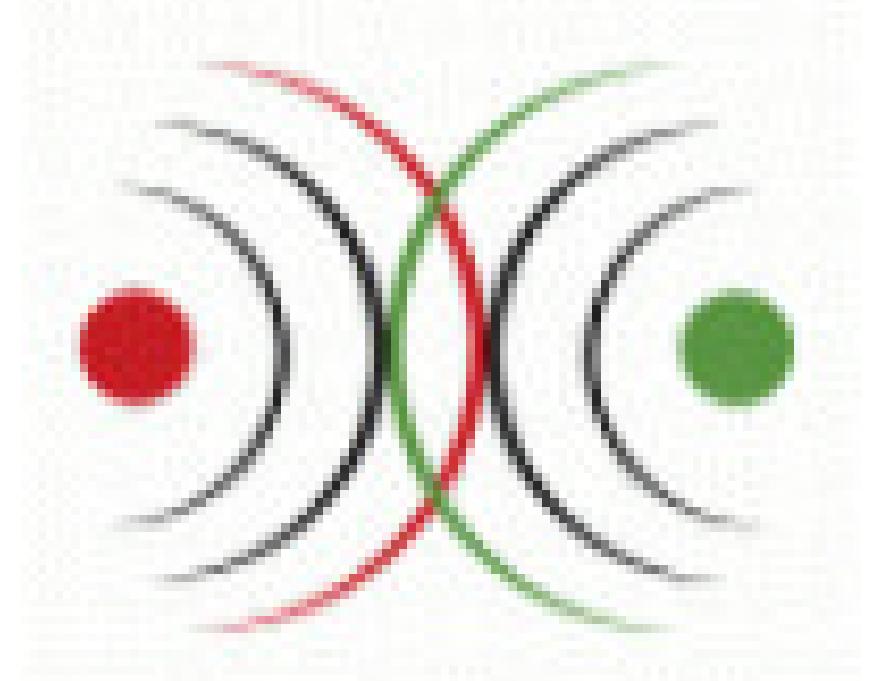# The paradigm in Hungarian vowel harmony

## Péter Rebrus, Péter Szigetvári, Miklós Törkenczy

Eötvös Loránd University / Research Centre for Linguistics, Budapest

rebrus@nytud.hu, szigetvari@elte.hu, tork@nytud.hu

## 1 Morphologised vowel harmony (VH) systems

- **Morphologisation** is the degree of morphological conditioning (it is gradient)
  - "Baseline" = domain of harmony: all VH systems circumscribe VH domains (partially or completely) morphologically: root, stem, phonological word, etc. — sometimes (also) syntactically: phrase, e.g. Kinande, Akan (Downing 2018)
- Morphologisation above the baseline
  - **lower end of the scale**: in "simple" dominant-recessive systems VH trigger is purely phonologically identified, e.g. Karajá, Kalenjin
  - intermediate: various kinds and mixtures of morphological conditioning, stem/root control (e.g. Finnish, Chichewa) but also some dominant-recessive systems (e.g. Kinande, Maasai)
  - **higher end of the scale**: harmonic classes are paradigm classes (∼inflectional classes) e.g. Hungarian (this talk), Uyghur (Mayer 2021)

## 2 What makes VH morphologised?

- the inconsistency of VH within the domain: morphologically simplex and complex forms behave differently harmonically
  - root-stem asymmetries (kanyl 'canula' vs. *bask-yl 'in Basque')
  - other effects overriding VH (martini-nak/nεk 'martini-DAT' vs. martin-i-nak/*nεk 'Martin-ADJZ-DAT')
- lexical conditioning
  - roots: keːj-rɔːl 'lust-DEL' vs. heːj-rɔːl 'peel-DEL'
  - affixes: TRA tøbb-e: 'more', jobb-a: 'better' vs. POSR øːs-e: 'autumn-POSR', ɲaːr-e: 'summer-POSR'
  - whole word-forms (root+affix): havεr-ok/*εk 'pal-PL' vs. havεr-nak/nεk 'pal-DAT'
- paradigm-based restrictions
  - paradigmatic uniformity effects (overriding front/back harmony)
  - paradigmatic contrast effects (overriding front/back harmony) – not discussed in this talk
  - paradigm classes (overriding rounding harmony)

## 3 Hungarian vowel harmony (HVH)

### 3.1 The traditional myths

- Front/back: int-ynk 'wave-1PL', ønt-ynk 'pour-1PL', ont-unk 'shed-1PL'
- Rounding (parasitic on front): int-εk 'wave-1SG', ønt-øk 'pour-1SG', ont-ok 'shed-1SG'
- Categorical neutrality: neutral vowels are always transparent
  papiːr-ok 'paper-PL', taːpeːr-ok 'plate-PL' (havεr-ok 'pal-PL' vs. kompjuːtεr-εk 'computer-PL'?)
- No harmony−morphology interaction: morphologically simplex and complex forms behave in the same way harmonically within the domain of harmony: papiːr-ok, vak-iːt-ok 'blind-VRBZ-1SG'

### 3.2 "Exceptions"

- Antiharmonic roots (lexical variation)
  - irt-unk 'eradicate-1PL', tse:l-unk 'goal-1PL.POSS', ʃpejz-unk 'pantry-1PL.POSS'
    sirt-ynk 'cliff-1PL.POSS', e:l-ynk 'live-1PL', ʃpejz-ynk 'pantry-1PL.POSS'
- Vacillation and lexical variation in transparency/opaqueness
  - [Be:] vacillating: both F and B (norvε:g-ynk/unk 'Norwegian-1PL.POSS')
    transparent: only B (taːpeːr-*ynk/unk 'plate-1PL.POSS')
  - [Bε] vacillating: both F and B (ʃoːdεr-ynk/unk 'gravel-1PL.POSS')
    transparent: only B (havεr-*ynk/unk 'pal-1PL.POSS')
    opaque: only F (kompjuːtεr-ynk/*unk 'computer-1PL.POSS')
- "Lowering" wrt rounding harmony
  - fyl-εk 'ear-PL', øt-øд-εt 'five-2SG.POSS-ACC' vs.
  - ʃyl-øk 'porcupine-PL', øt-øд-øt 'five-FRAC-ACC'

### 3.3 Traditional analyses of "exceptions"

- Antiharmony/lowering can be encoded in the representation (phonologised)
  - abstract vowels + absolute neutralisation,
  - floating features + licensing conventions, etc.
- For vacillating roots several different "underlying" vowels/representations would be needed, e.g. three(!) for /ε/ ⊘
  - transparent (in havεr)
  - vacillating (in ʃoːdεr)
  - opaque (in kompjuːtεr)
- Domain-internal morphological complexity cannot be phonologised ⊘⊘⊘
  - monomorphemic martini-nak/nεk
  - polymorphemic martin-i-nak/*nεk

## 4 What determines harmonic classes?

| | B-class | F-class | B/F-class |
|---|---|---|---|
| no variation | [...B] | [...F], [...FN] | |
| only lexical variation | [N] | [N], [NN] | |
| lex. var. & vacillation | [...Bi(ː)], [...Be:]FAM, [...Bε]FAM, [BNN']FAM | [BNε], [...Bε]CULT | [...Be:]PL, [...Bε]PL, [BNN']PL |

legend: B={u(ː), o(ː), a(ː)}, F={y(ː), ø(ː)}, N={i(ː), e:, ε}, N'={i(ː), e:}; FAM=familiar loan, CULT=cultural loan, PL=plain loan

- no variation: phonology determines harmonicity;
- only lexical variation (= antiharmony): underdetermined but no vacillation;
- lexical variation & vacillation (transparency/opaqueness): highly underdetermined.

Harmonic classes are co-determined by

1. phonological shape (vocalic pattern) of the stem
2. word class of the stem (hyʃ-εk 'cool(adj)-PL' vs. høʃ-øk 'hero(noun)-PL')
3. meaning of the stem ("familiar": havεr-*ynk/unk, "plain": ʃoːdεr-ynk/unk, "cultural": kompjuːtεr-ynk/*unk)
4. degree of nativization of the stem ("native": taːpeːr-ok/*εk, recent loan: norvε:g-ok/εk)
5. token frequency of the stem (native but rare: gaːtʃεːr-nak/?nεk 'drake-DAT', not familiar loan but frequent: konkreːt-ak/?εk 'specific-PL')

## 5 The paradigmatic view of HVH

Class membership co-determined by properties like those in §4 is characteristic of paradigm classes ⟶ paradigmatic view of HVH. Advantages:

- phonologically underdetermined classes (§4)
- harmonic uniformity of paradigmatically related forms (Harmonic Uniformity, §5.1)
- other paradigmatic effects
  - Paradigm Uniformity within POSS (§5.2)
  - (paradigmatic contrast: not discussed in this talk)
- thematic vowels ("lowering", §6)

### 5.1 Harmonic Uniformity (HarUni)

(Rebrus & Szigetvári 2016, Rebrus & Törkenczy 2017; 2019, 2021, Rebrus et al. 2017)

- HarUni: All the harmonic suffixes have identical harmonic values (F, B or B/F) within the extended paradigm of a root.
- Inhibition of phonologically conditioned variation by HarUni
  - Phonological conditioning of variation due to the limitation of transparency (Hayes & Cziráky Londe 2006)
    * Height Effect (i(ː) > e: > ε): martin-nak/*nεk vs. norvε:g-nak/nεk, ʃoːdεr-nak/nεk
    * Count Effect (BN > BNN): martinik-nak/nεk vs. martinik-nak/nεk, proteːziʃ-nak/nεk
  - HarUni: martinik-i-nak/nεk (⇐ martinik-nak/nεk ...) vs. martin-i-nak/*nεk (⇐ martin-nak/*nεk ...)
- Maintenance of lexical variation by HarUni despite phonological inhibition
  - Phonological constraint on lexical variation (antiharmony): ind-ul 'start-VRBZ', tse:l-unk 'goal-1PL.POSS'; but Polysyllabic Split (PSS): *[NN⁺]B
  - HarUni: ind-iːt-hat 'start-VRBZ-POT' (∼ind-ul ...), tse:l-e:-ra 'goal-POSR-SUBL' (∼tse:l-unk ...), contra PSS

### 5.2 Paradigm Uniformity within POSS of loan roots (PUPOSS)

(Rebrus et al. 2017)

1. The yodless alternant of 3SG/PL.POSS is available only if its vowel appears as a linking vowel in the paradigm:
   a. 'star/geyser-1/2SG' vs. '-3SG' sta:r-om/od ⊁ sta:r-*(j)a gεjziːr-εm/εd ∼ gεjziːr-(j)ε
   b. 'star/geyser-1PL' vs. '-3PL' sta:r-unk ∼ sta:r-(j)uk gεjziːr-ynk ∼ gεjziːr-(j)yk
   c. vacillating roots ʃoːdεr-om/od ⊁ ʃoːdεr-*(j)a ʃoːdεr-εm/εd ∼ ʃoːdεr-(j)ε 3/4
   d. vacillating roots ʃoːdεr-unk ∼ ʃoːdεr-(j)uk ʃoːdεr-ynk ∼ ʃoːdεr-(j)yk 4/4
2. Familiar roots: mostly back linking vowels:
   a. 1/2SG vs. 3SG havεr-om/od ⊁ havεr-*(j)a havεr-εm/εd havεr-*(j)ε 2/4
   b. 1PL vs. 3PL havεr-unk ∼ havεr-(j)uk havεr-ynk havεr-*(j)yk 3/4
3. PUPOSS is dominated by the phonological constraint *Sib+j but Harmonic Uniformity operates actively
   a. stable roots ('fax') faks-om/od ⊁ faks-a
   b. vacillating roots ('notebook') notεs-om/od ⊁ notεs-a notεs-εm/εd ∼ notεs-ε 2/4

### 5.3 Asymmetrical vacillation

| | plain loan roots | | familiar roots | | sibilant-final roots | |
|---|---|---|---|---|---|---|
| 3PL.POSS | *-yk | | *-yk | | *-j- | |
| | ʃoːdεr-uk ʃoːdεr-yk | | havεr-uk *havεr-yk | | notεs-uk notεs-yk | |
| | ʃoːdεr-juk ʃoːdεr-jyk | | havεr-juk havεr-jyk | | *notεs-juk *notεs-jyk | |
| 3SG.POSS | *-a | | *-a/ε | | *-j- | |
| | *ʃoːdεr-a ʃoːdεr-ε | | *havεr-a *havεr-ε | | notεs-a notεs-ε | |
| | ʃoːdεr-ja ʃoːdεr-jε | | havεr-ja havεr-jε | | *notεs-ja *notεs-jε | |

HarUni enforces vacillation (overriding PUPOSS) in notεs-a/-ε.

## 6 Harmonic class and thematic vowel ("lowering")

The mapping between harmonic class (back: B, front rounded: F_R, front unrounded: F_U, vacillating: B/F_U) and the quality of the thematic vowel (-o-, -ø-, -ε-, -o/ε-) is not bi-unique.

- The harmonic class does not uniquely determine the thematic vowel:
  - B & -o-: dal-ok vs. B & -a-: fal-ak
  - F_R & -ø-: ʃyl-høz, ʃyl-øk vs. F_R & -ε-: fyl-høz, fyl-εk
  - B/F_U & -o/ε-: ʃoːdεr-hoz/-hεz, ʃoːdεr-ok/-εk vs. B/F_U & -o-: havεr-hoz/hεz vs. havεr-ok/*-εk
- The thematic vowel does not uniquely determine the harmonic class:
  - -o- & B: dal-ok, dal-hoz vs. -o- & B/F_U: havεr-ok, havεr-hoz/hεz
  - -ε- & F_U: jεl-εk, jεl-hεz vs. -ε- & F_R: fyl-εk, fyl-høz

Paradigmatic classes of stems by the thematic vowel

| paradigmatic class | -o- class | -a- class | -ε- class | -ø- class | -o/ε- class |
|---|---|---|---|---|---|
| thematic vowel | mid | low | low | mid | mid/low |
| harmonic class | B or B/F_U | B | F_U or F_R | F_R | B/F_U |
| root vowels | [B], [N'], [BN], [BNN'] | [B], [N'] | [FN], [N], [F], [Bε], [BNε] | [F] | [BN], [BNN'] |
| examples (-PL) | dal-ok, ʃiːr-ok, tse:l-ok, havεr-ok | fal-ak, ɲil-ak, he:j-ak | fyl-εk, jεl-εk, hiːr-εk, be:r-εk | ʃyl-øk, kør-øk | kareːl-ok/εk, hotel-ok/εk, aspirin-ok/εk |

## 7 Summary

Because of the high degree of phonological underdeterminedness of the harmony patterns an account of

- HVH including variation (lexical vacillation)
- its interaction with other morphophonological phenomena
- the distribution of thematic vowels

must make reference to **paradigms**.

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