Chapter 5

U-umlaut in Icelandic and Faroese: Survival and death

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Although Icelandic and Faroese are closely related and very similar in many respects, their vowel systems are quite different (see e.g. Anderson 1969b; Árnason 2011). This paper compares *u*-umlaut alternations in Icelandic and Faroese and shows that the Faroese umlaut has a number of properties that are to be expected if the relevant alternations are morphological (or analogical) rather than being due to a synchronic phonological process. In Icelandic, on the other hand, *u*-umlaut has none of these properties and arguably behaves like a living phonological process. This is theoretically interesting because the quality of the vowels involved (both the umlaut trigger and the target) has changed from Old to Modern Icelandic. In addition, *u*-umlaut in Modern Icelandic is more opaque (in the sense of Kiparsky 1973) than its Old Icelandic counterpart, i.e. it has more surface exceptions. An epenthesis rule inserting a (non-umlauting) /u/ into certain inflectional endings is the cause of many of these surface exceptions. Yet it seems that *u*-umlaut in Icelandic is still transparent enough to be acquired by children as a phonological process. In Faroese, on the other hand, *u*-umlaut became too opaque and died out as a phonological rule. It is argued that this has partly to do with certain changes in the Faroese vowel system and partly with the fact that the *u*-epenthesis rule was lost in Faroese.

1 Introduction

Anderson put the process of *u*-umlaut in Icelandic on the modern linguistic map with the analysis he proposed in his dissertation (Anderson 1969b) and several subsequent publications (Anderson 1969a; 1972; 1973; 1974; 1976). Because of changes in the vowel system from Old to Modern Icelandic, the nature of the umlaut process changed somewhat through the ages (see e.g. Benediktsson 1959). The most important part of *u*-umlaut, and the only part that is alive in the modern language, involves /a/ ~ /ǫ/ alternations in the old language (phonetically [a] ~ [ɔ], as shown in 2), which show up as /a/ ~ /ö/ alternations in the modern language (phonetically [a] ~ [œ], cf. 2). This is illustrated in (1) with the relevant vowel symbols highlighted:

(1) Old Icelandic: Modern Icelandic:
    saga 'saga', OBL *sǫgu*, PL *sǫgur*   *saga*, OBL *sögu*, PL *sögur*
    hvass 'sharp', DAT *hvǫssum*   *hvass*, DAT *hvössum*
    tala 'speak', 1.PL *tǫlum*   *tala*, 1PL *tölum*

As these examples suggest, the quality of the root vowel /a/ changes when a /u/ follows in the next syllable. The relevant proecesses can be illustrated schematically as in (2). For the sake of simplicity I use conventional orthographic symbols to represent the vowels and only give IPA-symbols for the vowels that are important for the understanding of the umlaut processes. The umlaut-triggering vowels are encircled:[1]

(2) a. *u*-umlaut in Old Icelandic and the system of short vowels:

	[-back]		[+back]	
	[-round]	[+round]	[-round]	[+round]
[+high]	i	y		ⓤ [u]
	e	ø		o
[+low]	ę		a [a] ⟶	ǫ [ɔ]

    b. *u*-umlaut in Modern Icelandic and the system of monophthongs:[2]

	[-back]		[+back]	
	[-round]	[+round]	[-round]	[+round]
[+high]	í			ú [u]
	i	ⓤ [ʏ]		
[+low]	e	ö [œ] ⟵	a [a]	o [ɔ]

The gist of Anderson's analysis of *u*-umlaut can then be illustrated semi-formally as in the traditional generative phonological notation in (3), with the assimilating features highlighted (see also Rögnvaldsson 1981: 31, Þráinsson 2011: 89−90):[3]

(3) a. *u*-umlaut in Old Icelandic:
$$/a/ \rightarrow \left[\textbf{+round}\right] \; / \; \_C_0V\begin{bmatrix}\textbf{+round}\\ \text{+high}\\ \text{+back}\end{bmatrix}$$

    b. *u*-umlaut in Modern Icelandic:
$$/a/ \rightarrow \begin{bmatrix}\textbf{+round}\\ \textbf{-back}\end{bmatrix} \; / \; \_C_0V\begin{bmatrix}\textbf{+round}\\ \textbf{-back}\\ \text{-low}\end{bmatrix}$$

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[1] Note that in the representation of the Modern Icelandic vowel system, the accents over vowel symbols have nothing to do with quantity but simply denote separate vowel qualities. Thus /í/ is [i], /i/ is [ɪ], /ú/ is [u] and /u/ is [ʏ], as the schematic representation in (2) suggests.

[2] I am assuming here, like Þráinsson (1994) and Gíslason & Þráinsson (2000: 34), for instance, that Modern Icelandic only distinguishes between three three vowel heights and that /e/ [ɛ] and /ö/ [œ] are both phonologically [+low], like /a/ [a] and /o/ [ɔ]. For different assumptions see e.g. Árnason (2011: 60).

[3] Here, and elsewhere in this paper, I will use the kinds of formulations of rules and conditions familiar from classical generative phonology since much of the work on *u*-umlaut has been done in that kind of framework. For analyses employing more recent frameworks see Gibson & Ringen 2000, Hansson 2013 and Ingason 2016. Most of the argumentation in this paper should be relatively framework-independent, however.

As the illustration in (3) shows, the modern version of the umlaut is somewhat more complex than the old one, assimilating two features rather than one. Nevertheless, it is still arguably a phonologically (or phonetically) natural assimilation process, assimilating rounding and backness.

Although the *u*-umlaut discussion was most lively on the international scene in the 1970s (see e.g. Iverson 1978; Iverson & Anderson 1976; Orešnik 1975; 1977, cf. also Valfells 1967), the topic keeps popping up to this day, e.g. in journals and conferences dedicated to Scandinavian linguistics (see e.g. Gibson & Ringen 2000; Indriðason 2010; Þráinsson 2011; Hansson 2013) and even in recent master's theses and doctoral dissertations (see Markússon 2012; Ingason 2016). The main reason is that while *u*-umlaut in Modern Icelandic is obviously very productive, being applied consistently to new words and loanwords, it shows a number of intriguing surface exceptions. These have been discussed extensively in the literature cited but here I will concentrate on the most common and widespread one, namely the lack of umlaut before a /u/ that has been inserted between the inflectional ending /r/ and a preceding consonant. This epenthesis did not exist in Old Icelandic as illustrated in (4):

(4) Old Icelandic: Modern Icelandic:
     dalr 'valley', *latr* 'lazy'   *dalur*, *latur*

If *u*-umlaut is a phonological rule in the modern language, this *u*-epenthesis has to follow it, as it did historically. This is one of the properties of *u*-umlaut that have been used to argue for the necessity of relatively abstract phonological representations and derivations (e.g. Anderson 1969b; 1974; Rögnvaldsson 1981; Þráinsson 2011; Hansson 2013) while others have maintained that *u*-umlaut is not a phonological process anymore in Modern Icelandic and the relevant alternations are morphologized and purely analogical (see e.g. Markússon 2012) or at least "morpheme-specific", i.e. triggered by particular morphemes that may or may not contain a /u/ (Ingason 2016).[4]

In this paper I will compare *u*-umlaut alternations in Modern Icelandic and Modern Faroese. This comparison will show very clearly that *u*-umlaut in Modern Faroese has a

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[4] Ingason (2016: 220) formulates his umlaut rule as follows:

> Realize an underlying /a/ as /ö/ in the syllable which precedes the morpheme which triggers the umlaut.

As can be seen here, no mention is made of a triggering /u/ in the rule. The reason is that Ingason wants to derive all all paradigmatic /a/ ~ /ö/ alternations the same way, including the ones where /u/ has been syncopated historically. Thus he argues that the NOM.SG. morpheme -ø in feminine nouns like *sök* 'guilt, case' and the NOM./ACC.PL. morpheme -ø in neuter nouns like *börn* 'children' triggers umlaut the same way that the DAT.PL. morpheme -*um* does in *sökum* and *börnum*. But many researchers have wanted to distinguish between morphologically conditioned umlaut, where there is no triggering /u/, and phonologically conditioned umlaut triggered by /u/, e.g. Rögnvaldsson (1981). One reason for doing so comes from the behavior of loanwords like the adjective *smart* 'smart, chic'. Here the NOM.SG.F and the NOM/ACC.PL.N can either be *smart* or *smört*, i.e. a morphologically conditioned umlaut may or may not apply. But once an umlauting inflectional ending containing /u/ is added to the loanword *smart*, the *u*-umlaut becomes obligatory. Thus DAT.PL can only be *smört-um* and not *smart-um and the NOM.PL.WK form has to be *smört-u* and not *smart-u. This suggests that the morphologically conditioned umlaut is more prone to exceptions than the phonologically conditioned one, which is actually to be expected. Thanks to Eiríkur Rögnvaldsson for pointing this out to me.

number of properties (e.g. paradigm levelling, various kinds of exceptions, total absence from certain paradigms, inapplicability to loanwords …) that are to be expected if the relevant alternations are no longer due to a synchronic process. In Modern Icelandic, on the other hand, *u*-umlaut has none of these properties and behaves more like a phonological rule. This is of general theoretical interest since it illustrates how phonological rules can survive (in the case of Icelandic) despite reduced transparency (in the sense of Kiparsky 1973) and how changes in the phonological system can cause the death of a phonological rule (in the case of Faroese) and what the consequences can be.

The remainder of the paper is organized as follows: In §2 I first illustrate how the *u*-epenthesis works in Modern Icelandic and then present a couple of arguments for the phonological (as opposed to morphological) nature of Modern Icelandic *u*-umlaut. §3 first describes some facts about the Faroese vowel system that must have been important for the development of *u*-umlaut and then shows that *u*-epenthesis does not exist anymore as a phonological process in Modern Faroese. It is then argued that these developments led to the death of *u*-umlaut as a phonological process in Faroese. §4 then contains a systematic comparison of *u*-umlaut alternations in Modern Icelandic and Faroese, concluding that the Faroese ones must be analogical (and morphological) in nature as they do not exhibit any of the crucial phonological properties that Modern Icelandic *u*-umlaut alternations show. In Icelandic, on the other hand, *u*-umlaut does not show the non-phonological properties listed for its Faroese counterpart. §5 concludes the paper.

2 u-epenthesis and u-umlaut in Modern Icelandic

2.1 The epenthesis rule

The phoneme /r/ frequently occurs in Old Icelandic (Old Norse) as a marker of various morphological categories, including NOM.SG of strong masculine nouns and adjectives as illustrated in (5). It sometimes assimilated to a preceding consonant, e.g. /s, l, n/ (cf. 5c),[5] but it was deleted after certain consonant clusters, such as /gl, gn, ss/ (cf. 5d):

(5)   a.   *stór-r* 'big', *mó-r* 'peat', *há-r* 'high'
      b.   *dal-r* 'valley', *lat-r* 'lazy', *tóm-r* 'empty', *harð-r* 'hard'
      c.   *ís-s* 'ice', *laus-s* 'loose', *stól-l* 'chair', *fín-n* 'fine'
      d.   *fugl* 'bird', *vagn* 'wagon', *foss* 'waterfall' (stem *foss-*)

It is likely that the /r/ in words of type (5b) was syllabic in Old Icelandic. There are no syllabic consonants in Modern Icelandic, on the other hand. Instead a /u/ appears between the /r/ and the preceding consonant in the modern version of words of type (5b). There is historical evidence for this *u*-insertion from the late thirteenth century and

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[5] Assimilation to stem-final /l, n/ only happened in Old Icelandic if these consonants were preceded by long vowels, i.e. Old Icelandic diphthongs and vowels that are standardly represented by accented vowel symbols in Old Icelandic orthography, cf. *stól-**l*** 'chair' vs. *dal-r* 'valley', *fín-**n*** 'fine' vs. *lin-r* 'soft, limp', *heil-**l*** 'whole' vs. *hol-r* 'hollow'.

onwards (see e.g. Kristinsson 1992 and references cited there) and many linguists have argued that *u*-epenthesis is still a productive phonological process in Modern Icelandic (e.g. Anderson 1969b,a; Orešnik 1972; Rögnvaldsson 1981; Kiparsky 1984).[6] This implies that speakers distinguish between a *-ur*-ending where the underlying morpheme is #-r# and the /u/ is epenthetic (and does not trigger *u*-umlaut) and a *-ur*-ending where the /u/ is not epenthetic and the underlying morpheme is #-ur# (and the /u/ triggers *u*-umlaut). This contrast is illustrated in (6a) vs. (6b) (see also the examples in 1 and 4 above):

(6) a.   #dal+r#   'valley'   NOM.SG.M → *dal-**ur*** by epenthesis no umlaut
          #lat+r#   'lazy'   NOM.SG.M → *lat-**ur*** by epenthesis no umlaut
     b.   #sag+ur# 'sagas'   NOM.PL.F → *sög-**ur***   *u*-umlaut
          #tal+ur# 'numbers'   NOM.PL.F → *töl-**ur***   *u*-umlaut

Thus the NOM.SG ending #-r#, which is both found in strong masculine nouns like *dalur* 'valley' and in the strong masculine form of adjectives like *latur* 'lazy', does not have the same properties as the NOM.PL ending #-ur# which is found in feminine nouns like *sögur* 'sagas' and *tölur* 'numbers'. Despite their surface similarities in certain environments, speakers can clearly distinguish these endings. A part of the reason must be that the NOM.SG.M ending #-r# only shows up as *-ur* in phonologically definable environments, i.e. the modern version of words with stems of type (5b), whereas the NOM.PL.F ending #-ur# is not so restricted and always shows up as *-ur*. This is illustrated in Table 1 (compare the examples in 5).

Comparison of Table 1 and the Old Icelandic examples in (5) reveals a slight extension of *r*-deletion: The /r/ of the morphological ending #-r# is now deleted after /r/ (compare line d of the table to 5a) and after all instances of /s/, not just /ss/ (compare line d of the table to (5c,d)). The *u*-epenthesis illustrated in line b of Table 1 is an innovation, of course. Otherwise the NOM.SG.M ending behaves in much the same way as in Old Icelandic. The different behavior of the morphemes compared in Table 1 can be seen as an argument for distinguishing them in the underlying form, e.g. for not analyzing the N.SG.M ending as #-ur#.

2.2 Some phonological properties of Modern Icelandic u-umlaut

In this section I will mention two sets of facts which show that *u*-umlaut still has certain properties in Modern Icelandic that are to be expected if it is a phonologically conditioned process.

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[6] Orešnik later maintained that *u*-epenthesis could not be a synchronic rule in Modern Icelandic because of the existence of exceptional word forms like *klifr* 'climbing' (from the verb *klifra* 'climb'), *sötr* 'slurping' (from the verb *sötra* 'slurp'), *pukr* 'secretiveness' from the verb *pukra(st)* 'be secretive about', etc. (Orešnik 1978; see also the discussion in Kjartansson 1984). In words of this kind one would have expected *u*-epenthesis to apply. The importance of these exceptions is not very clear since this is a very special class of words (all derived from verbs ending in *-ra*) and it is typically possible or even preferred to apply the epenthesis rule to these forms, giving *klif**ur***, *söt**ur***, *puk**ur***, etc. For the sake of completeness it should be noted that the final *-r* in word forms like *sötr*, *pukr* has to be voiceless and this may be related to the fact that there are no syllabic consonants in Modern Icelandic, as stated above.

Table 1: Phonological realization of the inflectional endings #-r# and #-ur# in Modern Icelandic.

	type of stem	phonological realization of the NOM.SG.M ending #-r#	phonological realization of the NOM.PL.F ending #-ur#
a.	ending in a vowel	*-r* (*mó-r* 'peat', *há-r* 'high')	***-ur*** (*ló-ur* 'golden plovers')
b.	ending in a single consonant (but see c)	***-ur*** (*dal-ur* 'valley', *lat-ur* 'lazy')	***-ur*** (*sög-ur* 'sagas', *töl-ur* 'numbers')
c.	ending in a high vowel + /l,n/	assimilation (*stól-l* 'chair', *fín-n* 'fine')	***-ur*** (*spús-ur* 'wives', *súl-ur* 'columns', *dýn-ur* 'mattresses')
d.	ending in /s, r/ or consonant clusters ending in /l, n/ such as /gl, gn/	deletion (*ís* 'ice', *laus* 'loose', *foss* 'waterfall' *bjór* 'beer', *stór* 'big', *fugl* 'bird', *vagn* 'wagon')	***-ur*** (*ýs-ur* 'haddocks', *aus-ur* 'scoops', *hór-ur* 'whores', *ugl-ur* 'owls', *hrygn-ur* 'spawning fish', *byss-ur* 'guns')

First, if *u*-umlaut was morphologically conditioned and not phonologically, we would expect it to be restricted to certain morphological categories or parts of speech. It is not. It applies in the paradigms of nouns, adjectives and verbs when a /u/ follows in the inflectional ending (with the exception of the epenthetic /u/ already mentioned). This is illustrated in (7):

(7) a. *saga* 'saga', OBL.SG *sög-u*, NOM/ACC.PL *sög-ur*, DAT.PL *sög-um*
 b. *snjall* 'smart', DAT.SG.M *snjöll-um*, NOM.PL.WK *snjöll-u*
 c. *kalla* 'call', 1.PL.PRS *köll-um*, 3.PL.PST *kölluð-u*

The so-called *i*-umlaut is very different in this respect. It is clearly not alive as a phonological rule anymore but its effects can still be observed in the modern language in certain morphologically definable environments. As a result we can find near-minimal pairs of word forms where *i*-umlaut has applied in one member but not the other although the phonological conditions seem identical. Some examples are given in (8):

(8) a. *háttur* 'mode', DAT.SG *hætt-i/*hátt-i*, NOM.PL *hætt-ir/*hátt-ir*
 b. *sáttur* 'satisfied', NOM.SG.M.WK **sætt-i/sátt-i*, NOM.PL.M **sætt-ir/sátt-ir*

In (8a) we see examples of the paradigmatic alternation /á ~ æ/ (phonetically [au] ~ [ai] in the modern language, probably [a:] ~ [ɛ:] in Old Icelandic) originally caused by *i*-umlaut.

In the NOM.SG we have /á/ in the stem but in the DAT.SG the only acceptable form is *hætti* and the "non-umlauted" version **hátti* is unacceptable. Similarly, in the NOM.PL only *hættir* is acceptable and **háttir* is not. At a first glance we might think that an /i/ in the inflectional ending is still causing this "umlaut" but a comparison with the adjectival forms in (8b) indicates that this cannot be the case. Here the only acceptable weak NOM.SG.M form is *sátti* and not **sætti* and the only NOM.PL.M form is *sáttir* and not **sættir*. So the *i*-umlaut alternations in Modern Icelandic are clearly morphologically conditioned and not phonological anymore (see also Thráinsson 2011: 93 for further examples of this kind).

Second, recall that standard generative phonology formulations of *u*-umlaut in Icelandic of the kind illustrated in (3b) above state explicitly that /u/ only triggers umlaut of /a/ in the immediately preceding syllable. This is illustrated by examples like the following:

(9) a. *bakki* 'bank' DAT.PL *bökk-**u**m/*bakk-**u**m*
     b. *akkeri* 'anchor' DAT.PL **ökker-**u**m/akker-**u**m*

In (9a) the *u*-umlaut obligatorily applies to the root vowel /a/ in the immediately preceding syllable. In (9b), on the other hand, the /u/ in the (same) inflectional ending cannot apply to the root vowel /a/ because there is a syllable intervening. An interesting and much discussed case, e.g. by Anderson in several of the publications cited above, involves trisyllabic words with two instances of /a/ in the stem. Consider the examples in (10):

(10) a. *kalla* 'call'
        1.SG.PST *kalla-ð-i*, 1.PL.PST **kallö-ð-um/köllu-ð-um/*kallu-ð- um/*kölla-ð-**u**m*
     b. *banan-i* 'banana'
        DAT.PL *banön-um/bönun-um/*banun-um/*bönan-**u**m*

Consider first the conceivable 1.PL.PST forms of the verb *kalla* 'call'. Based on the formulation (3b) of the *u*-umlaut rule, one might have expected the form **kallöðum*, where the /u/ in the inflectional ending triggers *u*-umlaut of the /a/ in the preceding syllable. This is not an acceptable form, however. The reason is that in forms of this sort a "weakening" of unstressed /ö/ to /u/ is obligatory. This weakening is found in in many words, e.g. the plural of the word *hérað* 'district', plural *héröð* or (preferred) *hér**u**ð, meðal* 'medicine', plural *meðöl* or (preferred) *með**u**l*. It is not always obligatory but it seems that in the past tense of verbs of this sort it is. But once the (umlauted) /ö/ in **kallöðum* has been weakened to /u/ it obligatorily triggers *u*-umlaut of the preceding /a/ so *köll**u**ðum* is acceptable but **kallu ðum* is not. Finally, the form **köllaðum* is not acceptable either, since there *u*-umlaut would be applied across an intervening syllable, which is not possible, as we have seen (cf. 9b). The *u*-umlaut works in a similar fashion in the word *banani*, except that here the weakening of the second (and unstressed) syllable from /ö/ to /u/ is not obligatory. Hence *banön**u**m* is an acceptable form, with the /u/ in the final syllable triggering *u*-umlaut of the preceding /a/ to /ö/. But if this /ö/ is further weakened to

/u/, then *u*-umlaut of the first /a/ is obligatory and *bön**u**num* is an acceptable form but **banunum* is not.[7] As predicted by the formulation of the *u*-umlaut rule in (3b) a form like **bönanum* is unacceptable because there the *u*-umlaut would have applied across an intervening syllable. Facts of this sort have been interpreted as showing that *u*-umlaut in Modern Icelandic is of a phonological nature since it depends on syllabic structure (no syllables can intervene between the umlaut trigger and the target) and it can be applied iteratively (a /u/ which itself is derived by *u*-umlaut and subsequent independently needed weakening can trigger *u*-umlaut).

3 The conditions for u-umlaut in Modern Faroese

3.1 u-umlaut and the Modern Faroese vowel system

Modern Faroese has preserved some *u*-umlaut-like vowel alternations. A couple of examples are given in (11) (see also Þráinsson et al. 2012: 78, 100, passim):

(11)   *dag-ur* 'day', DAT.PL *døg-**um***; *spak-ur* 'calm', NOM.PL.WK *spøk-**u***

At first glance, these alternations seem very similar to the Icelandic ones described in the preceding sections. But while the *u*-umlaut alternations are arguably phonologically (or phonetically) natural in Modern Icelandic (see the diagram in 2b and the formulation in 3b), it will be claimed below that this is not the case in Faroese. To demonstrate this, it is necessary to look closely at the Faroese vowel system. Consider first the following schematic representation of Faroese *u*-umlaut of the type just illustrated, where the alleged umlaut trigger is encircled (cf. Þráinsson 2011: 98, Þráinsson et al. 2012: 33, compare Árnason 2011: 248–250):[8]

(12)   *u*-umlaut in Modern Faroese and the system of monophthongs:

	[-back]		[+back]	
	[-round]	[+round]	[-round]	[+round]
[+high]	i	y		ⓤ [uː/ʊ]
	e ⟶	ø [øː/œ]		o
[+low]	æ [ɛaː/a]		a	ɔ

Something like (13) would seem to be a possible formulation of a process of this kind in traditional generative phonology terms (compare 3b):

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[7] It is sometimes claimed that *bönönum* is also an acceptable form for some speakers. If this is so, it is possible that the /ö/ in the next-to-last syllable triggers *u*-umlaut (i.e. *ö*-umlaut!) of the /a/ in the first syllable. That would simply mean that the feature [−low] in the definition of the environment of the *u*-umlaut in (3b) would be omitted. But since there are no derivational (nor inflectional) morphemes containing an underlying /ö/ (i.e. an /ö/ that cannot have been derived by *u*-umlaut), this proposal cannot be tested independently of the iterative rule application, as pointed out by a reviewer.

[8] Vowel length is predictable in Faroese, as it is in Icelandic: Vowels are long in stressed open syllables, otherwise short. As illustrated in the brackets in (12), there is often a considerable difference in the phonetic realization of the long and short variants. This will be illustrated below. — It should be noted that Árnason (2011: 76) assumes a different analysis of Faroese monophthongs.

(13)　Possible phonological formulation of *u*-umlaut in Modern Faroese:

$$/\text{æ}/ \rightarrow \begin{bmatrix} \textbf{+round} \\ \textbf{-low} \end{bmatrix} \Big/ \_\_C_0V\begin{bmatrix} \textbf{+round} \\ \text{+back} \\ \textbf{-low} \end{bmatrix}$$

Presented this way, *u*-umlaut in Faroese looks like a fairly natural assimilation rule at a first glance.[9] But the facts are somewhat more complicated.

First, the alleged trigger /u/ is not too stable in Modern Faroese. The reason is that unstressed /i,u/ are not distinguished in all Faroese dialects. In some dialects they merge into an [ɪ]-like sound, in others into an [ʊ]-like sound but some dialects distinguish them as [ɪ] and [ʊ] (see Thráinsson et al. 2012: 27, and references cited there). This situation has clearly added to the phonological opacity of *u*-umlaut alternations for speakers acquiring Faroese.

Second, the target of the *u*-umlaut in Faroese is arguably a "moving" one. As indicated in (12), the umlaut affects the phoneme represented there as /æ/. As the orthography suggests, it is a descendant of Old Norse /a/ in words like *dagur*, *spakur* (see 11). It is realized phonetically as [ɛa:] when long and [a] when short, as shown in (12), cf. *spakur* [spɛaːʰkʊɹ] 'calm', SG.N *spakt* [spakt] (see Thráinsson et al. 2012: 34 passim). But in the history of Faroese Old Norse /a/ [a] and /æ/ [ɛː] merged so the phoneme represented here as /æ/ can also be a descendant of Old Norse /æ/ and then it is represented in the spelling as 'æ', cf. *trælur* [tʰɹɛaːlʊɹ] 'slave', *æða* [ɛaːva] 'eider duck'. Words written with 'æ' show the same alternation between long [ɛa:] and short [a] as demonstrated for *spakur* and *spakt* above (e.g. *vænur* [vɛaːnʊɹ] 'beautiful' SG.M vs. *vænt* [vaṇt], cf. Thráinsson et al. 2012, p. 34). Yet it seems that *u*-umlaut is rarely if ever found in the 'æ'-words. Thus the DAT.PL of *trælur* is *trælum* and not **trølum* (compare DAT.PL *dølum* of *dalur* 'valley') and although the words *æða* 'eider duck' and *aða* '(big) mussel' sound the same, i.e. as [ɛaːva], the DAT.PL of the former has to be *æðum* [ɛaːvʊn] and *øvum* [øːvʊn] can only be DAT.PL of *aða*.[10]

To further complicate matters, the development of Old Norse /a/ in Faroese has left "room" for a "regular /a/" in the Faroese vowel system, as shown in the diagram in (12). It occurs in loanwords and is realized as [a:] when long and [a] when short, cf. *Japan* [jaːʰpan], *japanskur* [jaˈpʰanskʊɹ] 'Japanese'.[11] It does not seem that this vowel ever undergoes *u*-umlaut in Faroese (for further discussion see §4).

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[9] A reviewer suggests, however, that a process changing rounding and height as formulated for Faroese in (13), might be less natural from the point of view of acoustic phonetics than a process changing rounding and backness the way the *u*-umlaut rule in Modern Icelandic does according to (3): The former affects both F1 (for the height difference) and F2 (for rounding) whereas the latter affects F2 in opposite directions (raising it for fronting but lowering it for rounding). Thus the Modern Icelandic *u*-umlaut rule would "generate more similar input-output mappings", which may be preferred to less similar ones.

[10] A reviewer points out that the fact that *u*-umlaut does not apply do 'æ'-words in Faroese suggests that "*u*-umlaut had already taken on a morphological character before /a/ and /æ/ merged." But since there are no written records of Faroese from 1400–1800, the historical development of the language is very murky.

[11] In the noun *Japan* the stress falls on the first syllable, in the adjective *japanskur* it falls on the second one as indicated. Hence the quantity alternation in the first vowel.

Finally, there is no *u*-epenthesis in Modern Faroese to "explain away" apparent exceptions to *u*-umlaut as will be shown in the next section.

3.2 The lack of u-epenthesis in Modern Faroese

Now recall that the most obvious surface exception to *u*-umlaut in Modern Icelandic is due to the *u*-epenthesis described above. This rule creates -*ur*-endings that do not trigger *u*-umlaut. It was argued that this epenthesis rule is still productive in Icelandic, witness the fact that it only applies in phonologically definable environments. Hence there is a clear distributional difference between -*ur*-endings produced by the epenthesis rule (and not triggering *u*-umlaut) and -*ur*-endings where the /u/ is a part of the underlying form (and triggers umlaut). This is not the case in Faroese, where the ending -*ur* as a marker of the NOM.SG of strong masculine nouns and adjectives, with a /u/ that was historically inserted by epenthesis, has been generalized to all environments. Hence it has become distributionally indistinguishable from other -*ur*-endings. Table 2 compares the phonological realization of the NOM.SG.M #-r#-ending in Modern Icelandic to its Modern Faroese counterpart (see also Þráinsson 2011: 100):

Table 2: Phonological realization of a strong NOM.SG.M-ending in Modern Icelandic and Modern Faroese.

	type of stem	phonological realization of a strong NOM.SG.M ending in Modern Icelandic	phonological realization of a strong NOM.SG.M ending in Modern Faroese
a.	ending in a vowel	-*r* (*mó-r* 'peat', *há-r* 'high')	**-*ur*** (*mó-ur/mógv-ur* 'peat', *há-ur* 'high')
b.	ending in a single consonant (but see c)	**-*ur*** (*dal-ur* 'valley', *lat-ur* 'lazy')	**-*ur*** (*dal-ur* 'valley', *lat-ur* 'lazy')
c.	ending in a high vowel + /l,n/	assimilation (*stól-l* 'chair', *fín-n* 'fine')	**-*ur*** (*stól-ur* 'chair', *fín-ur* 'fine')
d.	ending in /s, r/ or consonant clusters like /gl, gn/	deletion (*ís* 'ice', *laus* 'loose', *foss* 'waterfall', *stór* 'big', *fugl* 'bird', *vagn* 'wagon')	**-*ur*** (*ís-ur* 'ice', *leys-ur* 'loose', *foss-ur* 'waterfall', *stór-ur* 'big', *fugl-ur* 'bird', *vagn-ur* 'wagon')

This has clearly made the *u*-umlaut rule in Faroese more opaque since now the non-umlauting and umlauting *ur*-endings occur in the same phonological environments. It seems very likely that this has contributed to the death of *u*-umlaut as a phonological process in Faroese.

4 Testing the predictions

In the preceding discussions I have described /a ~ ö/ alternations in Modern Icelandic and their Modern Faroese counterparts. I have argued that the Icelandic alternations are still governed by a synchronic phonological process. Although these alternations are still found in Modern Faroese, I have argued that they cannot be governed by a phonological rule. Instead they must be morphologically governed or analogical. This analysis makes several testable predictions (see Thráinsson 2011: 100–102).

First, we do not a priori expect phonologically conditioned alternations to be restricted to particular morphological categories whereas morphologically conditioned alternations obviously are, by definition. As we have already seen, the Icelandic *u*-umlaut occurs in the inflectional paradigms of nouns, adjectives and verbs and in various grammatical categories (cases, numbers, tenses, persons …). Its Faroese counterpart behaves differently. It is found in the inflectional paradigms of nouns and adjectives, as we have seen (cf. 11), but not in the past tense forms of verbs, where it would be expected on phonological grounds. Thus we have *við kölluðum* in Icelandic vs. *vit kallaðu* in Faroese for 1.PL.PST 'we called', and *við frömdum* vs. *vit framdu* in Faroese for 1.PL.PST 'we did, made'.

Second, a phonological rule should not allow analogical extensions to forms that do not fit its structural conditions. Such extensions are not found for Icelandic *u*-umlaut but in Faroese they are very common. Thus the /ø/ of the oblique cases *søgu* 'saga' has been analogically extended to the NOM.SG form *søga* and many other words of a similar type. The corresponding form **söga* is unacceptable in Icelandic.[12]

Third, a phonologically conditioned rule should apply whenever its structural conditions are met. Thus we would not expect to find inflectional forms in Icelandic where *u*-umlaut fails to apply in an appropriate environment. Such examples are very common in Faroese, on the other hand. Thus the DAT.PL of the noun *rakstur* 'shave' in Faroese is *rakstrum* and not the expected **røkstrum*, the DAT.PL of *spakur* 'calm' can either be *spøkum* or *spakum*, etc. (see Thráinsson et al. 2012: 79, 100, passim). Corresponding unumlauted forms are unacceptable in Icelandic.

Fourth, there is evidence for "iterative" application of *u*-umlaut in Icelandic, with one application of the *u*-umlaut rule feeding another. This was discussed above (second part of §2.2) in connection with forms like 1.PL.PST *kölluðum* '(we) called' and DAT.PL *bönunum* 'bananas'. No such evidence is found in Faroese, where the corresponding forms are *kallaðum* and *bananum*.[13]

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[12] As a reviewer reminds me, the Icelandic neologism for *computer* is interesting in this connection. It was supposed to be *tölva* (related to the word *tala* 'number' — this was when computers were mainly used for computing) in NOM.SG, oblique singular cases *tölvu*. In Proto-Nordic time /v/ could trigger umlaut of /a/ to /ǫ/ so we have Old Norse words like *vǫlva* 'sooth-sayer, witch'. But since /v/ is not a trigger of umlaut in Modern Icelandic (witness loanwords like *salvi* 'salve, cream'), speakers tend to use the form *talva* for NOM.SG, thus in a way undoing the underlying /ö/ in the nominative as if they are "assuming" that the /ö/ in the oblique cases is derived by a synchronic *u*-umlaut from /a/, as in words like *saga* 'saga', oblique *sögu* (for some discussion see Thráinsson 1982).

[13] The latter form may be related to the fact that *banan* 'banana' is a loanword and contains the vowel /a/ (long variant [aː]) and not /æ/, cf. the discussion in §3.1. See also the next paragraph.

Finally, Icelandic *u*-umlaut is so productive that it is naturally applied in loanwords, as we have seen. This is not so in Faroese. Thus the word *app* (for a small program) has been adopted into both languages. In Icelandic the DAT.PL has to be ***öppum*** whereas the natural form is ***appum*** in Faroese. This can easily be verified by searching for the word combinations *með öppum* and *við appum* 'with apps' on Google. For the first variant one finds a number of Icelandic hits, for the second Faroese ones.

The general conclusion, then, is that *u*-umlaut in Modern Icelandic has a number of properties that are to be expected if it is a phonological process but none of the properties one might expect of morphologically conditioned or analogical alternations.

5 Concluding remarks

While it has often been argued that phonology need not be "natural" (see e.g. Anderson 1981), there must obviously be limits to the "unnaturalness" and opacity of phonological processes. Once they become too unnatural and opaque, they can no longer be acquired as such and the phonological alternations originally created by them will be relegated to morphology. Then their productivity will be limited and it will at best survive to some extent by analogy, but analogical processes are known to be irregular and unpredictable. The fate of *i*-umlaut in Icelandic is a case in point, as described above (see the discussion of the examples in 8). But whereas we do not have detailed information about how *i*-umlaut died as a phonological process, comparison of the development of *u*-umlaut in Icelandic and Faroese sheds an interesting light on how a phonological rule can die and how it can survive despite changing conditions.

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