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EARLY MIDDLE ENGLISH VOWEL QUANTITY, UNIVERSAL TENDENCIES AND THE EXPLANATION OF SOUND CHANGE

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One of the purposes of historical linguists is to discover and describe correspondences between different diachronic stages of different languages, and the study of sound change is a field of particular interest. One way of stating observed patterns or regularities is by rules which relate well defined sets of corresponding items to each other. Thus, the Early Middle English sound change called Open Syllable Lengthening has come to be thought of in terms of a rule of the format

$$(1)\ V \longrightarrow [+\text{long}] / \# X \left[\begin{matrix} +\text{STRESS} \\ -\text{high} \end{matrix} \right] \$ Y \#$$

where Y does not include any $.

This rule relates the stressed vowels of disyllabic words such as *maken, beaver* or *hope* in the English before the change to their long counterparts in the English after it.

However, the scientific status and explanatory value of such rules has been a matter of discusion ever since the hey-day of the Neogrammarians. More specifically, it has been the question how they compared to natural laws as are common in hard sciences such as physics.

The Neogrammarians themselves liked to regard the rules underlying all sound changes as proper 'sound laws'. Basically, their view rested on the belief that just asd the laws of physics – 'sound laws' applied without exception. At the same time, however, it was more or less neglected that

> such formulations lack one of the most elementary requirements of a scientific law, that the limits within which it applies be stated in general terms. That is, it should not mention specific times or places or employ proper names.
>
> (Greenberg 1978:64)

Thus, the OPEN SYLLABLE LENGTHENING RULE given above does not, unless by pure chance, apply to any sound change apart from the Middle English one. Therefore, its explanatory or predictive value is as good as zero. The same is true of all other 'sound laws', such as Grimm's law or Verner's law, as well.

Naturally, this state-of-affairs prompted linguists who were dissatisfied with it to try and come up with more universal rules for the description of language change. A group that have gone rather far in that direction are the proponents of natural phonology as represented by Stampe or Dressler, for example.

The type of rules they have come up with can be illustrated by an example from Patricia Donegan's discussion of the *Natural phonology of vowels* (1979). The section on palatalization contains the rule

$$(2)\ \left[\begin{array}{c} V \\ \text{-labial} \\ \text{!higher} \\ \text{!/}\left[\begin{array}{c} V \\ \text{+labial} \end{array}\right] \end{array}\right] \longrightarrow [\text{+palatal}]$$

(cf. Donegan 1979:91)

This formulation collapses two rules and can be read as "The probability of a non-palatal vowel to be palatalized rises in proportion to its height and is greater if it is immediately followed by a labial vocalic element than if it is not." In order to support the claim that this rule should be of universal validity ample evidence from language acquistion as well as from many different languages is provided (cf. Donegan 1979: 91-105).

This type of universalist approach to language change has not remained uncriticized, however, and Donegan's rule serves well to illustrate some major lines of attacks. First, in spite of their supposed universality, rules like the above are still a far cry from anything like a hard natural law. This is because, instead of making exact predictions, they mention only relative probabilities and are therefore of very little explanatory value themselves. This weakness gives the impression that statements of universal tendencies are not any better than traditional sound laws in this respect, with the latter being able to serve at least as adequate descriptions of what actually happened in particular languages at particular times. This points to the second weakness of universal tendencies, namely that it seems difficult for them to bridge the gap to particular events in particular languages altogether. That is, knowing a certain universal tendency, one can still not explain why it should have led to sound changes in some languages during special periods while having no such impact

in other languages or at other times. Therefore, it might be concluded that historical linguists should give up hopes of finding universal explanations of language changes altogether, and should be content with aiming at the most adequate and elegant descriptions of particular events, instead. For those purposes, then, rules of the traditional sound law format seem to serve much better than statements of probabilities, because, contrary to the latter, they are normally assumed to apply with a probability of 1, which makes them more precise descriptive tools.

In this paper the evidence of Early Middle English changes of vowel quantity is going to be adduced to shed some light on the controversy between what might be called the particularist/descriptive and the universalist or explanatory approaches to language change. In particular, attention will be drawn to the fact that Middle English changes of vowel quantity cannot be described more adequately by non-statistical rules than by statistical ones. Furthermore, it will be shown that the statistical laws which describe the changes in question most adequately seem to mirror exactly such universal tendencies as are proposed in Natural Phonology. Finally, a potential way of explaning the particular effect which those tendencies seem to have had at the beginning of the Middle English period will be sketched.

First, recall the data. There are four quantity changes by which Early Middle English vowels are generally assumed to have been affected.

Homorganic Lengthening (HOL) made short vowels long if they were followed by certain consonant groups (namely: *mb, nd, ng, ld, rd, rs, rð, rn, rl*), unless those groups were themselves followed by a consonant. For example, it turned *bindan* into *bīndan, cild* into *cīld*, or *climban* into *clīmban*.

Open Syllable Lengthening (OSL) lengthened mainly non-high (but see below) short vowels if no consonant followed them within the same syllable. Thus, it changed *ma-ken* into *mā-ken, we-ven* into *wē-ven* or *hopen* into *hō-pen*.

Shortening before Consonant Clusters (SHOCC) made long vowels short if they were followed by a group of two consonants with the exception of the groups listed above (since the latter caused lengthening, they could not of course simultaneously cause shortening) and of some other consonant groups, such as: *pl, pr, cl, tr*, which were also found at the beginning of syllables.

Trisyllabic Shortening (TRISH), finally, shortened long vowels in the antepenultimate syllables of certain word-forms: *suþerne* replaced *sūþerne*, and *ērende* gave way to *erende*, for example.

The four laws are represented by the following rules.

(3) OSL:

$$V \longrightarrow [\text{+long}]/\,\#\,X\left[\begin{array}{c} \overline{\qquad} \\ \text{+STRESS} \\ \text{-HIGH} \end{array}\right]\$\,Y\,\#$$

(4) HOL:

$$V \longrightarrow [+long]/\#\,X\left[\frac{\quad}{+STRESS}\right]\left\{\begin{matrix}nd/mb/\\ng/ld/\\rd/rð/\\rz/rn/\\rl\end{matrix}\right\}Y\,\#$$

(5) SHOCC:

$$V \longrightarrow [-long]/\#\,X\left[\frac{\quad}{+STRESS}\right]CCY\,\#$$

(6) TRISH:

$$V \longrightarrow [-long]/\#\,X\left[\frac{\quad}{+STRESS}\right]Y\,\sigma\sigma\,\#$$

In the Neogrammarian fashion, it was assumed that these rules represented sound laws and applied without exceptions. However, especially as far as the lengthenings are concerned, this assumption had to face the fact that the effects of the sound changes seemed to have been obscured to a very high degree, so that Modern English reflects them only very rudimentarily.

Take OSL, for example. First of all, there is the problem of high vowels. It is well known to students of English historical linguistics, so only a brief reminder of the facts will be given here: while it is generally conceded that high vowels were also affected by the lengthening, there are so few words that show its effects (e.g.: ModE *evil*), that the matter is often left out of discussions of OSL altogether or given separate treatment. Quite apart from the high vowels, however, Modern English reflections of the change are altogether so infrequent, that linguists have come to suspect that the standard version might be incorrect and have tried to offer better versions of the sound law.

The first to succeed in that was Donka Minkova (1982). In a study which focussed on the Modern English reflexes of OSL (which are arguably the best evidence there is of the change), she showed that the loss of a final syllable (most often schwa) seems to have been a necessary additional requirement for the lengthening to take place. Of more than 400 potential inputs to the change only those items which are monosyllabic in Modern English really do reflect OSL in most cases (more than 90%). Items that have retained an unstressed final syllable, however, reflect lengthening in only roughly 20%. Minkova's version of OSL, then, was

(7)

$$V \longrightarrow [+long]/\#\,X\left[\begin{matrix}\frac{\quad}{+STRESS}\\ -HIGH\end{matrix}\right]\$\;Ye\,\#$$

where the *e* stands for the deletable schwa of unstressed final syllables.

Essentially, her impressive re-evaluation of OSL rested on the hypothesis that vowels which are not long in Modern English were probably not affected by the change. This is of course in sharp contrast with the Neogrammarian view that exceptions to sound laws were mostly due to such factors as dialect mixture or analogical levelling, while the laws themselves were first applied without any exceptions. There can be no doubt, however, that Minkova's hypothesis has to be preferred over the Neogrammarian one. This can be justified on the grounds that it is simpler and involves fewer assumptions than the Neogrammarian theory, while neither of the two can be verified empirically.[1]

Minkova's law had a crucial drawback, however. Although, it was almost waterproof as a description of lengthening of non-high vowels in stressed open syllables of words that were becoming monosyllabic (applying in more than 90% of all cases, the exceptions being potentially explicable on independent grounds), it failed to express the relatedness of those lengthenings to the same processes in words that remained disyllabic (not to speak of the occasional lengthenings in high-vowels).

However, there turned out to be only one way of expressing these relations without having to sacrifice the descriptive power of Minkova's rule: the reinterpretation of OSL as a process that was sensitive to various factors and was implemented to various degrees depending on the interplay of those factors in individual items, or, in other words, the description of OSL in terms of a statistical law.

The plausibility of this approach was then corroborated by a more detailed statistical analysis of the Modern English reflexes of OSL. The results of this investigation are published in Ritt 1989, so I will only give a summary statement here:

(8)

The probability of Middle English vowel lengthening turned out to be proportional to

a. (the degree of) its stress
b. its backness
c. coda sonority

and inversely proportional to

a. its height
b. coda weight
c. the weight of the weak syllables within the same foot

These regularities can also be expressed by a rule such as

[1] Further arguments are in Ritt 1990.

(9)

$$p(N \rightarrow long) \approx k \frac{a\, s_{\sigma}\, d\, son_{c}\, e\, b_{N}}{x\, w(\sigma_{s})\, y\, w(\{\sigma_{w1}, \sigma_{w2}, \ldots \sigma_{wn}\})\, z\, h_{N}}$$

in which

a, **d**, **e**, **x**, **y** and **z** are constants; their values are unknown and must be provided either by the theoretical framework and/or by induction.
p is short for probability.
N is short for syllable nuclens.
s_{σ} is short for the STRESS on the syllable in question.
son_{c} stands for coda sonority.
$w(\sigma_{s})$ stands for the weight of the strong syllable
$w(\{\sigma_{w1}, \sigma_{w2}, \ldots \sigma_{wh}\})$ stands for the combined weight of all weak syllables in the foot.
h_{N} and b_{N} stand for the height and the backness of the nuclens.

Until the values of the constants in the above formula are known, it will still have to be complemented by statements such as "The probability of vowel lengthening to occur is greater than 90% if the vowel is stressed and non-high, the coda weighs 1/2 mora (see below) and the weight of the weak syllables in the foot is zero". Eventually, however, this statement should be contained in the formula itself. Of course, what is crucial about it is that it replaces Minkova's version of OSL fully and expresses its relation to those lengthenings which applied with a lower probability as well.

The descriptive value of the above statement turned out to be even greater when tested against the other quantity changes by which Early Middle English vowels were affected. That is, all of the four quantity changes by which Early Middle English vowels were supposedly affected are covered by statement (8). While this is not surprising with the shortenings, whose traditional descriptions show that they can be accommodated in statement (8) on the simple assumption that what favours lengthening disfavours shortening and vice versa (cf. also Ritt, 1988 and 1990), the application of (8) to HOL deserves a few comments. First, it has turned out that Modern English reflexes of HOL reflect a similar sensitivity to the absence vs. presence of final unstressed syllables. Thus, there is only one disyllabic Modern English item, which unambiguously

reflects HOL, namely *groundsel*, and this may be due to the impact of *ground*. More importantly, however, it is possible to show that HOL is not really at odds with the statement that the probability of vowel lengthening was inversely proportional to coda weight, although this might appear to be the case at first sight. Let me prove the point.

The traditional view is that the syllables in which Open Syllable Lengthening ended immediately after the nucleus, that is to say they were unchecked, while homorganic clusters were ambisyllabic, their first element closing the syllable to their left, the second one opening that to their right

(10)

ma	$	ken	vs.	bin	$ dan
re	$	sten	vs.	sin	$ gan
bo	$	dig	vs.	clim	$ ban
			etc.		

This distinction is not really justified, however. First of all, there is no evidence that stressed syllables were coda minimal in Early Middle English. Rather, phonetic evidence from Modern English, such as the unaspirated pronunciation of the intersyllabic stops in words such as

(11)

happy, accolade, beaker, goiter, wacky, attitude

suggest a coda maximal analysis of English stressed syllables. Furthermore, an onset maximal and coda minimal analysis such as the traditional one makes wrong predictions with regard to the implementation of lengthening in words of the type *resten* as opposed to those of the type *maken*. As the data from Minkova's corpus of potential inputs to Open Syllable Lengthening show, the former reflect lengthening in less than 40% of all monosyllabic items, as opposed to words of the *maken* type, which do so in more than 90%.

An analysis by which the different behaviour of the two word types with regard to vowel lengthening can be predicted much more adequately is one which starts from a general maximum syllabication, which renders intermediate consonant clusters ambisyllabic as in

(12)

ma	[k]	en	vs.	bin	[d]	an
re	[st]	en	vs.	sin	[g]	an
bo	[d]	ig	vs.	clim	[b]	an
			etc.			

and which relates the probability of vowel lengthening not to coda structure but to coda weight. On the simple assumption that ambisyllabic elements weigh half, the codas of words of the ma[k]en type would weigh $^{1}/_{2}$ mora,

while those of the *resten* type would weigh 1 mora. Thus, one can say that the probability of vowel lengthening is inversely proportional to coda weight, and this statement is indeed much more adequate with regard to Modern English evidence than the traditional description.

This type of analysis, then, makes the distinction between Homorganic Lengthening and Open Syllable Lengthening irrelevant, because the metrical weight of Homorganic clusters can be assumed to be less than that of other clusters of two consonants. As Herbert 1986 has stressed in a detailed study of prenasalization, the articulation of nasal-plus-stop clusters tends to consume hardly more time than that of single consonants. The reason for this is probably that nasals – and liquids for that matter – can be articulated in passing, so to speak, when they occur between vowels and voiced homorganic obstruents, because they share most of their articulatory features with either of their two immediate neighbours. One can assume that codas which consist of homorganic clusters do not weigh more than codas which consist of single consonants. Therefore, if the open syllable criterion is replaced with the parameter of coda weight – as we have shown to be justified on independent grounds, the distinction between Homorganic Lengthenings and Open Syllable Lengthenings turns out to be spurious, and all lengthenings can be covered by the statement that the probability of Early Middle English vowels depended on coda weight. (QED. For further details regarding the relation between HOL and statement (8) see Ritt 1986 and 1990.)

Having thus asserted the descriptive superiority of a statistical statement over a law of the Neogrammarian type with regard to Early Middle English changes of vowel quantity, let us return to the role which universal tendencies might play with regard to the description and explanation of individual sound changes. Have another look at the statement made in (8). Apart from making adequate predictions with regard to the reflexes of Early Middle English quantity changes in Modern English, they can each be related to a hardware constraint on human articulation and/or perception. Thus, they follow from the general principle that phonology serves to facilitate articulation and perception. More specifically, however, they can be regarded as straightforward reflections of universal phonological process types serving this purpose.

In the following sections the respective hardware constraints will be briefly discussed.

1. Both the influence of syllable weight and that of the overall weight of the weak syllables of a foot can be explained as consequences of the principle of isochrony, i.e. the tendency of "*stressed* syllables [to] occur at regular intervals" (Couper-Kuhlen 1986:53). This principle is easy to understand.

Let us assume that the time between two prominence peaks tended to be as constant in Early English utterances as in Modern English, regardless of the number of syllables or segments that had to be accommodated between those

peaks. Since stress peaks (that is to say the peaks of measurable intensity) are actually located at the transition between the onset and the nucleus of stressed syllables, nuclei of stressed syllables are therefore not stress peaks themselves, but are, phonetically speaking at least, between two such peaks. If the time interval between such stress peaks is constant, it follows that the speed with which elements between peaks are pronounced will be proportional to the number of those elements, and this included the nuclei of the peak syllables. On the other hand, the time attributed to the pronunciation of each element between stress peaks will be inversely proportional to the number of these elements. The more elements there are between the stress peak of a word and the next #, the more elements there will be between this stress peak and the next (other things being equal, of course). There are two consequences which follow from this fact: first, stressed nuclei (of footheads) will tend to be pronounced more rapidly (and therefore be pronounced shorter, and be shortened by a shortening process) in words with a greater number of weak syllables than in words with a smaller number of weak syllables (where they will be pronounced longer and tend to be lengthened by lengthening processes), and second, the nuclei of footheads will tend to be pronounced more rapidly (and therefore be pronounced shorter, and be shortened by a shortening process) in words with longer rhymes than in words with shorter rhymes (where they will tend to be pronounced longer and tend to be lengthened by lengthening processes) (cf. Dressler 1985: 44).

2. It is an acknowledged fact that low vowels lengthen more easily than high vowels, while high vowels shorten more easily than long vowels. At least two explanations can be proposed for this:

First it can be pointed to the fact that low vowels are more sonorous than high vowels: their greater sonority makes them louder and more easily perceived, and this relative loudness might be mistaken for length by language acquirers. This would explain why low vowels are more easily reinterpreted as long vowels than high ones.

Second, it is generally acknowledged that vowels differ from each other with regard to what has been called their 'internal duration'. In particular, the pronunciation of low vowels tends to last longer than the articulation of high vowels which are otherwise the same. Lehiste (1970) has argued that this is due to the fact that the articulation of low vowels involves jaw lowering and therefore takes longer than the articulation of high vowels, for which the jaw does not have to be removed as far from its resting position. Although Catford (1977) contends that this is really the reason for the differences in 'internal vowel duration', we may claim that – whatever motivates the phenomenon – it also provides a good explanation for the way in which vowel height seems to have constrained the implementation of vowel quantity changes in Early Middle English.

3. The influence of backness on vowel quantity is not as obvious as that of the other factors; in Middle English its influence can be observed only among mid vowels, so that this parameter seems to be the weakest part of statement 8). It might even be assumed that the differences between the implementations of /o/-lengthening and /e/-lengthening were just side effects of the influence of vowel height, since English /o/-allophones seem to have tended towards lowness, while /e/-allophones appear to have tended towards highness.[2] However, given the assumption that the back-front opposition does play an independent role with regard to vowel quantity, one has to see whether an explanation can be found for this. – And, at least as far as the influence of backness on the quantity of vowels of middle height (viz. /o/ and /e/ phonemes) is concerned, this seems to be possible on acoustic/auditory grounds. As Fry (1979: cf. 127) states, the relative intensity (=loudness) of /o/ (28db) is much greater than that of /e/ (23db). From this it follows that /o/ allophones will tend to be perceived as relatively more prominent than /e/ allophones, and will therefore be more easily reinterpreted as long.

4. It seems to be a linguistic universal that the duration of vowels depends on the sonority of the subsequent consonants. The effects of this tendency can be observed quite clearly in Modern English, but it also seems to hold[3] – albeit not quite as obviously – for German (cf. Meyer 1903), Spanish (cf. Zimmermann/Sapon 1985), Norwegian (cf. Fintoft 1961), French, Russian or Korean (for all there cf. Chen 1970), to name just a few languages that have been investigated in this respect.

As far as the phonetic background of the phenomenon is concerned, Hubmayer (1986) provides a summary of potential explanations unfortunately, most phonetic investigations have restricted themselves to the voiced-voiceless opposition, and, as will become obvious, the results of these studies cannot always be generalized to serve as explanations for the influence of sonority in general).

Studies of articulatory processes have shown that in the transition between a vowel and a voiceless obstruent the closure can be achieved more rapidly than in the transition between a vowel and a voiced obstruent, which might be due to the fact that

> The necessary wide separation of the vocal cords [needed for voiceless consonants] can be achieved more rapidly than the more finely adjusted smaller separation of a voiced consonant.
>
> (Halle/Stevens 1967, as quoted in Mohr 1971: 81)

Alternatively, it has been shown (cf. Javkin 1978: 90-114) that listeners perceive vowels to last longer before voiced consonants than before voiceless consonant,

[2] This is reflected, for instance, in the asymmetricality of the Great Vowel Shift or in the articulatory positions of ModE /e/ vs. short /ɒ/.

[3] The following references are taken from Hubmayer (1986:224).

which, Javkin argues, may be due to "the continuation of voicing into the consonant" (1978: 103).

Although we are in no position to check the relative plausibility of the two explanations, the parameters investigated by Javkin are more similar to the ones with which we have been operating in this study, while it is not certain that the approach taken by Halle/Stevens (1967) can be generalized to explain the influence of different degrees of coda sonority on nucleus length.

Thus, all parameters that seem to have governed Early Middle English quantity changes can be explained articulatorily and/or perceptively. Since they must be assumed to exert their influence whenever human beings communicate with each other with their mouths and ears, it is no bold assumption to think that they should have quasi-universal status.

Our description of Early Middle English changes of vowel quantity, which we have gained on purely empirical grounds, can therefore be regarded as a faithful implementation of universal principles. As a matter of fact, we might have arrived at exactly the same results had we started from the universal principles themselves and proceeded by deduction. For the changes in question, the relevance of universal tendency statements must therefore be regarded as being beyond any doubt. No non-statistical, particularist account could reach either its descriptive adequacy or its explanatory potential.

This brings us the the other problem raised at the beginning of this paper: having acknowledged that universal principles seem to have been behind Early Middle English changes of vowel quantity, we still do not know why the effects those principles had in Early Middle English were so much stronger than the effects the same principles have had in other languages and/or at other times.

As Dressler (cf. 1985:260ff.) has pointed out, a potential answer to that question might be provided by the principle of goal conflict. Speech sounds are not only subject to laws relating to their pronunciability and/or receptibility, but also to others, in which they figure, for example, as distinguishers of meaning and as the building blocks of which morphemes consist. In this respect, of course, they may easily be subject to regularities that counteract phonetico-phonological tendencies.

This means that the statements made in (8) would have to incorporate information about morphological factors as well as about possible other ones that might either increase or decrease the probability of their application.

Here, we shall only be dealing with morphological matters.

As Kastovsky (1988, 1989 and forthcoming (a), (b)) has pointed out, the morphology of Late Old or Early Middle English can be characterized as representing the final stage in a metamorphosis that had probably already started in Old English: originally, both nominal and verbal inflection and derivation had been stem-based: most (if not all) word-forms occurring in actual texts would consist of a stem plus an inflectional ending, while stems

(which consisted of a root plus a stem formative) were not to appear as actual word-forms in actual texts. Thus, in Early Old English, the relation between the NA Sg. cf *cyme* 'coming' and the stem *kum-* was probably not as transparent anymore as it had been before, that is in Germanic times. There, it can be assumed that the rules applying to an underlying representation such as

(13)

kum	+ i	+	–
ROOT	STEM FORMATIVE		CASE/NO

were purely phonological. The /u/ of the stem would have been i-umlauted to /y/, while the stem formative /i/ might have been optionally reduced to a central vowel, but was probably still recoverable.

In this type of system, the representations of the underlying stems would have differed considerably from the actual shapes they would assume in actual word-forms, because the latter depended on the suffixes that were attached to them and were derived by a set of relatively straightforward phonological rules. The advantage of this of system was that the relatedness of *cyme* 'coming' to related words such as the verb *cuman* 'to come' was still recoverable via the common underlying root morpheme *kum*. Its greatest disadvantage, on the other hand, was that surface word-forms were formally very different from the underlying morphemes from which they were derived.

At the end of the Old English period, however, the morphonological system of English had undergone a radical transformation. The morphologization of such phonological rules as /i/-Umlaut and the reduction and eventual loss of unstressed vowels had brought about a situation in which *cyme* was analysed as shown in representation

(14)

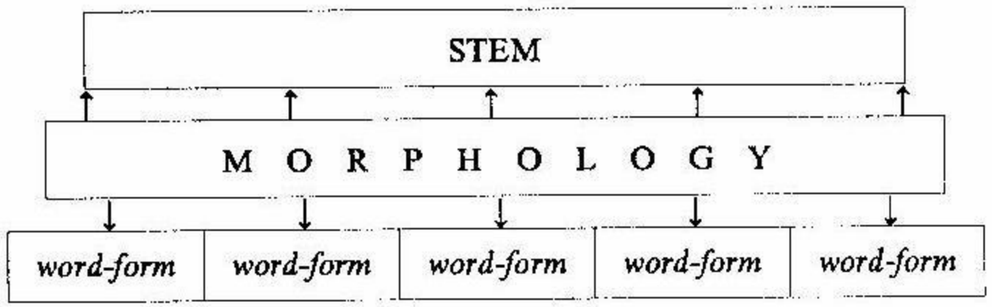
kyme	+	–
STEM		CASE/NO,

As Kastovsky states, this type of analysis was probably fully generalized by the end of the Old English period. At this stage, the relation between related words such as *cyme* and *cuman* was of course less transparent than before. On the other hand, underlying stems and certain surface word-forms (such as the NA Sg *cyme*) had come to be nearly isomorphous (unless one assumes a zero allomorph to mark the NA Sg of *cyme*.). That is to say, stems could actually figure as surface word-forms themselves. They no longer needed the support of additional morphemes but were able to surface with no other than phonological rules applying on them. Such surfacing stems first appeared in the nominal system, but they were the rule rather than the exception in the verbal system as well at the end of the Old English period (although infinitives were still largely marked).

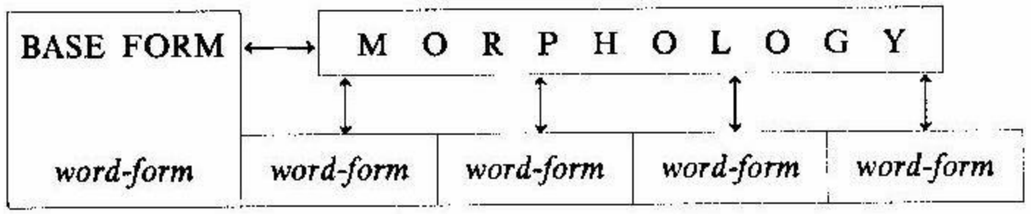
As indicated above, one of the greatest differences between a morphology that is based on abstract stems and one that operates with surfacing base-forms, is that the former is characterized by morphonological alternations to a much greater degree than the latter. Furthermore, in a stem-based system the lexical representation of a stem can never directly enter the (post-lexical) phonological component without the prior applications of morphological operations. This means that for every word-form the derivational distance between the lexical representations of its components and the inputs to post-lexical phonological processes will be equal (see fig. 15/a). In a morphology that is built around surfacing base forms, on the other hand, this is not the case, There, one word-forms is *per definition* more basic than all others: while the latter are derived from it, the base-form itself can by-pass morphology, so to speak, and can enter the phonological component straight from the lexicon. (see fig. 15/b).

(15)

a.



b.



Therefore, in such a system, the difference between the lexical and the surface representations of that base-form will tend to be minimalized for reasons of sign efficiency (ideally, they will be separated only by phonetic realization rules, cf. Dressler 1982: 104ff.). Thus, in a morphology that is built around surfacing base forms the number of phonological rules that apply to base forms will be relatively small, while in a morphology that is based on stems, underyling phonological representations may be rather abstract, while a relatively large set of phonological rules will guarantee that the relatedness of all word-forms based on a common stem remains transparent.

If a morphology changes from a stem system to a base-form system, we must therefore expect radial changes in the phonology as well. Most importantly, they will involve the loss of phonological rules and the re-interpretation of surface forms as underlying targets rather than as the outputs of rules that have ceased to be transparent anyway and that have lost their morphological relevance as well. This, of course, is exactly what seems to have happened in the case of Early Middle English changes of vowel quantity.
Let me deal with this in greater detail.

First of all, it should be emphasized that probably none of the changes by which Early Middle English vowel quantity was affected was ever really implemented into English as a phonological rule of any generality. This is to say, there was probably no stage of the language in which rules of the type

(16)

$$V \rightarrow [\text{-long}]/\_\_CC$$
$$V \rightarrow [\text{-long}]/\_\_\sigma\sigma$$
or
$$V \rightarrow [+\text{long}]/\_\_\$$

would have yielded correct results for every part of the lexicon.

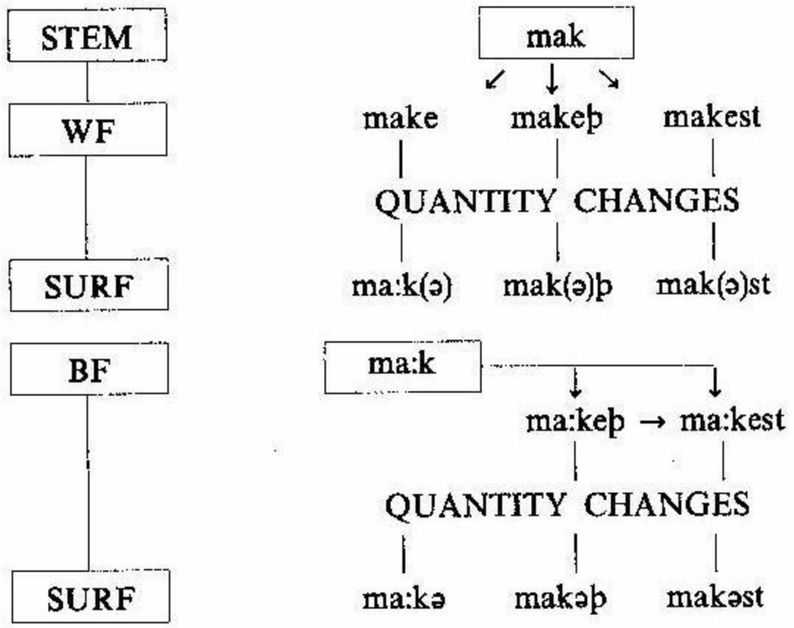
What seems to have happened in the case of Early Middle English changes of vowel quantity, is that the outputs of optional low-level processes affecting phonetic realization were reinterpreted as underlying targets. As Dressler (1982) has shown, such developments are not uncommon and seem to be the typical way in which foregrounding processes such as lengthening tend to denaturalize. In order to obtain a more concrete picture of what is likely to have happened, take the example of EME *maken*. The forms that are attested in *The owl and the nightingale*, for example, are

(17)

1544:	ðah heo hine	*makie*	kukeweld
354:	7 ouerfulle	*makeþ*	wlatie
638:	þat node	*make*	old wif urne
650:	an after þan we	*makeþ*	ure
1390:	for flesches lustes hi	*makeþ*	slide
1444:	þat of so wilde	*makeþ*	tome
1648:	an summe of the schawles	*makeþ*	
339:	7	*makest*	þine song so unwurþ

Given that the rules in (8) governed synchronic socio-stylistic phonological variation in Early Middle English, we may assume that if they operated on the above word-forms, a long vowel will have been pronounced most often in realizations of *makie* (the <i> spelling being ignored), less often in *makeþ*, and least often in *makest*. Generally speaking, we may therefore assume that there will have been a more or less systematic variation between [ma:k] pronunciations and [mak] pronunciations. The underlying representation of all surface forms will probably have been /mak/ and the long vowel in forms such as [ma:kə] will have been derived by an optional rule of allophonic variation, producing, in this case, the extrinsic allophone [a:]. As has been argued above, however, /make/, which was most often realized as [ma:k(ə)], came to be reinterpreted as the base form of the paradigm, so that all other forms such as *make+st* and *make+þ* were derived from that base-from. Since the base form had priority over all other tauto-paradigmatic word-forms, the principle of sign efficiency required that the differences between its phonetic realization and its lexical representation be minimalized, even if this would increase the differences between the underlying representations and surface realizations of other word-forms. So, instead of deriving the [a:] in the realizations of the base form from an underlying /a/, the [a:]s were taken to be realizations of underlying /a:/s, and the shorter pronunciations of the vowels in *make+st* and *make+þ* would then be reinterpreted as optional phonetic shortenings along the lines of (8). A schematic representation of the states before and after the re-interpretation is given in fig. (18) (where all other sound changes, such as the re-interpretation of optional schwa loss as optional schwa insertion, are disregarded.)

(18)



Since the transformation of English morphology from a stem-based to a base-form-based system was more or less completed at the beginning of the Middle English period, it is not at all surprising that changes of vowel quantity reflecting universal phonlogical tendencies were implemented through target re-interpretation during exactly the same period.

This example shows that there might indeed be ways of relating universal phonological tendencies to their implementations in individual languges, which would increase their explanatory power greatly. Although my proposals are in many respects hypothetical, I hope to have demonstrated that universal tendencies may indeed prove useful as descriptive and potentially explanatory devices in the study of language change, and that where they have failed so far this is not due to the nature of the approach itself.

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