

Connected to this line of research are perception experiments, as suggested by our reviewers, testing the ability of Hungarian speakers to differentiate variably retracted transparent vowels.

6. Conclusion

The experiments reported in this study provide, for the first time, a systematic articulatory description of transparent vowels in a language with vowel harmony. The main result was that the harmonic type of a stem is realized as a sub-phonemic difference in the tongue body position of transparent vowels. Transparent vowels in the front-selecting stems are produced with the tongue body more advanced than the phonemically identical vowels that occur in back-selecting stems. Hence, transparent vowels do participate in vowel harmony at the phonetic level.

A striking property of the data was that even the vowels in isolated monosyllabic stems showed differences in articulation that correlate with their suffix choices. Thus, transparent vowels in monosyllabic stems selecting back suffixes were more retracted than phonemically identical vowels in monosyllabic stems selecting front suffixes. Crucially, these differences emerge from stems elicited in their un-suffixed forms.

Finally, we proposed that a plausible phonetic basis for transparency can be found in characteristics of the relation between articulation and acoustics of transparent vowels. The proposed phonetic basis allows one to relate a previously seemingly unrelated set of observations about the effect of rounding, height, and number of transparent vowels in vowel harmony. The proposed phonetic basis also makes specific predictions about data that can be obtained in future experiments. More broadly, the proposal is that the phonological behavior of transparent vowels can be better understood when the phonological patterning of these vowels is studied together with their articulatory and acoustic characteristics.

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Appendix A

A.1. List of stimuli for subjects ZZ and BU

Back	Gloss	Front	Gloss	Suffix
<i>Trisyllabic words</i>				
/i/				
zafír-ban	sapphire	zefír-ben	zephyr	Iness.
zafír-ból	sapphire	zefír-ből	zephyr	Elat.
zúdit-ott	to hail	szédít-ett	to beguile	3rd Sg. past indef.
tompít-ó	attenuative	tömít-ő	obturating	adj. suff.
normatív-nél	normative	primitív-nál	primitive	Adess.
passzív-hoz	passive	esszív-hez	essive	Allat.
Szólít-od	to address	bővít-ed	to let out	2nd Sg. def.
/i/				
bácsi-ban	uncle	bécsi-ben	of Vienna	Iness.
buli-val	party	bili-vel	pot	Instr.
kocsi-tól	carriage	őcsi-től	buster	Abl.
polip-om	polyp	Filip-em	Filip	1st Sg poss.

szolid-nak	solid	rövid-nek	short	Dat.
bólint-ott	to nod	érint-ett	to touch	3rd Sg. past indef.
Tomi-hoz	Tom.Dim.	Imi-hez	Imre.Dim.	Allat.
Lutri-hoz	lottery	csitri-hez	flapper	Allat.
<i>/ĕ/</i>				
szatén-ban	satin	kretén-ben	cretin	Iness.
tányér-nál	plate	tenyér-nél	palm	Adess.
málé-hoz	spoon	filé-hez	fillet	Allat.
sasszé-val	shuffle	esszé-vel	essay	Instr.
málés-an	stupid	békés-en	peaceful	adj. suff.
ganéz-ott	be composetd	intéz-ett	manage	3rd Sg. past indef.
kadét-tól	cadet	bidé-től	bidet	Abl.

Back

Front

Monosyllabic words

vív	fence	ív	bow
híd	bridge	íz	flavor
ír	write	hír	rumor
víg	cheerful	míg	while
síp	whistle	cím	address
nyit	open	hisz	believe
cél	aim	szél	wind
héj	crust	éj	night

Frame sentence:

Azt mondom, hogy ____ és elismétlem azt, hogy ____ még egyszer. ‘I say ____ and I repeat ____ once again.’

Appendix B*B.1. List of stimuli for subject CK (pilot)*

Trisyllabic & disyllabic words

Back	Gloss	Front	Gloss	Suffix
í				
zafír-ban	sapphire	zefír-ben	zephyr	Iness.
zafír-tól	sapphire	zefír-től	zephyr	Abl.
zafír-hoz	sapphire	zefír-hez	zephyr	Allat.
aktív-ál	Active	beszív-el	to draw	Adj.
naív-ul	Naïve	beív-el	to lob	Adj.
masszív-val	massive	műszív-val	art. heart	Inst.
masszív-hoz	massive	műszív-hez	art. heart	Allat.
masszív-ba	massive	műszív-be	art. heart	Illat.
passzív-val	Passive	kőszív-val	heart of adamant	Inst.
passzív-hoz	Passive	kőszív-hez	heart of adamant	Allat.
zúdít-ott	to hail	szédít-ett	to beguile	3rd Sg. past i ind.
jobbít-om	to ammend	kisebbít-em	to lessen	1st Sg. poss.
kábít-om	to daze	repít-em	to send	1st Sg. poss.
i				
náci-val	Nazi	nőci-vel	bimbo	Inst.
náci-ban	Nazi	nőci-ben	bimbo	Iness.

náci-hoz	Nazi	nőci-hez	bimbo	Allat.
bácsi-val	Uncle	bécsi-vel	of Vienna	Inst.
bácsi-ban	Uncle	bécsi-ben	of Vienna	Iness.
bácsi-hoz	Uncle	bécsi-hez	of Vienna	Allat.
buli-val	Party	telivér	full-blood(ed)	Inst.
buli-ban	Party	belibeg	to breaze in	Iness.
cumi-ban	Title	semmibe	to ignore	Iness.
kocsi-tól	Coach	kicsi-től	small	Abl.
lutri-val	Lottery	csitri-vel	flapper	Inst.
lutri-hoz	Lottery	csitri-hez	flapper	Allat.
lutri-ba	Lottery	csitri-be	flapper	Illat.
mázli-val	Fluke	müzli-vel	muesli	Inst.
nyuszi-tól	Bunny	tenyészdő	breeding season	Nominal
polip-on	Polyp	zsilip-en	sluice	Superess.
polip-om	Polyp	Fillip-em	name	1st Sg poss.
cucitám	pacifier	filiszter	philistine	Root
kap-ni	to get	köp-ni	to gob	Inf.
lop-ni	to pinch	löp-ni	to step	Inf.
é				
acél-nak	Steel	beszél-nek	to address	Dat.
affér-ban	Affair	térbeli	spatial	Iness.
bode-tól	Hut	bidet-től	bidet	Abl.
kávê-val	Coffee	végê-vel	end	Inst.
soltész-ból	Name	tengerész-ből	mariner	Elat.
tányér-hoz	Plate	tenyér-hez	palm	Allat.
málê-val	Spoon	felê-vi	terminal	Inst.
málê-hoz	Spoon	lêhû-tő	loafer	Allat.
sasszé-val	shuffle	esszé-vel	essay	Inst.
sasszé-ból	shuffle	esszé-ből	essay	Elat.
sasszé-hoz	shuffle	Esszé-hez	essay	Alat.
csálê-val	crooked	meggylé-vel	sour cherry juice	Inst.
csálê-ban	crooked	meggylé-ben	sour cherry juice	Iness.
csálê-hoz	crooked	meggylé-hez	sour cherry juice	Allat.
vám-ért	Duty	fém-ért	metal	Caus.
hám-ért	harness	hím-ért	dog	Caus.
púp-ért	Hump	pép-ért	cream of wheat	Caus.
e				
totem-mal	Totem	tetem-mel	dead body	Inst.
totem-tól	Totem	tetem-től	dead body	Abl.
hárem-ban	Harem	érem-ben	medal	Iness.
hárem-mal	Harem	érem-mel	medal	Inst.
hárem-on	Harem	érem-en	medal	Superess.
hárem-ba	Harem	érem-be	medal	Illat.
hárem-ból	Harem	érem-ből	medal	Elat.
hárem-hoz	Harem	érem-hez	medal	Allat.

Frame sentences

Azt mondom, hogy ____ és elismétlem azt, hogy ____ még egyszer.

‘I say ____ and I repeat ____ once again.’

Ekkor azt láttam, hogy ____ akkor pedig azt láttam, hogy ____ még egyszer.

‘Now I see ____ and then I read ____ once again.’