

Vowel Harmony and Related Phenomena in Inari Saami

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Earlier Works

- Äimä 1918: IS phonetics and phonology
- Itkonen 1939, 1971, etc.: Historical and recent development, metaphony
- Korhonen 1981 (etc.): Historical development
- Sammallahhti 1984, 1998 etc.: Historical and recent development, metaphony
- Morottaja 2016: Harmony, vowel families and types (*vookaalperruuh já -tiijpah; vokaaliperheet ja -tyypit*)
- Ibid.; Morottaja & Olthuis (2022): vowel families and types, morpho-phonological classification of words based on first-syllable vowel



Note on Transcription

IPA	FUT	Itkonen (e.g. 1971, 1992)	Valtonen et al. (2022)	Morottaja & Olthuis (2022)	Current standard	Koukkari
ə, ʏ, ɵ, ɜ, ɐ	ɛ, ξ, ξ, ɐ, ǎ	æ ¹ , a ²	ə	ə, â (ə)	e ¹ , â ²	ə
e	e	e	e	e	e	e
ɑ	a	a	ɑ	a	a	ɑ
a, æ	à, ä	à, ä	æ	á, ä	á, ä	ɑ > æ

- In this presentation:

- Example words in (standard) orthography.
- Phonemic transcriptions in the same IPA-based system as used by Valtonen, Aikio & Ylikoski in the Oxford Guide to the Uralic Languages.
- Historical reconstructions in the established FUT.

- 1) First syllable
- 2) Non-initial syllables



Vowel Phonemes

Monophthongs

i	(y)	u
e, (ø)	ə	o
æ		ɑ

Diphthongs

ie	ye	uo
iæ	uæ	

- Rounded front vowels only occur as independent phonemes in loanwords.
- Status of ə is complicated.
- Vowel length:
 - Usually considered phonemic; 2-3 degrees for monophthongs, 2 for diphthongs.
 - Standard orthography indicates long monophthongs with double letter (<aa> = /ɑ:/); length otherwise not shown.
 - Length in 1st syllable varies independently of quality, and can thus be ignored in this presentation (mainly short vowels used, but same rules for long ones).

Historical Development: PS Situation

Proto-Saamic vowels

Short

*i		*u
	*e	*o

Long

*ē	*ō
*ē̄	*ō̄
*ā	

Contracted

*î	*û
*ê	*ô
*â	

- Mainly bisyllabic word roots
- All non-contracted vowels may occur as 1st-syllable vowel (V₁).
- Contracted vowels only occur as V₂.
- The only non-contracted vowels occurring freely as V₂ are *e, *ē, *ō̄.
 - *o, *u, *ē̄, *ō not found in this position.
 - *i, *ā as V₂ (almost) exclusively in suffixed forms.

Historical Development: Main Rules

- V_2 quality largely retained.
 - Non-contr. $*\bar{y}, *\bar{e} > u, i$ usually after long V_1 .

$V_1 \backslash V_2$	$*\text{e}$	$*i$	$*\hat{i}$	$*\hat{u}$	$*\bar{a}$	$*\hat{a}$	$*\bar{y}$	$*\hat{y}$	$*\bar{e}$		$*\hat{e}$
$*\text{e}$	$o-\text{ə}$	$o-i$		$o-u$	$a-a$		$a-o$		$a-e$		
$*\underset{\sim}{o}$	$u-\text{ə}$	$u-i$		$u-u$	$o-\text{æ}$		$o-o$		$o-e$		
$*u$					$u-\text{æ}$		$u-o$		$u-e$		
$*i$	$i-\text{ə}$	$i-i$		$i-u$	$i-\text{æ}$		$i-o$		$i-e$		
$*\bar{a}$	$a-\text{ə}$	$a-i$		$a-u$	$a-a$		$\text{æ}-u$	$\text{æ}-o$	$\text{æ}-i$		$\text{æ}-e$
$*\bar{y}$	$o-\text{ə}$	$o-i$		$o-u$	$u\text{æ}-\text{æ}$		$u\text{æ}-u$	$u\text{æ}-o$	$u\text{æ}-i$		$u\text{æ}-e$
$*\bar{o}$	$uo-\text{ə}$	$uo-i$		$uo-u$					$ye-i$	$ye-e$	
$*\bar{\text{e}}$	$\text{ə}-\text{ə}$	$e-i$		$\text{ə}-u$	$i\text{æ}-\text{æ}$		$i\text{æ}-u$	$i\text{æ}-o$	$e-i$	$e-e$	
$*\bar{e}$	$ie-\text{ə}$	$ie-i$		$ie-u$					$ie-i$	$ie-e$	

- IS V_1 depends on V_2 ; some combinations rare or impossible.



Historical Development: Exceptions in V_2

- $*e > /a/$ before final $/h/$: *kielâ* 'tongue, language', NOM.PL *kielah*.
- Changes before $/j/$:
 - $*e > /æ/$ (in originally trisyllabic forms): *kielâ*, SG.COM *kieläin*
 - $*ō > /o/$ (as above): *ákku* 'grandmother' SG.COM *áhhoin*
 - $*î > /e/$ (in uncontracted forms of contr. verbs): *finniđ* 'get', PST.1SG *finnejim*
- Split of $*ē$ after historically long V_1 :
 - $*ē > /e/$ when preceded by a short consonant and V_1 of the group $/e\ ie\ ye/$:
eellid̥ 'live', IMP.2SG *ee*
 - $*ē > /i/$ otherwise.
 - Dialectal variation: $*ē > /e/$ may occur more broadly than specified above, and there may be a similar split of $*ō$ into $/o/$ and $/u/$.



Current Situation: V_1-V_2

- Typical
- Limited
- Very limited (individual forms, recent loans)
- Marginal or non-existent

	a	o	u	i	æ	e	ə
a	a—a	a—o	a—u	a—i	a—æ	a—e	a—ə
o	o—a	o—o	o—u	o—i	o—æ	o—e	o—ə
u	u—a	u—o	u—u	u—i	u—æ	u—e	u—ə
i	i—a	i—o	i—u	i—i	i—æ	i—e	i—ə
æ	-	æ—o	æ—u	æ—i	æ—æ	æ—e	-
e	e—a	e—o	e—u	e—i	e—æ	e—e	-
ə	ə—a	-	ə—u	-	ə—æ	ə—e	ə—ə
iæ	-	iæ—o	iæ—u	-	iæ—æ	-	-
uæ	-	uæ—o	uæ—u	uæ—i	uæ—æ	uæ—e	-
uo	uo—a	uo—o	uo—u	uo—i	uo—æ	?	uo—ə
ie	ie—a	?	ie—u	ie—i	ie—æ	ie—e	ie—ə
ye	-	-	-	ye—i	-	ye—e	-



Current Situation: V_1 – V_2

- Typical
- Limited
- Very limited (individual forms, recent loans)
- Marginal or non-existent

	a	o	u	i	æ	e	ə
a	asta	asto	rahtuđ	rahtim	palláim	alme	hattâ
o	joolah	osko	oskum	ostim	kován	kove	jollâ
u	tuulah	puško	muttuđ	muttiđ	sukká	muštedđ	tullâ
i	čiinjah	kirkko	pivdum	finniđ	pirrá	ihe	čijnâ
æ	-	áhheid	ákku	rähtiđ	lášká	käskee	-
e	telтта	leijoon	hersku	enni	kehá	pele	-
ə	eedah	-	ennuv	-	hææjaid	tælle	ettâ
iæ	-	siäloid	siälu	-	hiärrá	-	-
uæ	-	vuároid	vuáru	kuáti	puátá	puáttee	-
uo	čuolmah	kuoro	puohtuđ	puohtim	čuolmáid	?	čuolmâ
ie	kiedah	?	tiettuđ	tiettiđ	kiedáid	tiede	kietâ
ye	-	-	-	kyeli	-	kyele	-



/ɑ/ vs. /æ/: Harmony

	ɑ	o	u	i	æ	e	ə
ɑ	ɑ-ɑ	ɑ-o	ɑ-u	ɑ-i	ɑ-æ	ɑ-e	ɑ-ə
æ	-	æ-o	æ-u	æ-i	æ-æ	æ-e	-

- Cannot normally co-occur in a (non-compound) word.
 - With other vowels partially complementary.
- V_1 /ɑ/ causes V_2 /ɑ/ instead of /æ/:
ihe 'year', SG.ILL *ihán*; *kove* 'picture', SG.ILL *kován*;
ahe 'age' SG.ILL *ahan*
- Some forms feature regressive metaphony instead of progressive harmony:
aassâđ /ɑ:ssəð/ 'live, dwell', PRS.3SG *áásá* /æ:sæ/

	ɑ	æ
ɑ	ɑ-ɑ	ɑ-æ
o	o-ɑ	o-æ
u	u-ɑ	u-æ
i	i-ɑ	i-æ
æ	-	æ-æ
e	e-ɑ	e-æ
ə	ə-ɑ	ə-æ
iæ	-	iæ-æ
uæ	-	uæ-æ
uo	uo-ɑ	uo-æ
ie	ie-ɑ	ie-æ
ye	-	-



/ɑ/ vs. /æ/: Disharmony

- Disharmonic sequences may occur when the first-syllable vowel is /ɑ/:
 - Before /j/: *aassâđ*, PST.3DU *aasáin* /ɑ:sæjn/
 - In polysyllabic forms: VABE *asâhánnáá* /ɑsəhænnæ:/
 - With long /æ:/: *taat* /tɑ:t/ 'this', SG.ABE *taanttáá* /tɑ:nttæ:/
- No disharmonic words with first-syllable /æ/ (?).
 - No suitable development from Proto-Saamic
 - Finnish also has vowel harmony, while /æ/ is rare in Scandinavian languages > no loanwords with the combination /æ–ɑ/



The Status of /ə/

	ɑ	o	u	i	æ	e	ə
ɑ	ɑ-ɑ	ɑ-o	ɑ-u	ɑ-i	ɑ-æ	ɑ-e	ɑ-ə
e	e-ɑ	e-o	e-u	e-i	e-æ	e-e	-
ə	ə-ɑ	-	ə-u	-	ə-æ	ə-e	ə-ə

- Almost compl. dist. with /e/ as V_1 ; some variation before /u/ and in monosyllables.
- Contrast with /ɑ/: same contexts as above, plus pairs /ɑ-ɑ ɑ-ə ə-ə/.
 - As V_2 after other V_1 's: /ɑ/ before /h/, /ə/ otherwise.
- Considered phonemic in this presentation.
 - Minimal triad: *vardâm* *vardem* *vardam*
'figure.PX1SG' 'bleeding' 'bleed.PTCP.PST'

	ɑ	e	ə
ɑ	ɑ-ɑ	ɑ-e	ɑ-ə
o	o-ɑ	o-e	o-ə
u	u-ɑ	u-e	u-ə
i	i-ɑ	i-e	i-ə
æ	-	æ-e	-
e	e-ɑ	e-e	-
ə	ə-ɑ	ə-e	ə-ə
iæ	-	-	-
uæ	-	uæ-e	-
uo	uo-ɑ	?	uo-ə
ie	ie-ɑ	ie-e	ie-ə
ye	-	ye-e	-



/ə/ vs. /e/: Distribution

	a	o	u	i	æ	e	ə
e	e-a	e-o	e-u	e-i	e-æ	e-e	-
ə	ə-a	-	ə-u	-	ə-æ	ə-e	ə-ə

- Cannot normally co-occur in a (non-compound) word.
- As V_1 : /e/ before /i/ and (less commonly) /e/, otherwise /ə/.

enni /enni/ 'mother', *ele* /ele/ 'live.IMP.2SG'

ettâ /əttə/ 'thing', *ennuv* /ənnuv/ 'much'

– No minimal pairs.

- As V_2 : contrast after /a o u i/, otherwise mostly complementary.

	e	ə
a	a-e	a-ə
o	o-e	o-ə
u	u-e	u-ə
i	i-e	i-ə
æ	æ-e	-
e	e-e	-
ə	ə-e	ə-ə
iæ	-	-
uæ	uæ-e	-
uo	?	uo-ə
ie	ie-e	ie-ə
ye	ye-e	-



/ə/ vs. /e/: Metaphony

- Regressive metaphony only; no systematic alternation in non-initial syllables (cf. /ɑ/ vs. /æ/).
- Typical case: V_2 alternation /ə/ ~ /i/ ~ /æ/ causes, respectively, V_1 /ə/ ~ /e/ ~ /iæ/:

ettâđ /əttəð/ 'say'

PST.1SG *ettim* /ettim/

PRS.3SG *iätá* /iætæ/

- V_1 /e/ also before /e/: PRS.3SG *eteh* /eteh/



/ə/ vs. /e/: Exceptions

- Lexical & idiolectal variation before /u/ and in monosyllables:
meendu /mə:ndu/ ~ /me:ndu/ 'excessively, too'; *lâš* ~ *leš* 'be.POT.3SG'
 - Some dialects (and idiolects?) always use /e/.
- V_2 /ə/ > /æ/ before /j/ does not appear to cause V_1 /ə/ > /iæ/:
ettâđ, PST.3DU *eedáin* /ə:ðæjn/ (Itkonen 1986: *ēδàin*)
- Polysyllabic forms: *aassâđ*, PRS.2PL *asâvetted*
árvuštâllâđ 'evaluate', PST.1SG *árvuštâllim* ~ *árvuštellim*
- The disharmonic V_1 – V_2 sequence /ə–e/ occasionally found in colloquial speech (Itkonen 1992): *tælle* /tølle/ 'then' (standard *talle*)
mæhte /møhte/ 'how' (*maht*, *mahte*)
 - Recorded in 1952.
 - Apparently only in certain high-frequency words; prosodically unstressed?



Rounded Vowels: Front vs. Back

- /ø y/ as independent phonemes only in recent loanwords.
 - [ʏ] (~ [y]) historically an allophone of /u/ after certain consonants and in the diphthong *ye* [ʏə ~ ye] (could be analyzed as /ue/ or /uə/).
- /y/ imported in some loans as demanded by Finnish harmony, but remains marginal: *kännyk* 'cellphone' (< Fi coll. *kännykkä*)
pövkkyr 'coarse fur coat' (< Fi dial. *pöykkyri*)
pygálys ~ *pygálus* 'reindeer roundup' (< Fi dial. *pykálys*)
- /ø/ extremely rare.
 - Olthuis (2017) finds six words, the most common being *ministeriö*.
 - /ø/ is V₁ in the other five; /ø/ in a non-initial syllable in only one word.



V₁ Groups

- Typical
- Limited
- Very limited (individual forms, recent loans)
- Marginal or non-existent

	ɑ	o	u	i	æ	e	ə
ɑ	ɑ—ɑ	ɑ—o	ɑ—u	ɑ—i	ɑ—æ	ɑ—e	ɑ—ə
o	o—ɑ	o—o	o—u	o—i	o—æ	o—e	o—ə
u	u—ɑ	u—o	u—u	u—i	u—æ	u—e	u—ə
i	i—ɑ	i—o	i—u	i—i	i—æ	i—e	i—ə
æ	-	æ—o	æ—u	æ—i	æ—æ	æ—e	-
e	e—ɑ	e—o	e—u	e—i	e—æ	e—e	-
ə	ə—ɑ	-	ə—u	-	ə—æ	ə—e	ə—ə
iæ	-	iæ—o	iæ—u	-	iæ—æ	-	-
uæ	-	uæ—o	uæ—u	uæ—i	uæ—æ	uæ—e	-
uo	uo—ɑ	uo—o	uo—u	uo—i	uo—æ	?	uo—ə
ie	ie—ɑ	?	ie—u	ie—i	ie—æ	ie—e	ie—ə
ye	-	-	-	ye—i	-	ye—e	-



V₁ Groups

- /a o u i/ as V₁ combine (relatively) freely with any V₂.
- Limited where other V₁'s occur freely (V₂ /u i/).
- /æ e ə/ and diphthongs solely from historically long vowels.

	a	o	u	i	æ	e	ə
a	a-a	a-o	a-u	a-i	a-æ	a-e	a-ə
o	o-a	o-o	o-u	o-i	o-æ	o-e	o-ə
u	u-a	u-o	u-u	u-i	u-æ	u-e	u-ə
i	i-a	i-o	i-u	i-i	i-æ	i-e	i-ə
æ	-	æ-o	æ-u	æ-i	æ-æ	æ-e	-
e	e-a	e-o	e-u	e-i	e-æ	e-e	-
ə	ə-a	-	ə-u	-	ə-æ	ə-e	ə-ə
iæ	-	iæ-o	iæ-u	-	iæ-æ	-	-
uæ	-	uæ-o	uæ-u	uæ-i	uæ-æ	uæ-e	-
uo	uo-a	uo-o	uo-u	uo-i	uo-æ	?	uo-ə
ie	ie-a	?	ie-u	ie-i	ie-æ	ie-e	ie-ə
ye	-	-	-	ye-i	-	ye-e	-



V₁ Groups

- V₂ /e o/ rarely occur if V₁ is /æ e ə/ or a diphthong; usually changed to /i u/.
 - V₂ alternation /e/~i/ or /o~/u/ (dependent on V₁) in some forms.
 - Certain extra complications for V₁ /e ie ye/ before V₂ /e i/ (cf. split of historic *ē).
- V₁ /ɑ o u i/ before V₂ /u i/ indicates contraction or loan, and thus a different inflectional pattern.
 - Same restriction for /uo/ and (before /u/ only) /ə ie/.



V₁ Groups

- Possible grouping:
 - Two main groups, /ɑ o u i/ vs. /æ e iæ uæ ie/.
 - The latter has two subgroups: /æ iæ uæ/ (æ group) vs. /e ie/ (e group).
 - /ə uo ye/ rarely occur in the relevant environments; /ə uo/ roughly pattern with /ɑ o u i/, while /ye/ patterns with /æ e iæ uæ ie/.
- Terminology:
 - Provisionally "back" vs. "front", but this requires /i/ to be "back".
 - Dark vs. bright (cf. Fischer-Jørgensen 1967)?
 - Sometimes used to describe the low back vs. front vowel in IS & NS.
 - Roughly analogous to back vs. front; may also have the same problem, in that /i/ should be dark, but is often considered the "brightest" vowel (ibid.).



V₁ Groups

	Dark	Bright	le iel
PRS.3PL of â-stem verbs	-eh <i>nuurrâđ : nore<u>h</u></i>	-ih <i>aassâđ : ääs<u>i</u>h</i>	either (?) <i>ettâđ : ete<u>h</u></i> <i>keččâđ : kečč<u>i</u>h</i>
1 st and 3 rd person imperative	-o- <i>nuurrâđ : nor<u>o</u>s</i>	-u- <i>aassâđ : áás<u>u</u>s</i>	
Metaphonic alternation in i-stem nouns	no <i>p<u>i</u>lli : pi<u>i</u>lin : pi<u>i</u>lij</i>	yes <i>ky<u>e</u>ssi : ku<u>á</u>sán : ku<u>o</u>sij</i>	
Latus alternation in u-stem nouns	no <i>tavlu : tavlu<u>i</u>n</i>	yes <i>ákku : áhhu<u>i</u>n</i>	
Verbs ending in -idđ, -udđ	contracted <i>čurgidđ : čorgee</i>	non-contracted <i>puáttidđ : puátá</i>	either <i>hettidđ : hettee</i> <i>pettidđ : piättá</i>
V ₁ before grade II in á-stem nouns and â-stem verbs	short <i>pirrá : pi<u>r</u>á nuurrâđ : no<u>r</u>á</i>	long <i>lášká : lá<u>á</u>šká aassâđ : á<u>á</u>sá</i>	

nuurrâđ 'collect' *tavlu* 'framed picture' *hettidđ* 'obstruct'
keččâđ 'look' *čurgidđ* 'clean' *pettidđ* 'deceive'
pilli 'drinking straw' *puáttidđ* 'come' *pirrá* 'spinning top'
kyessi 'guest' *lášká* 'slacker, slob'



Current Developments: Instability?

- /ɑ/ vs. /æ/: Both can be reduced to /ə/.
väldiđ 'take', PTCP.PST *váldám* ~ *váldâm*
vardedđ 'bleed', *vardam* ~ *vardâm*
 - Mainly as V₂ (although cf. previous note on /ə–e/)
 - Conversely, some speakers use /ɑ/ instead of /ə/ (Itkonen 1971).
- V₁ /ə/ merging with /e/?
 - Itkonen 1971:
"nykyisin alkaa yleistyä [...] tietyissä sanatyypeissä [...] esim. pes'tu·m voi murteittain ääntyä myös peštum"
 - Mettovaara (forthc.)



Current Developments: Instability?

- New vowel combinations increasingly appearing in loans.
 - Widespread bilingualism, Finnish often being dominant > IS increasingly affected by the phonological structure of Finnish, while loans from the latter face decreasing pressure to conform to IS?
- Increased literacy in IS, written form plays important role in how many new speakers learn the language.
 - Olthuis 2009:

”Lâi máttátmist väädis finniđ párnáid luuhâđ *škovlâ* togobeht, kost čallui puáris čäällimvyevi mielđ *škovla*.”
 - Modern orthography distinguishes /ə/ from /ɑ/ in non-initial syllables, but not from /e/ as V₁; effects?



Conclusions

- /ɑ/ vs. /æ/: Both progressive and regressive metaphony.
 - Progressive harmony quite limited.
- /ə/ vs. /e/: No true progressive harmony; three-way regressive metaphony between /ə/ ~ /e/ ~ /iæ/.
- /u/ vs. /y/: Marginal, only as imported from Finnish.
- First-syllable vowels may be divided into two broader groups ("dark" and "bright") based on certain morphophonological features of the word that can be inferred from them.
 - Wide range of effects, only partially related to vowel quality.
- System based on a delicate balance of historical developments and maintenance of distinctions; might be lost of certain trends obscuring these distinctions continue.



Takkâ!

<https://github.com/tkoukkar/anaraskiela/>