*The Vowel Inventory of Hungarian: Its Size and Structure**

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This paper suggests a variety of ways in which the number of categories needed for characterizing the surface phonetic vowel inventory of Hungarian (1) can be reduced until eventually a minimal underlying system (5) is reached. Four 'marginal vowels' (parenthesized in (1)) are discussed in particular. [e], [ɛː], and [ɔː] are argued not to be necessary in the underlying system; on the other hand, nonround /ɑ/ turns out to be one of the most loaded Hungarian vowels: one that surfaces as [ɔ] in the regular case, due to an independently motivated rule of the language.

1 Introduction

A surface phonetic classification of the Hungarian vowel system is shown in (1). The system has fourteen 'full members' plus four additional candidates (parenthesized) whose phonological status will be considered in this paper (**2**–**4**). The classification appearing in (1) involves five heights, three points of articulation along the sagittal axis, plus the rounded/unrounded distinction. Obviously, a number of phonetic details can be filtered out of this representation on grounds of predictability. 'Height 1' is conventionally labelled 'High'; the rest of the heights might be called Upper Mid, Lower Mid, Upper Low, and Lower Low, respectively. The difference between Upper Mid and Lower Mid might be taken to be a matter of Tense/Lax; but even that is predictable (redundant) on the basis of Long *vs.* Short (alternatively, VV *vs.* V in terms of timing slots). On the other hand, the two Lows may be simply taken to be the same height phonologically: the exact height of [(a) aː], as well as their centrality, is a matter of phonetic implementation since in the (morpho)phonological pattern of Hungarian [aː] behaves as a low back vowel (*e.g.* with respect to vowel harmony, long/short alternations, *etc.*).

(1) **A surface phonetic classification of Hungarian vowels**

	FRONT		CENTRAL	BACK
	UNROUNDED	ROUNDED	UNROUNDED	ROUNDED
HEIGHT 1	i iː	y yː		u uː
HEIGHT 2	eː	øː		oː
HEIGHT 3	(e)	ø		o
HEIGHT 4	ɛ (ɛː)			ɔ (ɔː)
HEIGHT 5			(a) aː	

Hence, the simplified pattern in (2) emerges; this classification will serve as the general framework within which the phonological status of the four 'marginal vowels' will be discussed in **2–4** below.[1] In **5,** some general conclusions will be drawn and further simplification of the system will be proposed.

(2) **A simplified classification of Hungarian vowels**

	[− back]		[+ back]	
	[− round]	[+ round]	[− round]	[+ round]
[+ high, − low]	i iː	y yː		u uː
[− high, − low]	(e) eː	ø øː		o oː
[− high, + low]	ɛ (ɛː)		(a) aː	ɔ (ɔː)

2 Unrounded short [a]

This vowel appears on the surface (apart from regional dialects) in the following cases (*cf.* Siptár 1991a, Ács & Siptár 1994): (i) In nonfinal closed syllables it is the normal (colloquial) realization of /aː/ as in ***á**ltalános* [altɔlaːnoʃ] 'general', *vás**á**rváros* [vaːʃarvaːroʃ] 'market town'; in certain phonetic contexts (*e.g.* before geminates) with vacillation (where the postlexical shortening rule concerned is optional/rate-dependent): [atːɛkinthɛtøː] ~ [aːtːɛkinthɛtøː] ***á**ttekinthető* 'perspicuous'. (ii) Also with [a] ~ [aː] free variation in words like *sp**á**jz* 'larder', *Sv**á**jc* 'Switzerland', *Moz**a**rt* (here, however, "free variation" means inter-speaker variability rather than intra-speaker vacillation). (iii) On the other hand, [a] ~ [ɔ] (inter-speaker) variation is found in words like *g**a**vott* 'gavotte', *h**a**rdver* '(computer) hardware', *Cs**a**jkovszkij* 'Tchaikovsky', and in *h**a**lló* [haloː] 'hullo' as used in phone calls (where classical minimal pairs can also be found for both [ɔ] and [aː]: *h**a**ló* [ɔ] 'dying' *vs.* *h**a**lló* [a] 'hullo' *vs.* *h**á**ló* [aː] 'net').

The question, then, is what the phonological status of all these [a]'s should be. (From now on, I use the symbol /ɑ/ to refer to the underlying *a*-type — short back low — vowel with no roundness specification intended; the choice of symbol is motivated by considerations of clarity, *i.e.* I wanted a symbol that is distinct from both a and ɔ.) There are a number of convincing arguments to the effect that /ɑ/ behaves morphophonologically as a nonround vowel (*cf.* the length alternation /aː/ ~ /ɑ/ as in *nyá̲r* ~ *nya̲rat* 'summer nom./acc.' and the vowel harmony alternation /ɛ/ ~ /ɑ/ as in *kert-b**e**n* 'in (the) garden' ~ *ház-b**a**n* 'in (the) house'; in both cases an intermediate nonround low back vowel is derived that surfaces via an *a*→[ɔ] realization rule). Since the rounding of /ɑ/ is phonologically irrelevant (nondistinctive) and phonetically rather moderate as opposed to mid and especially high back vowels (though this does not weigh much in phonology), it is at least possible to claim that /ɑ/ is in general (*i.e.* not only in the alternating cases) underlyingly nonround. It was pointed out in **1** above that the centrality of [aː] and the fact that in terms of tongue height it is lower than [ɛ] or [ɔ] are just as redundant phonologically as the surface roundness of [ɔ] is. Hence, the /ɑ/ ~ /aː/ alternation will fit the rest of the pattern where alternants only differ in length (*cf.* **3** on /ɛ/ ~ /eː/).

Now if we accept this reasoning, the following can be said about the three groups of surface [a]'s exemplified above: (i) In addition to the morphophonological rule /aː/→/ɑ/ (*ny**á**r* ~ *ny**a**rat* 'summer nom./acc.'), followed by rounding adjustment /ɑ/→[ɔ], there is also a surface (postlexical) shortening rule that will of course apply (much) later than rounding adjustment and whose output will therefore remain unrounded. (ii) For speakers who say [ʃpajz] *etc.*, underlying nonround /ɑ/ will be a (lexical) exception to rounding adjustment in these words; for other speakers, the lexical representation will be /ʃpaːjz/ to which shortening or rounding adjustment is inapplicable. (iii) The word *halló* and other similar items (the exact range of which varies from speaker to speaker) are exceptional in that they will be (optionally or categorically) exempt from rounding adjustment /ɑ/→[ɔ]. Alternatively, in terms of underspecification theory (*cf.* Archangeli 1988), garden-variety /ɑ/ will be underlyingly unspecified for rounding whereas the vowel in *halló etc.*, as well as *spájz etc.* for [a] speakers, will be specified as [−round]; rounding adjustment would then be a "fill-in rule" in that it cannot *change* feature specifications but only fill in blanks; the desired result then follows without recourse to any exception feature.

In sum: If these considerations are on the right track, nonround /ɑ/ is not marginal: in fact, it is one of the most loaded members of the Hungarian vowel system; what *is* marginal is the range of cases where it surfaces unaltered.

3 Short mid [e]

The case of this vowel is in some respects similar to that of [a], in others it is quite different. On the surface it appears with regional/cultural restrictions (*i.e.* in certain regional varieties). It is contrastively used by many Hungarians, but not by speakers of standard Hungarian in the strict sense. (The postlexical shortening of /eː/ as in the second syllable of *kem**é**nység* 'hardness' results in a vowel tenser than [e], just like that of /oː/ and /øː/; that is, as was pointed out in **1** above, [e] and [eː], [o] and [oː], [ø] and [øː] differ not only in length but also in tenseness.)

If, in standard Budapest Hungarian, [e] does not appear even to the limited extent that [a] does, why do we mention it here? The reason is that Hungarian morphophonology works *as if* there was an /e/ in the system. The nonround member of the alternation *o* ~ *ö* ~ *e* (*ház-h**o**z* 'to (the) house' ~ *föld-h**ö**z* 'to (the) ground' ~ *kert-h**e**z* 'to (the) garden') is mid (at the level of the immediate output of the rule), whereas the front member of the alternation *á* ~ *é* (*ház-n**á**l* 'at (the) house' ~ *kert-n**é**l* 'at (the) garden') and the long member of *e* ~ *é* (*kef**e*** ~ *kef**é**t* 'brush nom./acc.') are low (at the same level), hence an *e*/*é*-adjustment (redundancy) rule is needed to convert such derived *e*'s into a low, and derived *é*'s into a mid (and tense) vowel. (Alternatively, Structure Preservation might produce the same effects without an explicit adjustment rule.) These facts, however, are still not sufficient to justify an underlying /e/, unless the ambiguous behaviour of [ɛ] in vowel harmony could be explained by positing mid /e/ along with low /ɛ/. In particular, Hungarian vowels fall into three harmonic classes as follows: back-harmonic /aː ɑ oː o uː u/, front-harmonic /øː ø yː y/, and neutral /iː i eː/.[2] Surface [ɛ] is ambiguous in that it behaves sometimes as front harmonic and sometimes as neutral (see van der Hulst 1985 for details). It might be a good idea to recognize /e/ as a neutral vowel and /ɛ/ as a front-harmonic one. In fact, all five-vowel solutions implicitly involve this idea. Abondolo (1988 : 29ff.), for instance, has the system in (3):

(3) **Abondolo's five-vowel system**

	I	E	A	O	U
mid	−	+	−	+	−
back	−	−	+	+	+
rounded	−	−	−	+	+

plus a (morpheme-sized) 'front prosody'. *Cf.* also van der Hulst's similar solution couched in autosegmental terms (1985 : 279ff.). Considerations of space prevent us from exploring the full implications of this type of solution; we will rest content with observing that, although certain seemingly irregular classes of words (*e.g.* back-harmonic monosyllabic stems containing a neutral vowel) can be accounted for nicely in terms of such systems, positing two underlying sources for surface [ɛ] raises more problems than it solves. Hence, we will assume that the system has only one nonhigh front unrounded short vowel. For typographical convenience, we will henceforth refer to this item as /e/ — whether it is underlyingly mid (hence, exactly parallel to its long cognate /eː/) or low (hence, identical with its surface representation [ɛ]) will turn out to be irrelevant (see **5** below).

4 Long low [ɔː] and [ɛː]

Along with the surface shortening rule mentioned in the previous sections, there are surface lengthening rules as well (*cf.* Nádasdy & Siptár 1989, Siptár 1991a, Ács & Siptár 1994). "Pause-substituting" (*i.e.* hesitational or phrase-final) and emphatic lengthenings do not convert the short vowels into their long counterparts; rather, they either leave vowel quality unaffected or modify it in another direction (*e.g.* emphatic ***ooo****lyan* 'so much' with an *o* opener than usual, whereas long /oː/ is closer/tenser than /o/). Other types of surface lengthening will produce [iː] out of /i/, [oː] out of /o/, *etc.* For instance, names of letters and sounds are usually quoted in a lengthened version as in *Ezt rövid* [iː]*-vel kell írni* 'This is spelt with short I', *A magyarban nincs rövid* [oː]*-ra végződő szó* 'There are no word-final short O's in Hungarian', *etc.* However, such (surface) lengthening of [ɔ] and [ɛ] will produce [ɔː] and [ɛː], rather than [aː] and [eː]. (This can be explained simply by assuming that such lengthening takes place at a point where the adjustment rules mentioned above have already applied.) For instance, the length of the initial vowels in ***e****rre* [ɛːrɛ] 'this way' and ***a****rra* [ɔːrɔ] 'that way' can be derived by compensatory lengthening although, on a strictly taxonomical view, these should be independent (micro)phonemes, *cf.* the minimal pairs ***e****rre* 'this way'/***e****re* 'his vein': [ɛːrɛ/ɛrɛ] and ***a****rra* 'that way'/***a****ra* 'bride': [ɔːrɔ/ɔrɔ].

The names of the letters/sounds *a* and *e* exhibit a curiously intricate pattern. The basic case can be observed in contexts like *nagy* [ɔː]*-val írjuk* 'it is spelt with capital A', *kétféle* [ɛː]*-vel beszél* 'he distinguishes two types of E in his speech', *etc.* (Minimal pairs can be found again: ***a****-féle* [ɔːfeːlɛ] 'of the type A' *vs.* ***a****ffféle* [ɔfeːlɛ] 'sort of', ***e****-be* [ɛːbɛ] 'into E' *vs.* ***e****be* [ɛbɛ] 'his dog', ***a****-hoz* [ɔːhoz] 'to A' *vs.* ***a****hhoz* [ɔhoz] 'to that', ***e****-szer* [ɛːsɛr] 'E times' *vs. eszer* [ɛsɛr] 'Social-Revolutionary', and so on.) On the other hand, the musical notes ***A*** and ***E*** are called [aː] and [eː], and the word ***á**bécé* [aːbeːt͡seː] 'alphabet' itself makes it likely that the name of the letter A used to be pronounced [aː] (latinate influence?). Letters used for identification exhibit an even more chaotic pattern: the bus *7/**a*** is [heːt ɔː] but a school class *7/**a*** is [heːt aː] (although *7/**e*** is [ɛː] rather than [eː]); ***A*** *épület* 'building A' can be either [ɔː] or [aː] but ***E*** *épület* can only be [ɛː]; in geometry, ***a*** *pont* 'point A' is either [aː] or [ɔː] but ***e*** *pont* is always [ɛː], *etc.* Abbreviations, if they are pronounced as a sequence of letters, contain [aː] and [eː] (or [ɛː] if A or E is initial (***A**B* 'abortion committee', ***E**KG* 'electrocardiogram') but [ɔː] and [ɛː] if final (*MT**A*** 'Hungarian Academy of Sciences', *BS**E*** 'Budapest Sports Club'). Those abbreviations that are read out as words (*US**A*** 'United States', *ELT**E*** 'Eötvös Loránd University') behave as normal words do: they end in short [ɔ]/[ɛ] which regularly undergoes Low Vowel Lengthening ([uʃaːbɔn] 'in the US', [ɛlteːrøl] 'from ELTE'), hence they are uninteresting for our present purposes. What is much more interesting though is that [ɔː] and [ɛː] *never* undergo LVL: [ɛmteːɔːvɔl], not [ɛmteːaːvɔl] if the nominative is [ɛmteːɔː]. (See also the examples listed earlier in this paragraph.)

Now, are [ɔː] and [ɛː] to be regarded as independent (micro)phonemes or as rule-generated realizations of [ɔ]/[ɛ]? Cases like *arra* can be explained by (lexically conditioned) compensatory lengthening, despite the (surface) minimal pairs. But if the name of the letter E is underlyingly a short /e/, how can its surface lengthening block the application of a morphophonological rule like LVL (*cf.* ***e**-nek* [ɛːnɛk] 'for E' ≠ ***é**nek* [eːnɛk] 'song')? Such bleeding interaction undoubtedly runs counter to all current assumptions concerning the way phonological systems are organized. However, the phenomena discussed in this section are both peripheral and variable: therefore, the alternative approach (positing underlying /ɔː/, /ɛː/) will be discarded here and it will be assumed that some exception device takes care of the offending cases.

5 Conclusion

It was argued above that (i) both [ɔ] and [a] go back to underlying /ɑ/ whose roundness need not be specified; (ii) all instances of surface [ɛ] should be derived from a single underlying segment, /e/, whose lowness need not be specified; and (iii) most, if not all, instances of [ɔː] and [ɛː] can be accounted for as due to surface lengthening of [ɔ] (from /ɑ/) and [ɛ] (from /e/), respectively. All these observations add up to an even more simplified underlying vowel system, given in (4).

(4) **A simplified underlying vowel system**

			Back	
High	i	y	–	u
	e	ø	ɑ	o
		Round		Round

Notice that the short∼long opposition is assumed to be encoded in V∼VV on the skeletal tier (a move that would not be possible if the quality differences between [ɔ] and [aː] on the one hand and [ɛ] and [eː] on the other were regarded as underlyingly valid distinctions); notice further that [low] is made superfluous as a classificatory feature (of course, it continues to figure as a phonetic feature that the rules of phonetic implementation need to refer to). Finally, notice that the system in (4) uses the unary features High, Back, and Round rather than the binary features of that in (2); hence, /e/ is neither mid nor low — it is simply nonhigh; /ɑ/ is neither rounded nor unrounded — it is simply not characterized by the feature Round; and finally, neutral vowels are not necessarily defined as front; they simply share the property of not being characterized by the feature Back with the front-harmonic (front rounded) vowels. An alternative possibility (and one more in keeping with most current phonological theories[3]) is recognizing the three unary features (or particles, or elements) A I U for 'aperture', 'palatality', and 'labiality', respectively; this gives us the vowel system shown in (5).

(5) **An alternative simplified underlying vowel system**

	I			
	i	y	u	
A	e	ø	o	ɑ
		U		

Although this version loses some of the advantages (listed above) of that in (4), it is nevertheless superior in one respect: unlike the system in (4), it does not leave any existing vowel of Hungarian completely unspecified (leaving the possibility of empty V for epenthetic vowels that acquire all their properties from the environment) and conversely, it does not define a vowel (*cf.* the high back unrounded slot in (4)) that is nonexistent in Hungarian.

NOTES

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[1] *Cf.* also Nádasdy (1985), Dressler & Siptár (1989, 1992), Siptár (1990, 1991b, 1993), Nádasdy & Siptár (1989, 1994).

[2] Hungarian vowel harmony has been given a lot of attention in the literature. The major contributions include Becker Makkai (1970), Clements (1976), Vago (1976, 1978, 1980a,b), Ringen (1977, 1978, 1980, 1982, 1988), Jensen (1978), Phelps (1978), Zonneveld (1980), Battistella (1982), Booij (1984), Goldsmith (1985), Kontra & Ringen (1986), Farkas & Beddor (1987), Kornai (1990, 1994), Dunn (1992), Olsson (1992, 1993). Various portions of the literature are conveniently summarized in Siptár (1984), van der Hulst (1985), and Nádasdy & Siptár (1994).

[3] *Cf.* van der Hulst (1992) and references cited there.

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