

CONTRASTIVE VOWEL FEATURES IN WEST GERMANIC*

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1. Introduction

The insight that phonological change may involve a reorganization of the contrasts of a language goes back to Jakobson (1972 [1931]), who argued for a structuralist phonemic approach (see Salmons & Honeybone to appear). Richard Hogg (1992) showed that his Neogrammarian predecessors were unable to give a satisfactory account of developments in early Old English because they lacked a contrastive phonemic perspective. I argue that some of these phonemic insights are not expressible in a theory that requires full specification of underlying segments. They can be recaptured, however, if underlying forms are specified only for contrastive features. My analysis also suggests a new solution to a phonologization paradox posed by Janda (1999) and Kiparsky (to appear).

2. The Prehistory of Old English $\text{æ}:$: An Unnecessary Detour?

One example concerns the prehistory of early Old English long $\text{æ}:$. Since the corresponding vowel in Proto-Germanic is assumed to have also been $\text{*}\text{æ}:$, Wright & Wright (1925) had proposed that $\text{æ}:$ simply persisted into the Old English period. For example, Proto-Germanic $\text{*}\text{æ}:$ appears in Old English (West Saxon) as *dæd* ‘deed’; before nasals it retracts to ō as in *mōna* ‘moon’.

Against this view is historical and comparative evidence which appears to show that it was a back vowel, $\text{*}\text{a}:$, in West Germanic. For example, the long low vowel in Latin loanwords such as *strāta* ‘street’ was borrowed as Germanic $\text{*}\text{a}:$. In other West Germanic languages, this vowel develops as *a*; as in Old High German *tāt* ‘deed’ and *māno* ‘moon’. The version of events accepted by most other writers therefore posits, as in (1), that Proto-Germanic $\text{*}\text{æ}:$ retracted to $\text{*}\text{a}:$ in West Germanic; this vowel remained in Old High German, but fronted again to $\text{*}\text{æ}:$ in Old English when not before a nasal.

(1) Development of Proto-Germanic $\text{*}\text{æ}:$: (conventional view)

	Proto-Germanic	$\text{*}\text{æ}:$		
	West Germanic	$\text{*}\text{a}:$		
Old English	<i>elsewhere</i>	$\text{æ}:$	Old High German	<i>a</i> :
	<i>before nasals</i>	ō :		

* Thanks to Tom Purnell and Eric Raimy, whose analysis inspired the one proposed here, and Patrick Honeybone and Joe Salmons for bringing their work to my attention. I am grateful to members of the project on Markedness and the Contrastive Hierarchy in Phonology at the University of Toronto (Dresher and Rice 2007). This research was supported in part by grant 410-08-2645 from the Social Sciences and Humanities Research Council of Canada.

2.1 The Phonemic Approach of Hogg (1992)

Hogg (1992: 61–3) considers not just the phonetic value of this vowel, but also its phonemic status at each stage of the language. This approach results in a richer picture of its development. He assumes, as in the traditional account, that */æ:/ was a contrastively front vowel in early Proto-Germanic (2a). Later (2b), */a:/ merged with */o:/, leaving */æ:/ as the only low vowel phoneme. Hogg proposes that this vowel was contrastively neutral with respect to the front/back dimension; therefore, it can be represented as */a:/, whatever its precise phonetic character. Since it could act neutrally with respect to backness, it appeared to earlier writers as though it were a back vowel in early West Germanic. Hogg suggests that this phoneme may have nevertheless been phonetically front throughout in the dialects that developed into Old English.

(2) Proto-Germanic and West Germanic long vowel systems (Hogg 1992)

a.	Proto-Germanic	
	*/i:/	*/u:/
	*/e:/	*/o:/
	*/æ:/	*/a:/
b.	West Germanic	
	*/i:/	*/u:/
	*/e:/	*/o:/
		*/a:/

At a later period, a contrasting low back vowel /a:/ developed in Old English from the monophthongization of older */ai/ which merged with retracted */a:/ before nasals. This new phoneme created a backness contrast which led to a reanalysis of the original low vowel to a contrastively front vowel /æ:/ (3).

(3) Early Old English long vowel system (Hogg 1992)

/i:/	/u:/
/e:/	/o:/
/æ:/	/a:/

Hence, the alleged shift of Proto-Germanic */æ: to West Germanic */a: and then back to */æ: in Old English and Old Frisian emerges as an artefact of a non-phonemic theory. A phonemic perspective allows for a simpler sequence of development: the phonetic value of */æ:/ may have remained relatively unchanged from Proto-Germanic to Old English, though its contrastive status changed (4).

(4) Phonemic and phonetic development of Proto-Germanic */æ: (Hogg 1992)

	a. Phonemic	b. Phonetic
Proto-Germanic	*/æ:/	*[æ:]
West Germanic	*/a:/	*[æ:]
Old English	*/æ:/	*[æ:]

Hogg (1992: 77f.) suggests that short */a/ developed in parallel with the long low vowel. Proto-Germanic had only four short vowels, as in (5a). Like the long low vowel, West Germanic */a/ was neutral with respect to the front/back dimension, though it appears to have had a more back pronunciation than */a:/. At some point */u/ lowered before non-high vowels, eventually creating a new phoneme */o/. After this, West Germanic had five short vowels (5b) to match the five long vowels we saw earlier in (2b).

(5) Proto-Germanic and West Germanic short vowel systems (Hogg 1992)

a.	Proto-Germanic		
	*/i/		*/u/
	*/e/		
		*/a/	
b.	West Germanic		
	*/i/		*/u/
	*/e/		*/o/
		*/a/	

In parallel with the long low vowel, in early Old English */a/ became a contrastively [-back] vowel, */æ/. Following Hogg (1992: 14), I will assume that there developed a new phoneme */ɑ/, as in (6), though the contrast between it and */æ/ was at best marginal, and may have varied by dialect.¹

(6) Early Old English short vowel system (Hogg 1992)

/i/	/u/
/e/	/o/
/æ/	/ɑ/

2.2 Incorporating Hogg's Insight into a Generative Analysis

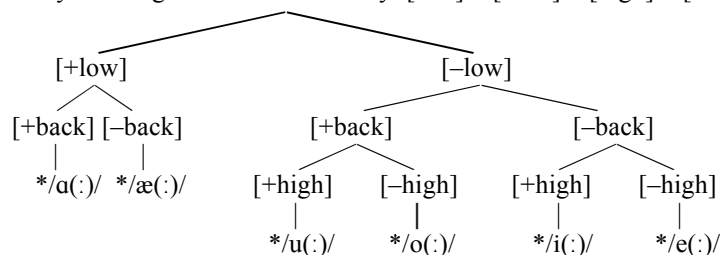
Having set out the main aspects of Hogg's phonemic analysis of the development of the low vowels, let's now turn to see how it can be incorporated into a generative grammar. In terms of distinctive features, Hogg's discussion suggests that the West Germanic low vowels */a:./ and */a/ should not be specified as being either [+back] or [-back]. This kind of contrastive underspecification cannot be expressed in a theory that requires full specification of features.

To translate Hogg's insight into an explicit theory, we can borrow an idea from Jakobson and his collaborators (Jakobson, Fant & Halle 1952, Jakobson & Halle 1956), namely (7):

¹ This change, known as the first fronting (or Anglo-Frisian brightening), could have occurred even without the development of a new [+back] phoneme */ɑ/, simply by extending the scope of the [±back] contrast to include the low vowel.

system by simply extending the [back] contrast to the [+low] branch, as shown in (9); to simplify the diagram, I will henceforth omit the length contrast.

- (9) Early Old English feature hierarchy: [low] > [back] > [high] > [long]



3. Contrast Shift: A New Perspective on the Phonologization of *i*-umlaut

At some point, the contrastive organization of the Old English vowel system shifted.² The key evidence for this assertion involves *i*-umlaut, whereby a back vowel followed by *i* or *j* is fronted. For example, *u(:) becomes y(:), as in ‘evil’ (10a), and *o(:) becomes ø(:), as in ‘feet’ (10b).³

- (10) *i*-umlaut of *u(:) and *o(:)
- | | | |
|-----------------------------|--------------------|--------------------|
| Gloss | a. ‘evil NOM. SG.’ | b. ‘foot NOM. PL.’ |
| Pre-Old English | *uʃil | *fo:t+i |
| <i>i</i> -umlaut | *yʃil | *fø:t+i |
| <i>i</i> -lowering/deletion | yʃel | fø:t |

Notice that *i*-umlaut results in front rounded vowels: in (10), the front feature comes from the /i/, and the round feature must come from /u/ and /o:/. We have assumed, however, that [round] is not a contrastive feature of the earliest stage of Old English. Recall the representations given by the feature hierarchy in (9): changing non-low [+back] vowels to [-back] in this structure would result in *[i(:)] and *[e(:)], not [y(:)] and [ø(:)]. To obtain front rounded vowels, the non-low [+back] vowels must also be [+round].

Therefore, following many commentators, beginning with V. Kiparsky (1932) and Twaddell (1938), I assume that *i*-umlaut began as a late phonetic, that is, postlexical, rule (see also Penzl 1972). In other words, it applies after the

² The notion that contrast shift is a type of grammar change has proved to be fruitful in the study of a variety of languages. Examples include: Zhang (1996) and Drescher and Zhang (2005) on Manchu; Barrie (2003) on Cantonese; Rohany Rahbar (2008) on Persian; Drescher (2009: 215–225) on East Slavic; Compton & Drescher (2011) on Inuit; Gardner (2012), Roeder & Gardner (2013), and Purnell & Raimy (2013) on North American English vowel shifts; and large-scale studies by Harvey (2012) on Ob-Ugric (Khanty and Mansi), Ko (2010, 2011, 2012) on Korean, Mongolic, and Tungusic, and Oxford (2012a, b) on Algonquian.

³ The *i*-umlaut of low vowels and diphthongs is more complicated, and I will skip that here.

[-low, +back] features of /u/ have been *enhanced* by lip rounding (Stevens, Keyser & Kawasaki 1986; Hall 2011).

3.1 A Phonologization Paradox

Already in early Old English, the */i/ trigger of *i*-umlaut was either lowered after a light syllable or deleted after a heavy syllable, making *i*-umlaut opaque on the surface, as shown in the last row of (10). In many cases, the *i*-umlaut trigger became unrecoverable to learners. According to standard accounts, this led to the phonologization of [y(:)] and [ø(:)] as new phonemes; an example is ‘evil’, whose underlying form is restructured from /ufil/ to /yfel/ (11a). I assume that *i*-umlaut persisted as a synchronic rule in forms with alternations, like *fo:t* ~ *fø:t* ‘foot ~ feet’ (11b).

(11)	Phonologization of <i>i</i> -umlaut		
	Gloss	a. ‘evil NOM. SG.’	b. ‘foot NOM. PL.’
	Underlying	/yfel/	/fo:t+i/
	<i>i</i> -umlaut	—	fø:t+i
	<i>i</i> -lowering/deletion	—	fø:t

There is a logical problem with this scenario that has been pointed out many times in the literature, most recently by Kiparsky (to appear):⁴ as long as *i*-umlaut remains postlexical, it should not be able to survive the loss of its triggering contexts. Thus, in the example in (12), once /ufil/ is restructured to /ufel/, there is no reason for *i*-umlaut to continue to apply; the expectation is that [yfel] would revert to [ufel].

(12)	Expected non-phonologization of <i>i</i> -umlaut
a.	Before loss of <i>i</i> -umlaut trigger
	<i>Lexical Phonology</i>
	Underlying /ufil/
	<i>Postlexical Phonology</i>
	<i>i</i> -umlaut yfil
	<i>i</i> -lowering yfel
	Surface [yfel]
b.	After loss of trigger
	<i>Lexical Phonology</i>
	Underlying /ufel/
	<i>Postlexical Phonology</i>
	<i>i</i> -umlaut —
	Surface *[ufel]

The only way for *i*-umlaut to persist is if it enters the lexical phonology *before* the [y(:)] and [ø(:)] allophones become contrastive, that is, while they are

⁴ See Janda (1999) for discussion and review of scholars who have pointed out this problem and for various attempts to resolve this problem. I am grateful to Kathleen Currie Hall for calling my attention to Janda’s article.

still predictable allophones of [u(:)] and [o(:)], respectively (13a). Then, the subsequent loss of the triggering *i* or *j* will not affect the results of *i*-umlaut, which can then be lexicalized (13b).

(13) Phonologization of *i*-umlaut

a. Before loss of *i*-umlaut trigger 2

<i>Lexical Phonology</i>	
Underlying	/ufil/
<i>i</i> -umlaut	yfil
<i>Postlexical Phonology</i>	
<i>i</i> -lowering	yfel
Surface	[yfel]

b. After loss of trigger

<i>Lexical Phonology</i>	
Underlying	/yfel/
<i>i</i> -umlaut	—
<i>Postlexical Phonology</i>	
Surface	[yfel]

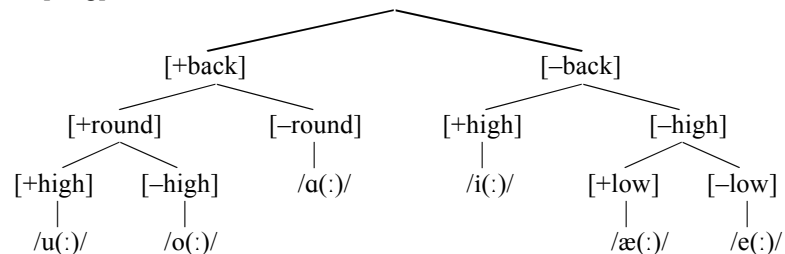
Why does *i*-umlaut enter the lexical phonology while its products are not contrastive? Kiparsky (to appear) suggests that it is because the new rounded allophones are more perceptually *salient* than their triggers (cf. Jakobson, Fant & Halle 1952). According to Kiparsky, the fact that salient phones can become quasi-phonemic without being distinctive “severs the structuralist link between contrastiveness (unpredictable distribution), a structural notion, and distinctiveness, a perceptual notion...The upshot is that while delinking contrastiveness and distinctiveness in a sense preserves the phoneme as a theoretical construct, it does so only by negating the founding intuition behind it.”

3.2 Contrast Shift and the Phonologization of Predictable Allophones

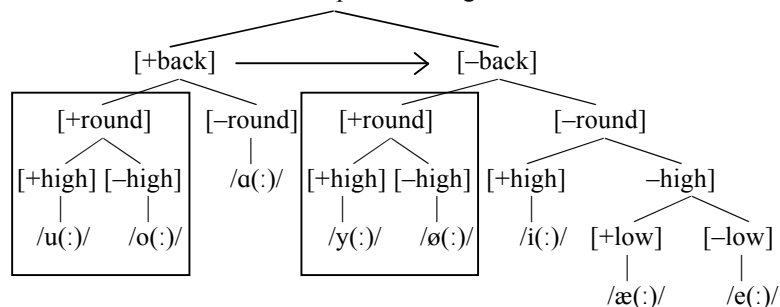
The contrastive analysis presented earlier, together with the notion that contrast shift is a type of grammar change, allows us to keep the more appealing aspects of Kiparsky’s analysis, while still maintaining the Contrastivist Hypothesis and the phoneme as a contrastive unit.

Let us revisit the early stage of *i*-umlaut as a postlexical and post-enhancement rule. Adapting Kiparsky’s formulation, I propose that the perceptual salience of the rounded allophones could have led learners to hypothesize that [round] is a contrastive feature. Recall that this had not been the case in West Germanic until some point in early Old English, where I have assumed that the governing feature hierarchy is as in (9). But another feature hierarchy can be constructed that includes [round] as a contrastive feature. This hierarchy requires demoting [low] to allow [round] to be contrastive over the non-low back vowels. This new hierarchy is illustrated in (14). Now changing the [+back, +round] vowels to [–back] results in new front rounded vowels (15), which begin as allophones.

- (14) Early Old English feature hierarchy 2: [back] > [round] > [high] > [low] > [long]

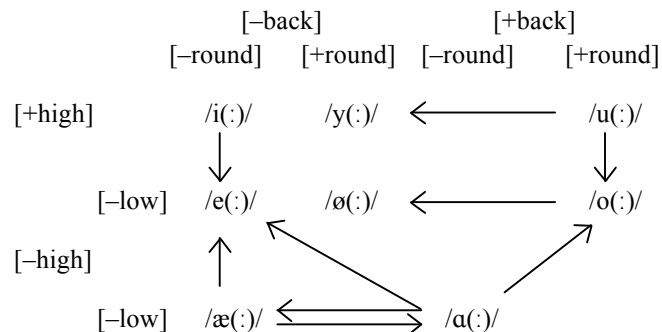


- (15) Creation of front rounded allophones using contrastive features



Although they are allophones, they can arise in the lexical phonology because they consist only of contrastive features. They are thus what Moulton (2003) calls ‘deep allophones’, referring to the Old English voiced fricatives which also arise in the lexical phonology. Deep allophones are possible because contrastive features are not all necessarily unpredictable in a hierarchical approach. For example, all the non-low vowels in (8) and (9) have a value for [high]; since the [+low] vowels lack a contrastive value for [high], it follows that vowels that are [+high] or [-high] are predictably [-low]. Nevertheless, we do not therefore remove the [-low] specification from the non-low vowels, because it serves a contrastive function at its level of the hierarchy, to distinguish the [+low] vowels from the [-low] vowels.

- (16) Old English vowel activity



The arrows in (16) schematically show the major types of vowel activity in Old English, abstracting away from vowel length: fronting (*i*-umlaut), backing, lowering of high vowels, and raising and rounding of low vowels. In the proposed feature hierarchy, all the active features are contrastive.

4. Conclusion

To conclude, I have proposed that phonology operates on contrastive features assigned by hierarchies that can vary across dialects and over time. Evidence for this approach comes from the fact that contrastive specifications can capture observed patterns of phonological activity. Equally significant, like the dog that didn't bark, is the activity that we do *not* find, as predicted from the absence of features that are non-contrastive in the proposed analyses.

Specifically, I have shown how we can incorporate Hogg's proposal for understanding the evolution of the low vowels from Proto-Germanic through West Germanic and into Old English. We can also retain and elaborate on the core of Kiparsky's account of the phonologization of *i*-umlaut, while adhering to the view that the phoneme is a contrastive unit. Finally, this approach gives us a way to implement the Jakobsonian structuralist program for diachronic linguistics in a generative framework.

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