Icelandic Umlaut as Morpheme-Specific Phonology

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Outline

The Icelandic ʏ-umlaut and its triggering environments:

- An analysis based on phonological conditioning is not tenable
- The umlaut pattern surfaces if and only if specific trigger morphemes are present in the input
- Morpheme-Specific Phonology (Pater 2009)
- Implications for locality

Core data

(1) a→œ/_C$_0$ʏ

/a/ ∼ /œ/ alternation:

(2) *barir* 'bars.NOM.PL.': /bar+ɪr/ → [barɪr]

(3) *börum* 'bars.DAT.PL.': /bar+ʏm/ → [bœrʏm]

In context:

(4) Hvar eru bar-ir í Amherst?
where are bars-Nom.Pl in Amherst?
'Where are bars in Amherst?'

(5) Málfræðingar hanga oft á bör-um.
linguists hang out often at bars-Dat.Pl.
'Linguists often hang out at bars.'

Goals

Empirical:

- Show that the Modern Icelandic Umlaut is not a purely phonological generalization
- It is a phonological effect that is sensitive to the identity of specific trigger morphemes

Theoretical:

- Identify theoretical tools that are appropriate for the analysis (indexed constraints, floating features)
- Identify theoretical tools that are not appropriate for the analysis (ʏ-deletion, ʏ-epenthesis, sensitivity to derived environments)

More broadly:

- The result is not bad for phonology. Exceptionality is important and the Umlaut can yield insights in that context.

Background

Background

- The ʏ-umlaut is the modern reflex of the Old Icelandic u-umlaut. In the general case, /a/ surfaces as /œ/ whenever /ʏ/ occurs in the following syllable (6), as in (7).

(6) a→œ/_C$_0$ʏ.

(7) /bar+ʏm/ → [bœrʏm] 'bars.DAT.PL.'

- A phonological effect of type (7) is robustly productive and uniform.
- Problematically, the generalization *aCʏ is not surface true and the /a/ ∼ /œ/ alternation is equally productive with silent trigger morphemes as ʏ-morphemes.

Productivity

- It is ungrammatical to fail to apply the Umlaut with nonce words as well as loanwords:

(8) Nonce word
/nar+ʏm/ → [nœːrʏm̥], *[naːrʏm̥] nonce noun, DAT.PL.

(9) Loanword
/aipat+ʏm/ → [aiːpœtʏm̥], *[aiːpatʏm̥] iPad, DAT.PL.

- The requirement is equally robust with zero triggers:

(10) Nonce word with a zero trigger
/nar-$\emptyset_{nom.pl.}$/ → [nœr̥], *[nar̥] nonce noun, NEUT.NOM.PL.

(11) Loanword with a zero trigger
/ahp-$\emptyset_{nom.pl.}$/ → [œhp], *[ahp] 'app (e.g. smartphone app)-NEUT.NOM.PL.'

Not just morphology

- While sensitive to morphemes, the effect on the root is not a morphological operation, but rather something that operates at a phonological level
- In anticausatives, the -*n*- morpheme can intervene between the root and the trigger and this does not prevent the umlaut effect.

(12) bat-**n**-aði 'improved-**n**-3rd.pers.**sg**.past.'

(13) böt-**n**-uðu 'improved-**n**-3rd.pers.**pl**.past.'

(see Jim Wood forthcoming)

- The -*n*- morpheme otherwise robustly prevents following material from conditioning allomorphy on the root, presumably since such operations require phonological adjacency (see Embick 2010).

Solutions to 'productive phonology with exceptions'

Phonology:

- Maintain the umlaut rule as a phonological generalization.
- Propose additional rules or constraints, modified underlying structures, and/or crucial assumptions about the architecture of the grammar.
- Runs into empirical problems (below).

Morpho-(identity)-phonology:

- Admit a 'morphophonological phenomenon of some sort' where the identity of morphemes plays a role.
- Formal proposals of this sort are lacking for the Icelandic Umlaut

Phonology

a→œ/_C_0Y

(without reference to morpheme-identity)

Theoretical tools

All analyses within Approach P use some combination of the following theoretical tools:

- Final ʏ-deletion
- ʏ-epenthesis
- Dependence on derived environments

(for example Valfells 1967; Anderson 1969a,b; Orešnik 1977; Rögnvaldsson 1981; Kiparsky 1985; Gibson and Ringen 2000; Jurgec 2011)

Final ʏ-deletion

Final ʏ-deletion has been used to avoid reference to silent triggers (e.g. neuter nominative plural), reconstructing the following development from Proto-Norse (the historical picture is simplified here for clarity).

(14) UR (Proto-Norse) /barn-u/ 'children.NOM.PL.'
Umlaut: /bœrn-u/
Final-u deletion: /bœrn-∅/ (Mod.Ice. /pœtn̥/)

Numerous ʏ-final words provide counterexamples:

(15) *stelpu* 'girl.ACC/DAT/GEN'

- These never delete.
- The final ʏ that deletes could be a different ʏ, e.g. by underspecification, but then it apparently never surfaces in the only environment in which it appears.

ʏ-epenthesis

ʏ-epenthesis is assumed by several analyses, reconstructing an Old Icelandic sound change, counterfeedingly deriving the lack of umlaut in modern *dagur* /taɣ-ʏr/ 'day-NOM.SG.':

(16) UR (Old Icelandic): /taɣ-r/ 'day-NOM.SG.'
Umlaut: /taɣ-r/
Epenthesis: /taɣ-ʏr/

- There is limited reason for a modern child to assume an underlying /-r/ nominative singular and an epenthesis rule, rather than underlying /-ʏr/
- Some independent support was argued for in (Orešnik 1972) but withdrawn in (Orešnik 1978): "There is no Epenthesis Rule in Modern Icelandic Grammar".

Epenthesis issues

- Problematically the epenthesis generalization is also not surface true (since the 17th century at least).

(17) *flögr*, [flœːɣr̥] 'flying-NEUT.NOM.SG.' (deverbal)

(18) *flögur* [flœːɣʏr̥] 'chips, snacks-FEM.NOM.PL.'

- No /ʏ/ is inserted in (17).
- The /-r/ ∼ /-ʏr/ distinction is contrastive.
- The synchronic motivation for ʏ-epenthesis is limited and it requires even further stipulations to explain (17) vs. (18).

Derived environments

Derived environments are invoked in some analyses (e.g. Rögnvaldsson 1981, Kiparsky 1985)

- Morpheme-associated properties matter, but not the identity of individual morphemes
- This explains why the umlaut is not triggered in cases like (19) where there is no morpheme boundary

(19) *kaktus*, [k^{h}axtʏs] 'cactus', *Bakkus*, [pahkʏs] 'Bacchus'

Concerns with derived environments

- Cuteness nicknames of type (20) are derived and do not undergo the umlaut

(20) *Hrafn-us*, [r̥apnʏs], from *Hrafn*, *Add-us* [atːʏs], from *Addi*, *Sar-us* [saːrʏs] from *Sara*

- Most obviously, this is not one of the morphemes that are learned as triggers.

No epenthesis before /-s/

- We can consider whether this /ʏ/ is epenthetic

(21) *Hrafn-us*, [r̥apnʏs], from *Hrafn*
Add-us [atːʏs], from *Addi*
Sar-us [saːrʏs] from *Sara*[1]

- /-ʏs/ ∼ /-s/ is contrastive, so /ʏ/ here is not epenthetic.

(22) *Hrafns* 'Hrafn-MASC.GEN.SG.' (proper name)
adds 'the act of adding someone on a social network-NEUT.GEN.SG.'
SARS 'Severe acute respiratory syndrome--NEUT.NOM.SG.' (as loanword)

[1] Note that the umlaut effect is independent of vowel lenght.

Amplified concerns

- The empirical concerns surrounding dependence on **epenthesis** and **derived environments** are amplified by the fact that these analyses also require **morpheme-specific triggering** and **floating features** or some equivalent alternative when the modern trigger is silent.
- Historical deletion:

(23) UR (Proto-Norse) /barn-u/ 'children.NOM.PL.'
Umlaut: /bœrn-u/
Final-u deletion: /bœrn-∅/ (Mod.Ice. /pœtn̥/)

- **Morpheme-specific triggering** and **floating features** in some form are necessary and sufficient to account for the core pattern, and we do not need historical phonology, such as the epenthesis rule, to be part of the modern linguistic competence.

Morpheme-Specific Phonology
Pater (2009)

Individual morphemes matter for the Umlaut
(Árnason 2005; Markússon 2012; Þorgeirsson 2012),

Constraints I

- We can use the Gibson & Ringen (2000) analysis as a starting point and adapt it to the current assumptions.

(24) UMLAUT (COINCIDE$_{color}$)
A strong color node ([-back,+round]) of an affix must coincide with a root vowel. (x coincides with y if x dominates y or y dominates x) (Domain-Prosodic Word).
Violations: If the strong color node does not coincide with a root vowel, one violation is assessed for every vowel that intervenes between the left edge of the strong color node and the left edge of the root.

- As for the precise formulation of the UMLAUT constraint, this is not a talk on types of feature assimilation theories (see Jurgec 2011 for recent discussion which considers the Umlaut).

Constraints II

(25) IDENT-IO
Correspondent input and output segments have identical specifications for all features. One violation is assessed for each feature that differs.

Gibson & Ringen (2000) furthermore adopt a unidirectional faithfulness constraint, following Pater (1999). This constraint is undominated and prevents unrounding from satisfying the harmony constraint.

(26) ID-I→O[ROUND]
If an input segment is specified as ROUND, then its correspondent output segment must have identical specifications for all features.

Toy lexicon

(27) Unindexed morphemes:[2]
/-YR-MASC.NOM.SG/
/-YS-NICKNAME/
/√taɣ/ 'day'
/√par/ 'bar'
/√patn/ 'child'
/√r̥apn/ 'Hrafn (prop. name)'
/√salat/ 'salad'

(28) Indexed morphemes:
/-YM-DAT.PL$_L$/
/-YN-NOMLZ$_L$/

(29) Indexed morphemes with a floating [-back,+round]
/-∅-NEUT.NOM.PL.-[-back,+round]$_L$/
/-∅-FEM.NOM.SG.-[-back,+round]$_L$/

[2] I use the root symbol to indicate which morphemes are roots. Suffixes are preceded by a dash for clarity.

Triggering

(30) Basic umlaut effect, *dögum* 'days-DAT.PL.' (indexed dative plural morpheme)

/taɣ-ʏm-DAT.PL$_L$/	ID-I→O[ROUND]	UMLAUT-L	ID-IO	UMLAUT
a. taːɣʏm̥		*!		*
b. ☞ tœːɣʏm̥			**	
c. taːɣɪm̥	*!		*	

(31) Floating feature, *börn* 'children-NEUT.NOM.PL.'

/patn-∅-[-back,+round]$_L$/	ID-I→O[ROUND]	UMLAUT-L	ID-IO	UMLAUT
a. patn̥		*!		*
b. ☞ pœtn̥			**	

Non-triggering

(32) Non-triggering with /-YS/, *Hrafnus* 'Hrafn.NICKNAME'

/r̥apn-YS.NICKNAME/	ID-I→O[ROUND]	UMLAUT-L	ID-IO	UMLAUT
a. ☞ r̥apnYS				*
b. r̥œpnYS			*!*	

(33) Non-triggering with /-YR/, *dagur* 'day-NOM.SG.'

/taɣ-YR-MASC.NOM.SG/	ID-I→O[ROUND]	UMLAUT-L	ID-IO	UMLAUT
a. ☞ daːɣYR̥				*
b. dœːɣYR̥			*!*	

Local exceptions

- An important issue in exceptionality is how to capture an intuition that exceptional patterns can be subject to more strict locality than non-exceptional patterns.

(34) *X_L (Pater 2009)
Assign a violation mark to any instance of X that contains a phonological exponent of a morpheme specified as L

(35) *[-ATR][+ATR]$_L$ in Assamese
(Pater 2009; elaborating on Mahanta 2007)
Assign a violation mark to the minimal string containing a [-ATR] vowel followed by a [+ATR] vowel (that contains a phonological exponent of a morpheme specified as L)

- Minimal string "included to make explicit the locus of violation"
- Possibility that "indexed markedness can only generate non-iterative spreading" (except perhaps when involving floating features)

Umlaut locality

- The locality of the Icelandic Umlaut seems less strict
- Iterative Umlaut appears with some words, and not just with a floating feature trigger.
- *banani* 'banana' demonstrates variably iterative spread

(36) /banan+ʏm/ → [banœnʏm̥], [bœnʏnʏm̥], *[bananʏm̥], *[bœnanʏm̥] 'banana-DAT.PL.'

- The umlaut is different in some relevant sense, but the local exceptions theory will want to be precise about which aspects of the Umlaut allow exceptional iterative spread.

The iterative pattern

- The iterative pattern is sometimes described in terms of an optional vowel reduction [œ] → [ʏ] in unstressed positions, which thereby is a context for further spread (Rögnvaldsson 1981). In any case, the iterativity is sensitive to the stress pattern as shown by *Amanda* below (final -a analyzed as nominative, -ʏ in accusative, dative, genitive).
- Also demonstrates the (semi-)productivity of iterativity.

Loanword with Icelandic stress:

(37) /ˈamand-ʏ/ → /ˈamœnd-ʏ/, (?)/ˈœmʏnd-ʏ/

Loanword with Loan-stress:

(38) /aˈmand-ʏ/ → /aˈmœnd-ʏ/, */œˈmʏnd-ʏ/

Phonology or Morpheme Identity?

Two directions for Icelandic Umlaut research:

Phonology:

- Debate whether Icelandic has the rule or not
- Debate whether numerous exceptions can be patched up well enough

Morpheme Specific Phonology:

- Explore the status of locality of exceptions cross-linguistically
- Explore interactions of the exceptional pattern with other analyses and frameworks where the Umlaut data play a role

In other words, analyzing the Umlaut as an exception phenomenon is not giving up on doing phonology.

Conclusion

- A purely phonological generalization does not hold up empirically. Triggering must be associated with specific morphemes.
- The indexed constraints approach captures the fact that the effect is phonological, while positioning the umlaut within a literature on the nature of exceptional morpheme-associated triggering.
- These facts have a range of consequences for the analysis of Icelandic, but they also matter in a more broad theoretical context.