

# HUNGARIAN EVIDENCE FOR ABSTRACT PHONOLOGY

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The *Sound Pattern of English* allows three means for dealing with phonological irregularities where apparently similar surface forms are treated differently by some phonological rule. The first is to distinguish the irregular forms by positing ABSTRACT UNDERLYING SEGMENTS in them, that are later ABSOLUTELY NEUTRALIZED, i.e., unconditionally merged with some phonetically realized segment. The second is the use of RULE FEATURES to mark exceptions to a rule. The third is to associate quasi-phonological DIACRITIC FEATURES with entire morphemes, which are later mapped onto true phonological features.

There are many examples that show that this apparatus is too powerful. In *How Abstract is Phonology?* Kiparsky sought to constrain it by the ALTERNATION CONDITION, which rules out the first and third of these — abstract segments and diacritic features — and claims that rule features are the only appropriate means to handle such irregularities. However, several recent papers, especially Kisseberth (1969) and Hyman (1970), have shown that this constraint is too strong in that it rules out otherwise well motivated analyses. In this paper, I present similar data from Hungarian, and suggest the appropriate weakening of the Alternation Condition.

In Hungarian, the vowels of a root must agree in backness, and the vowels of suffixes must agree in backness with the root vowels. Normally, a suffix has two forms, one to agree with back vowel words and one to agree with front vowel words. Example (1) shows the operation of vowel harmony with the dative suffix *nak nek*:

1. *nak/nek* 'to'  
*ház* 'house'            *háznak*  
*cső* 'tube'              *csőnek*

Example (2), with the same nouns and the delative suffix *ról ről*:

2. *ról/ről* 'from off of'  
*háztól*  
*csőtől*

However, there are also NEUTRAL VOWELS *i* and *e* that may appear with either front or back vowels. When a root contains both neutral and nonneutral vowels, the

nonneutral vowels determine the vowels of the suffixes, as in (3), back vowel words,<sup>1</sup> and (4), front vowel words.

3. *játék* 'game' *játéknak*  
*bika* 'bull' *bikának*  
*példa* 'example' *példának*
4. *művész* 'artist' *művésznak*  
*körív* 'bow' *körívnek*  
*rendőr* 'policeman' *rendőrnek*

But a root containing only neutral vowels may take back vowel suffixes, as in the first two examples in (5), or it may take front vowel suffixes as in the last two examples in (5).

5. *hid* 'bridge' *hidnak* *víz* 'water' *víznek*  
*héj* 'rind' *héjnak* *vér* 'blood' *vérnek*

Whether a neutral-vowel word takes front or back vowel suffixes is apparently arbitrary for these roots. I will discuss this phenomenon in relation to the three ways that *Sound Pattern of English* (Chomsky and Halle 1968) allows for handling such cases.

Kiparsky's analysis of Hungarian, based on the Alternation Condition, assumes that all suffixes have back or neutral vowels in underlying form, as required by his version of Markedness Theory. He formulates VOWEL HARMONY as a FRONTING RULE: suffix vowels become front if the last nonneutral vowel of the root is front; otherwise they remain unchanged. Only affix harmony is subject to this rule: morpheme-internal harmony is the result of a separate morpheme structure condition.

But a class of pronominal forms suggests that some suffixes have underlying front vowels. Personal pronouns do not behave the same as nouns with case suffixes: the suffix is not merely attached to the pronoun. Instead, the suffix itself is used as a root to which personal endings are attached, similar in form to the personal endings used with verbs. The personal pronoun may optionally precede, as a separate word, as shown in (6).

6. (*én*) *nekem* (*én*) *rólam*  
*\*énnek* *\*énnek* *\*énról* *\*énről*

In these personal forms the suffix has a backness of its own: *nek* always appears with front vowel, *ról* always with back vowel. The personal pronoun, whether present or not, has no effect on the backness of the vowels in the personal forms. Since the suffix vowel is predictable when it is a suffix, but not when it is a root, simplicity requires that the nonpredictable form — the one used with personal endings — be entered in

<sup>1</sup> The lengthened vowel of *bikának*, *példának*, is due to a general rule that lengthens *a* and *e* before suffixes.

the lexicon. This analysis makes it impossible to maintain the strong form of the alternation condition, which depends on all suffixes having underlying back or neutral vowels. The derivation (7) shows that *hid* behaves as Kiparsky predicts when back-vowel suffixes are attached to it.

7. /*hid* + *ról*/ → *hidról*  
 [-VH]

But the derivation (8) shows that incorrect forms are generated with front-vowel suffixes like *nek*.

8. /*hid* + *nek*/ → \**hidnek* → *hidnak* (rule 9)  
 [-VH]

In order to generate the correct form *hidnak* and also preserve the Alternation Condition, we must add a rule like (9), ordered after Vowel Harmony, that makes front suffixes back if added to a root that is marked as an exception to Vowel Harmony.

9. [+Voc] → [+back]/[[-VH]] X

While this rule would produce the correct forms, it would certainly be a strange way to preserve the Alternation Condition, one of whose main virtues Kiparsky claimed to be that of 'hugging the phonetic ground'! But if we reject the alternation condition, we gain an alternative solution which is simple and natural. We can now distinguish *hid* and *víz* by using the abstract vowel /*u*/ in the underlying form of *hid* as shown in (10).

10. Underlying forms /*hu*d/ /*v*íz/ /*n*æk/ /*r*ól/

Vowel Harmony will be formulated as an alpha-rule that will back front-vowel suffixes after back-vowel roots, and front back-vowel suffixes after front-vowel roots. A later rule of absolute neutralization will convert all occurrences of /*u*/ to [i]. The final formulation of vowel harmony is seen in (11).

11. Vowel Harmony  $V \rightarrow [\alpha\text{back}]/C_0 \left[ \begin{matrix} V \\ \alpha\text{back} \end{matrix} \right] C_0$  — (L-R iterative)

However, Kiparsky had a valid objection to abstract underlying segments: it is always possible to find an arbitrary 'vacant slot' to serve as the environment of some rule on exceptional forms, which can later be absolutely neutralized. But my abstract vowels are not chosen arbitrarily: they use only features needed for the other vowels of Hungarian. This is seen in my postulated underlying vowel system in (12).

12. Underlying vowel system

	a	i	u	e	o	ü	ö	ɯ	ʌ	æ				
back	+	—	+	—	+	—	—	+	+	—	i	ü	ɯ	u
high	—	+	+	—	—	+	—	+	—	—	e	ö	ʌ	o
low	+	—	—	—	—	—	—	—	—	+	æ	a		
round	—	—	+	—	+	+	+	—	—	—				

The use of diacritic features was once a very popular way of explaining things like vowel harmony. I will mention three objections to this solution which have not been proposed before to my knowledge. First, my analysis of Hungarian shows that suffixes must have their own backness. In the diacritic solution they would have to have their own diacritic marking, which would have to assimilate to the diacritic marking of the root. It seems strange to explain what is really a phonological assimilation by an assimilation of abstract features. Second, the diacritic solution cannot handle those foreign words which are exceptions to morpheme-internal vowel harmony, such as (13).

13. *sofőr* < Fr chauffeur

No diacritic feature can apply to this entire word. Finally, the claim that marking only one vowel in each root is necessarily arbitrary is not correct. In monosyllabic roots, there is no arbitrariness. In polysyllabic roots, only the first or last vowel can be marked, since a formula such as 'mark the third vowel from the end of the root' must be modified arbitrarily for roots of fewer than three syllables. If the last vowel is marked, vowel harmony is stated as (14) with a mirror-image environment.<sup>2</sup>

14.  $V \longrightarrow [\alpha \text{back}] // \left[ \begin{array}{c} V \\ \alpha \text{ back} \end{array} \right] C_0 \text{---} \quad (\text{iterative})$

But with this rule it is impossible to formally specify the last vowel in the root. Even the addition of a + boundary, as in (15), doesn't help, since this would only work with monosyllabic roots and suffixes, and anyway the + boundary could as well belong to a suffix. Thus there is no arbitrariness: the only solution that works is that where the first vowel of each morpheme is marked for backness, and vowel harmony is stated as (11).

15.  $V \longrightarrow [\alpha \text{back}] // \left[ \begin{array}{c} V \\ \alpha \text{ back} \end{array} \right] C_0 + C_0 \text{---} \quad (\text{iterative})$

My argument for adopting the abstract vowel solution in Hungarian takes two forms: (1) The abstract segments fill otherwise unexplained gaps in the underlying phonological system and (2) adopting the strong form of the Alternation Condition leads to counterintuitive results and intolerably complicates the grammar. When both these conditions hold, phonological theory should REQUIRE, not merely permit, the abstract solution, since we want a unique solution in every case. When neither of these conditions holds, abstract segments are not permitted, by the weak form of the Alternation Condition. It remains for a sufficiently sensitive phonological theory to be developed to determine whether or not to admit abstract segments in cases where only one of these conditions holds.

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<sup>2</sup> The notation // for mirror image environment is due to Harris (1970).

## REFERENCES

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## DISCUSSION

ANTTILA (Los Angeles)

What is the number of words like *híd*? If it is small, wouldn't the English umlaut plurals be a parallel. How would you treat them?

JENSEN

English umlaut plurals are handled most naturally with rule exception features, but, as I have shown, words like *híd* cannot be handled this way. Both rule features and abstract segments are required in phonological theory. Rule exceptions are better suited to morpheme-internal vowel harmony such as *sofőr*.

BOND (Columbus, Ohio)

How do you justify the specific abstract vowels that you set up? I think that [u], particularly, is a rather rare vowel in the languages of the world.

JENSEN

Although [u] is not common in languages of the world, it differs from [i] only in the feature [back] and thus fills a gap in the underlying phonological system. The choice of any other vowel would be *ad hoc* and would unduly complicate the grammar. One of Kiparsky's main objections to abstract vowels is your very point that there are many 'vacant slots' to choose from. However, as I have shown, I have chosen my abstract vowels on a principled basis: namely, that they fill systematic gaps.

DEARMOND (Burnaby, B.C.)

Although historical development is not directly relevant to synchronic analysis, has Hungarian ever distinguished diachronically [u] from [i], and [a] from [æ]?

In answer to Anttila's comment that the underlying distinction between them which occurred in the surface forms in Proto-Finno-Ugric times should have been lost: there is evidence that certain systematic rules have been maintained in languages for very long periods of time; it is not unreasonable to assume that such forms may

remain systematically opposed, i.e., if it remains as part of a general development or trend in a language, even though such forms have been neutralized in the surface grammar for a long period of time.

## JENSEN

Apparently Proto-Finno-Ugric had phonetic /u/, which has been lost in the modern languages. I know of no historical evidence for [æ] but many contemporary dialects have this sound in such suffixes as *nek* [næk] and in some roots.