OPEN SYLLABLE LENGTHENING IN WEST GERMANIC

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Vowels in stressed syllables in the West Germanic languages—e.g. Middle English, Middle Dutch and Middle High German—were lengthened under certain circumstances. There have been two different explanations for this change. The traditional assumption is that a process of open syllable lengthening (OSL) was introduced to standardize the quantity of stressed syllables (Prokosch 1939, among others). The second, quite different, approach assumes that the lengthening process (at least in Middle English) is not OSL but some sort of compensatory lengthening caused by the loss of a final schwa (Minkova 1982, 1985, Lass 1985, Hayes 1989, Kim 1993). We attempt to show that OSL was part of the grammar of all three languages, but that the motivation depended on the local contexts. We claim that all three languages endeavored to maintain and maximize the Germanic foot (Dresher & Lahiri 1991), and OSL contributed in different ways to do so.*

1. OPEN SYLLABLE LENGTHENING: THE PROBLEM. Until recently, it has been a fairly uncontroversial assumption that stressed syllables in all the West Germanic languages underwent a process of open syllable lengthening (OSL) during the thirteenth and fourteenth centuries (Prokosch 1939:140). According to this standard account, OSL lengthens the vowels of short stressed syllables of the form C_0V, changing them to C_0V:. In the last decade, however, this account has been challenged by a number of proposals concerning Middle English (ME)[1] open syllable lengthening (MEOSL) which suggest that, at least in this language, there was no general rule that lengthened vowels in open syllables. This move away from MEOSL as open syllable lengthening was inaugurated by Minkova (1982, 1985).[2] Basing her argument on a list of 326 native and Scandinavian words compiled from the entries in Holthausen (1934) and Sweet (1888), supplemented by 107 words borrowed from Anglo-Norman collected by Bliss (1952/53), Minkova claims that 'MEOSL depends crucially on the type of syllable following the stressed short syllable. The change operates unfailingly *only* in cases when there is syllabic restructuring in Middle English, i.e. when the second syllable of the original form is lost due to final schwa deletion in Middle English', (1982:42,

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[1] We have used the following language abbreviations: WGmc (West Germanic), OE (Old English), OHG (Old High German), ONL (Old Dutch), ME (Middle English), MHG (Middle High German), MNL (Middle Dutch), NE (Modern English), and NL (Modern Dutch).

[2] Minkova (1982: 42–43) cites some earlier antecedents of her position, including Sarrazin 1898, Minkoff (1955), and Erdmann 1972.

emphasis in original). For Minkova, the contrast in 1 reveals the essential context of MEOSL.[3]

(1) MEOSL (Minkova 1982)
   a. tāle 'tale'
   b. tălent 'talent'

OSL applies consistently in cases such as 1a, where the stressed syllable is followed by a schwa; it is the loss of the schwa, she suggests, that causes lengthening of the stressed vowel. If a vowel (or syllable) following an initial light syllable is retained, however, as in 1b, the stressed vowel does not lengthen, even if in an open syllable.

Minkova's suggestion of apocope leading to vowel lengthening is taken up and modified in a series of publications, including Lass 1985, Minkova 1985, Hayes 1989, and Kim 1993. While offering slightly different formulations of MEOSL as well as providing different explanations for what might have motivated it, all these accounts continue to take the view that the behavior of the following vowel is part of the conditioning environment for OSL. We will discuss these theories in more detail in §7.

In this article we will take issue with the basic empirical assumption shared by the above studies that MEOSL depends on a following deleted or reduced vowel. We will show instead that the traditional characterization of MEOSL is essentially correct: that is, OSL is, as the name suggests, open syllable lengthening. We will argue that this version of the facts allows us to better realize an idea proposed in some of the studies cited above: that the introduction of MEOSL has something to do with maintaining or restoring a preferred prosodic structure. We will propose a new explanation for how OSL interacts with other aspects of Middle English prosodic structure to achieve this result.

In demonstrating the truth of these claims, we will proceed in a manner somewhat different from the studies reviewed above, and, indeed, from most previous studies we know of.

First, we will adopt a comparative perspective, looking at a number of closely related languages. We will argue that essentially the same rule of OSL was introduced into the grammars of all the West Germanic languages; we will look at Middle English, Middle Dutch, and Middle High German as representative examples.[4]

Second, rather than focusing only on OSL, we will take a systemic view of each

[3] A brief note about transcription practice. In the older Germanic languages the long vowels are marked with a macron. When necessary to emphasize the contrast, we use a breve to indicate a short vowel. For words in the modern languages, we have maintained the standard orthography where there is no danger of ambiguity. In Dutch, the orthography is generally transparent with respect to vowel length. Other than in word-final syllables, short vowels are always followed by two consonants. In closed syllables, long vowels are doubled, but vowel length is not marked in open syllables except for the digraphs ⟨ie⟩ [i:] and ⟨oe⟩ [u:] which are always long. German orthographic practices are not as transparent as Dutch. Although short vowels are generally followed by two consonants, vowel length can be ambiguous in final syllables. As in Dutch, the digraph ⟨ie⟩ represents [i:]. Otherwise, long vowels are left unmarked in open syllables, but are often followed by ⟨h⟩ to indicate length. Whenever necessary, for the modern languages we have used phonetic transcriptions within square brackets where long vowels are indicated by a following colon.

[4] We are restricting our discussion to Middle English, Middle Dutch and Middle High German; a future study should include other West Germanic dialects, which we believe also show reflexes of OSL. Yiddish, for example, shows different reflexes for long and short *a*. Original long [a:] is now [o] while earlier [a] remains the same; cf. *vogen* 'wagon', *tog* 'day', as against *vaser* 'water'. Swiss German spoken in the Chur area has long vowels in disyllabic words with open syllables like *Ha:sel* 'hazel', *Tü:fel* 'devil', but not when the medial consonant is a geminate: *Wetter* 'weather', *Wasser* 'water' etc. Other dialects, like Thurgovian, show levelling in some conditions which are beyond the scope of this study.

grammar. A purely comparative-historical approach might lead us to expect that the same rule should apply or fail to apply in the same cognate sets, but we take the view that whether a process applies or not will depend on local conditions in each individual grammar. Similarly, the same process can have quite different effects in different languages. By looking closely at the processes with which OSL interacts in each language, we can explain its varying outcomes, including cases where it appears to fail.

The third point of difference is our approach to the data in each language. Minkova (1982) deserves much credit for placing discussions of MEOSL on a more solid empirical base by presenting an explicit list of relevant words. We believe, however, that an even better understanding of the facts can be achieved by looking systematically at word classes. Declensional and inflectional paradigms play a crucial part in our account. Counting how many Old English words have New English reflexes with short or long vowels can lead to misleading conclusions about what went on in Middle English if one does not take into account the paradigmatic classes that obtained at the time OSL was active. We will show that each paradigmatic class behaves differently when exposed to OSL, because of the differential effects of other processes and paradigmatic levelling.

2. OSL IN DUTCH. Vowel length is contrastive in open syllables in Old Dutch. These length contrasts were to a large extent neutralized in Middle Dutch when, according to traditional accounts, short vowels in open syllables were lengthened. Because of OSL, no short vowel could stand before a single consonant intervocalically; this change did not take place in closed syllables, such as before geminates (van Bree 1977:289).[5]

If this process is indeed open syllable lengthening, then one might expect all short vowels in open syllables to lengthen regardless of the number of following syllables. If, though, this process is similar to what has been claimed for Middle English, viz. some form of compensatory lengthening, then the lengthening should occur only in words where the final syllable was dropped.

2.1. OSL IN DUTCH NOMINAL PARADIGMS. Classes of nominative singular and plural nouns from an early stage of Middle Dutch are shown in Table 1.[6] The first set of

				PREDICTED	
	ENDINGS	SINGULAR	PLURAL	OSL	GLOSS
(a)	Ø - Ø	wapen	wapen	L - L	'weapon'
(b)	Ø - V	dach	daghe	S - L	'day'
(c)	V - V	tale	tale	L - L	'tale'
		weduwe	weduwe	L - L	'widow'

TABLE 1. Predicted OSL in Middle Dutch.

candidates for OSL would be heterosyllabic stems where the first syllable contains a single vowel like *wapen*, in a, or *weduwe*, in c. Whether the words have an ending or not would be irrelevant, and both forms would be expected to show lengthened vowels

[5] According to van Bree (1977:289), 'korte vocalen kunnen wel staan voor geminaten maar niet voor enkele consonanten behalve als die in de Auslaut staan, lange vocalen staan wel voor enkele consonanten (alleen vanouds lange voor enkele consonant in de Auslaut) maar niet voor geminaten'. [Short vowels can indeed occur before geminates, but not before single consonants, except when they occur in the Auslaut [word finally], long vowels can occur before single consonants (only originally long vowels before single consonants in the Auslaut [word finally]), but not before geminates.]

[6] The nouns with an *-e* plural ending sometimes also ended in *-en* which was generalized at a later stage (see van Loey 1954, 1969). Words ending in *-el*, *-er*, later tended to have the plural *-s*. Most nouns with a zero plural ending also took on *-en* or *-s* endings. We represent here the earliest stage of Middle Dutch.

after OSL. The second possible set would be the singulars and plurals of CVC stems where both forms have vowel endings, so that the initial vowel would always end up in an open syllable, for example, *tale* in c. Finally, the plurals of CVC stems with a vowel ending would be susceptible, although the singular forms without an ending would be in closed syllables (b), for example, *dach-daghe*. In Table 1, we indicate under OSL whether the stressed vowel would be expected to be lengthened by OSL (L) or not (S).

We would thus expect that not only would some nouns end up with long vowels in both the singular and plural and therefore be reanalyzed eventually as having long vowels (a, c), but there would also be a class of nouns that would show a vowel-length alternation (b). These predictions are entirely borne out. The nouns in a and c in Table 1 lengthen in the singular and in the plural: compare the Middle Dutch words in Table

OLD ENGLISH	MIDDLE DUTCH	DUTCH	ENGLISH
fugel	vōgel	vōgel	fowl
hamor	hāmer	hāmer	hammer
fiðele	vēdele	vēdel	fiddle
nacod	nāket	nākt	naked
fiðere	vēdere	vē(d)er	feather
hunig	hōnich	hōning	honey
widewe	wēduwe	wēduwe	widow
cyning	cōninc	kōning	king

TABLE 2. Multisyllabic stems after OSL.

2 with their Old English counterparts. Because we do not have records of Old Dutch, we are using Old English forms as representative of the older stage of the common West Germanic ancestor of English and Dutch to represent the original vowel length. The modern Dutch words (NL) are also listed, showing that the length has been maintained.

Moreover, after OSL a new class of nouns is created from nouns of type b in Table 1, where the stem vowel is in an open syllable in the plural. This class now has a short vowel in the singular and a long vowel in the plural.[7]

DUTCH		MIDDLE DUTCH	OE COGNATE	GLOSS
bad	ba:den	bat	bæþ	'bath'
dag	da:gen	dach	dæg	'day'
gat	ga:ten	gat	geat	'hole'
glas	gla:zen	glas	glæs	'glass'
hof	ho:ven	hof	hof	'courtyard'

TABLE 3. Exceptional Dutch plurals of Germanic origin descended from *a*-nouns.

These nouns are considered to be the class of nouns with 'exceptional' plurals in modern Dutch. A survey of these nouns from the CELEX database shows that almost all exceptional nouns of Germanic origin belonged to the original short *a*-class nouns. This particular class has singular CVC stems with no ending (therefore keeping the stressed vowel in a closed syllable) and a plural V(C)-ending that makes the initial syllable light and open. We find that 81% of Dutch alternating forms correspond to known Old English *a*-stems. Conversely, out of 31 Old English *a*-nouns in our data for which we found Dutch reflexes, 24 of 31 forms, or 77% of the Dutch cognates of Old English *a*-nouns, have alternating length in Modern Dutch, and 27 of 31 (87%)

[7] The glosses in Table 3 refer to the modern Dutch forms.

DUTCH				
SING.	PLURAL	MIDDLE DUTCH	OE COGNATES	GLOSS
blad	bla:deren	blat	blæd	'leaf'
dak	da:ken	dac	þæc	'roof'
dal	da:len	dal	dæl	'valley'
gebed	gebe:den	ghebet	(ge-)bed	'prayer'
gebod	gebo:den	ghebot	(ge-)bod	'command'
gebrek	gebre:ken	ghebrec	(ge-)brec	'lack'
god	go:den	god	god	'god'
lid	le:den	lit, let	liþ	'limb'
lot	lo:ten	lot	hlot	'fate'
pad	pa:den	pat	pæþ	'path'
schip	sche:pen	scip, scep	scip	'ship'
smid	sme:den	smit, smet	smiþ	'smith'
staf	sta:ven	staf	stæf	'staff'
tred	tre:den	trēde	-tredel	'pace'
vat	va:ten	vat	fæt	'cask'
weg	we:gen	wech	weg	'road'
zwad	zwa:den	swāde	swæþ	'swath'

TABLE 4. Exceptional Dutch plurals of Germanic origin from the CELEX list.

had alternating length in Middle Dutch.[8] In Table 4, we list some further examples of Dutch special plurals and their Old English counterparts.

Thus, it appears that, at least in Dutch, this lengthening is indeed a lengthening of stressed vowels in open syllables, irrespective of the number and type of following syllables.

2.2. LOSS OF FINAL SCHWA IN DUTCH. Let us return to the class of words in Table 1c. In Modern Dutch, these words have the expected stressed long vowel, but no final

OLD ENGLISH	MIDDLE DUTCH	DUTCH	ENGLISH
talu	tale	taal	tale
sunu	sone	zoon	son
lagu	lake	laak	lake
nosu	nose/neuse	neus	nose
haca	hake	haak	hook
nama	name	naam	name

TABLE 5. OSL in Dutch with final vowel deletion.

vowel. Comparing the Old English and Middle Dutch forms in Table 5 with their Modern Dutch counterparts, one might suppose that the lengthening of the stem vowel is connected with the loss of the schwa. As we have seen, however, OSL is entirely general in Dutch. Therefore, we claim that the lengthening in Table 5 is due to the regular process of OSL and has nothing to do with the deletion of the final vowel.

Conversely, the loss of the final vowel has nothing to do with OSL, but is morphologically determined; indeed, *all* final vowels in the nominative singular are deleted, regard-

[8] Here and throughout, word lists and statistics are based on a data base we have been compiling of words in Old English and their cognates and reflexes in English, Dutch, and German. Sources used in compiling the data base include: Bosworth & Toller 1898, Bliss 1952, Braune & Mitzka 1967, van Bree 1977, Brunner 1970, Campbell 1959, CELEX (1995), the ODEE (1994), Etymologisches Wörterbuch des Deutschen (1989), Franck 1971, Holthausen 1934, Jordan 1974, van Loey 1954, 1969, Luick 1914–40, Morsbach 1896, Paul & Mitzka 1959, Pijnenburg & van der Voort van der Kleij 1984, Priebsch & Collinson 1934, Schade 1969, Sievers 1885, de Vries 1971, de Vries & de Tollenaere 1983, van Wijk 1949, and Wright & Wright 1925.

less of OSL.[9] The modern Dutch counterparts of the singulars of all forms in Table 6 have no final vowels, including words whose initial syllable has a long vowel or a geminate consonant.

MIDDLE DUTCH	DUTCH	ENGLISH
bedde	bed	bed
sonne	zon	sun
māne	maan	moon

TABLE 6. Final vowel deletion in Dutch.

The final vowel deletion was probably motivated by an attempt to re-establish the singular/plural distinction in nouns where this distinction was lost when the unstressed vowels were reduced to schwa.[10]

OLD ENGLISH		MIDDLE DUTCH		DUTCH		
SG	PL	SG	PL	SG	PL	GLOSS
nama	naman	nāme	nāme(n)	naam	name(n)	'name'
sonu	sona	sōne	sōne	zoon	zone(n)	'son'

TABLE 7. Singular and plural in Old English, Middle Dutch, and Dutch.

There is one other instance of lengthening where it might appear, at first glance, that a stressed vowel has lengthened as a result of the loss of a syllable.

OLDER GERMANIC	MIDDLE DUTCH	DUTCH	GLOSS
manoth (Old Saxon)		maand	'month'
nacod (OE)	nāket, naect	naakt	'naked'
anut (OHG)		eend	'duck'
magad (OHG)	māghet	maagd	'maiden'
nimis (Goth)	nēm(e)s	neems	'take 2SG'

TABLE 8. OSL and syllable loss in Dutch.

In the forms in Table 8, Modern Dutch shows a single syllable with a long vowel where one of the older Germanic languages has a disyllabic word with an initial light syllable. One could be tempted to think that the reduction to a single syllable led to the lengthening of the first. However, many of the MNL counterparts like *nāket*, *naect* show an alternation between a monosyllabic and disyllabic form, but where in both instances the initial vowel is long. Therefore, the lengthening is in no sense a compensation for the loss of a syllable.

To round out our discussion of OSL in Dutch, we observe that not all diachronic lengthenings of stressed vowels are due to OSL. In Middle Dutch for example there is a process of REKKING which literally means stretching, mostly of /a/ and dialectically of /o/ and /u/, when followed by /r/ and a dental consonant (van Loey 1954:65).

DUTCH	MIDDLE DUTCH	OLD ENGLISH	OLD HIGH GERMAN	GLOSS
paard	peert, paert			'horse'
haard	hert, heert	heord	herd	'hearth'
schaard(e)	scaert, scart	sceard	scart	'nick'
staart	sta(e)rt, ste(e)rt	steort	sterz	'tail'

TABLE 9. Middle Dutch stretching.

[9] To our knowledge, the only exception is the word *weduwe* 'widow'.

[10] The final *-n* in the plural is generally not pronounced in most Dutch dialects. This process began quite early in MNL.

Other examples include *boord* 'collar', *koorts* 'fever', *noord* 'north', *koord* 'cord', and so on. There are also some exceptions like *hard* 'hard', *gard* 'birch switch', *zwart* 'black', and *bars* 'brusk'. Stretching did not happen when a labial or a dorsal consonant followed: thus, *warm* 'warm', *berg* 'mountain', *sterk* 'strong', and so forth. In any event, this lengthening is entirely independent of OSL.

2.3. RELATING OSL IN DUTCH TO EARLY GERMANIC NOMINAL CLASSES. As noted in §2.1, the modern Dutch special plurals with long vowels in the plural and short vowels in the singular have developed from the early Germanic *a*-nouns. One might think that this development is morphological and not phonological, that is, it is possible that only the vowels of the plural of a certain morphological class were lengthened. That this is not the case can be seen if we briefly examine the Germanic nominal classes that were distinguished by stem vowels (vowels that were originally added to the root, e.g., such as *-a*, *-ja*, *-i*, *-u*, and so on).

The nouns in the different classes could be divided into light stems (CVC) and heavy stems (all others). Since nominal inflectional suffixes are invariably vowel initial, the syllable structure of the stems changes with the addition of any ending. Our interest here is only in the syllabic structure of the initial stressed syllable after the singular and plural endings are added. As a representative sample, the different nominal stem classes in Old English are given in Appendix 1. Final unstressed vowels were reduced to schwa in almost all the medieval stages of the different Germanic languages, and Middle Dutch was no exception. As a result, the different classes of stem vowels are no longer distinguishable and the nominal system is reduced to three different classes of endings. The nominal classes in early Middle Dutch, before OSL, are given in Appendix 2. These match the classes in Table 1.

If we look at the Old English forms with respect to OSL, we can immediately see why the special plurals in Dutch conform to the Germanic light *a*-nouns (see also Appendix 3). It is only in this class that the CVC stems do not show any suffix vowel in the singular. In contrast, the Middle Dutch CVC words which show a suffix vowel in the singular and in the plural (Table 1b, Appendix 2 (b)), do not fall into the special plurals category. Instead, as we saw in §2.2, the words have long vowels in both singular and plural. We argued that both singular and plural underwent OSL and the final schwa was dropped in the singular for morphological reasons. If we now compare these words to the Old English forms, we can see that they all correspond to the light CVC stems in the *u*-, *o*-, and *n*- classes (Appendix 1). The final vowels in all these classes became schwa in Middle Dutch, thus neutralizing the stem-vowel distinctions.

As for the heterosyllabic stems, if our account is correct, they could belong to any stem category, and indeed they do—compare the words in Table 2 and Appendix 1. The only constraint for OSL to apply in the heterosyllabic words is that the initial syllable be light. Thus, it is independent of the type of final ending and hence independent of the stem class.

Thus, the syllable structure of the Old English stem types of the nominal system immediately predict where we may or may not expect OSL. We chose Old English as a representative of the older stage of the language when discussing Middle Dutch because it bears a closer resemblance to Dutch within the West Germanic family than Old High German. As we will see, in Old High German, independent phonological changes affected the stem types slightly differently, hence making different predictions. The Old English classes will be especially important when we discuss OSL in Middle English and other theories of lengthening.

2.4. SUMMARY. The consequences of OSL for the Dutch quantity system were quite drastic: if we compare the original quantity of Germanic stems, exemplified in Table 10 by Old English, with their Modern Dutch counterparts, the change is striking.

	Original Syllable							
	VOWEL (L/S)	OPEN/CLOSED (O/C)	OLD ENGLISH		MIDDLE DUTCH		DUTCH	
			SG	PL	SG	PL	SG	PL
a.	S	C-C	sunne	sunnan	sonne	sonnen	zon	zonnen
b.	S	C-O	dæg	dagas	dach	dāghe	dag	da:gen
c.	S	O-O	sunu	suna	sōne	sōne	zo:n	zo:nen
d.	L	C-O	stān	stānas	stēn	stēne	ste:n	ste:nen

TABLE 10. Quantity contrasts in Old English and Dutch.

OSL, followed by final vowel deletion and later by degemination in the singular, had the effect of changing the original quantity contrasts, so that there is no longer any length contrast between the types of words in Table 10c and 10d. Words like Dutch *zoon* and *taal* were restructured as having long vowels in their stems, just like words with original long vowels like *steen*. Where OSL applied only in the plural, modern Dutch has retained a vowel-length alternation in the paradigms of these nouns.

The application of OSL in the history of Dutch is relatively transparent: starting from the pre-MNL morphological classes, we have seen that OSL applies regularly to vowels in stressed open syllables wherever these arose. Conversely, except for stretching, there are few other processes affecting vowel quantity that could interfere with OSL, or obscure its operation. This transparency makes it evident that the lengthening of vowels in open syllables in Middle Dutch is indeed simply that, and is not related to the loss of final vowels or to limiting conditions of any other kind. As we shall see, the situation is not as transparent in other West Germanic languages in which stressed short vowels were lengthened.

3. OSL IN MIDDLE HIGH GERMAN. Other than Middle Dutch, traditional literature claims that late Middle High German (MHG) also underwent a process of open syllable lengthening (cf. Paul & Mitzka 1959:77). Contrary to what we might expect, though, in the present-day variants of Dutch and German the length of vowels for etymologically related words is not always the same, as demonstrated in Table 11, where, as before, L = long vowel, S = short vowel.[11]

GERMAN		DUTCH		ENGLISH	
Name	L	naam	L	name	L
Woche	S	week	L	week	L
Pfad	L	pad	S	path	S
		paden	L		
Wasser	S	water	L	water	S

TABLE 11. Vowel length in German, Dutch, and English.

Since the German pattern appears to be different from Dutch, the question arises as to whether the lengthening operated in the same way. We will show that German under-

[11] The vowels marked S in Modern English may be phonetically long in some dialects of Modern English; this is the case for the vowel of *path* in many British dialects. Our concern is the length of the vowel in Middle English before the vowel shift. A long [a:] at the time of vowel shift becomes [e:], a short one remains low, creating the contrast between words like *saddle* and *cradle*. This is the contrast we are interested in.

went the same process of OSL as Dutch, and that the differences in outcome are due to the participation of other processes interacting with OSL.

3.1. THE SECOND CONSONANT SHIFT AND OSL. One of these processes interacting with OSL is the Old High German (OHG) consonant shift, also known as the second consonant shift (cf. Prokosch 1939:79), which led to the doubling of consonants in certain positions. This consonant shift, which marks a crucial difference between Old High German and the other West Germanic languages, created many more closed syllables than are found in either Dutch or English. Of particular interest here is the change of postvocalic voiceless stops into corresponding geminate fricatives.

OLD ENGLISH	OLD HIGH GERMAN	ENGLISH
water	waʒʒer	water
open	offan	open
wacian	wahhēn, -ōn	wake

TABLE 12. German second consonant shift.

This gemination also occurred after long vowels, but these geminates were often shortened: compare OE *slāpan* with OHG *slāffan*, *slāfan*.

Thus, in polysyllabic words, if an Old English (and presumably, Old Dutch) word has a short vowel in an open syllable with a voiceless stop in the onset of the second syllable, the corresponding Old High German word has a medial geminate fricative that closes the first syllable. If, therefore, OSL was introduced into Middle High German, we should find an asymmetry between Dutch and German in these kinds of words. We would predict that short open syllables with original medial voiceless stops would end up as long in Dutch but short in German, being blocked by the second consonant shift. If the medial consonants were other than voiceless stops (nasals, fricatives, etc.), we

a) Words that undergo the second consonant shift

OLD HIGH GERMAN	OLD ENGLISH	DUTCH		GERMAN		ENGLISH
wehha/wohha	wicu	week	[e:]	Woche	[ɔ]	week
waʒʒer	wæter	water	[a:]	Wasser	[a]	water
offan	open	open	[o:]	offen	[ɔ]	open

b) Words without the second consonant shift

OLD HIGH GERMAN	OLD ENGLISH	DUTCH		GERMAN		ENGLISH
zala	talu	taal	[a:]	Zahl	[a:]	tale
sunu	sunu	zoon	[o:]	Sohn	[o:]	son
namo	nama	naam	[a:]	Name	[a:]	name

TABLE 13. Predictable (non)application of OSL in German.

would expect lengthening in both languages. The examples in Table 13 illustrate the point. Where the second consonant shift has not led to an initial closed syllable, German also shows a long vowel when the original vowel was short and in an open syllable.

3.2. OTHER TYPES OF GEMINATION. Old High German underwent other consonant changes that create closed syllables, and these also prevented OSL. For example, OHG /d/, which became MHG /t/, and /m/ followed by *-er* and *-el*, are often doubled in late Middle High German (cf. Paul & Mitzka 1959: 79, 95), thereby blocking vowel lengthening as in the examples in Table 14.[12] As with the second consonant shift, the effect of this doubling is to create a difference in vowel length between Dutch and German cognate words (Table 15).

[12] The glosses in this section refer to the German words (the Dutch and the Old English glosses have been given in previous examples).

MHG	GERMAN	GLOSS
himel	Himmel	'sky'
weter	Wetter	'weather'
hamer	Hammer	'hammer'

TABLE 14. Other types of gemination blocking OSL.

OLD ENGLISH	DUTCH		GERMAN		GLOSS
weder	weer	L	Wetter	S	'weather'
snide	snee/snede	L	Schnitt	S	'cut'
sidu	zede	L	Sitte	S	'custom'
butere	boter	L	Butter	S	'butter'

TABLE 15. OSL blocked by doubling of MHG /t/.

In the case of /m/ followed by *-el* and *-er*, there was possibly syncope of the medial /e/, leading to a closed syllable. As for /t/, as far as we can tell from existing modern German words, it was doubled regardless of the preceding vowel, thereby shortening original long vowels as well.

OLD ENGLISH	GERMAN	GLOSS
mōdor	Mutter	'mother'
fōdor	Futter	'fodder'
slīdan	schlittern	'slide'

TABLE 16. Shortening of originally long vowels before geminate /t/.

Aside from these cases, originally heterosyllabic words with short open syllables were regularly lengthened in late Middle High German, and this length is evident in Modern German, indicated with L in Table 17.

OLD ENGLISH	OLD HIGH GERMAN	GERMAN		GLOSS
be[o]for	bibar	Biber	L	'beaver'
cyning	kuning	König	L	'king'
ofer	ubir, obar	über	L	'over'
æþele	edili	edel	L	'noble'

TABLE 17. Effects of OSL in German.

3.3. RESTRUCTURING OF ALTERNATING STEMS. One set of differences in the outcome of OSL in Dutch and German is due to the intervention of consonant doubling that occurs in German but not in Dutch. We will now look at another source of difference between the quantity systems of these languages. Recall that Dutch has special plurals, i.e. a singular-plural length alternation in words corresponding to original short stem *a*-nouns (Table 3) where the stem vowel is in a closed syllable in the singular but in an open syllable in the plural. However, in German we find that these stems have no length alternation: where consonant doubling occurs, the stems are, as expected, always short (Table 18);[13] but where doubling does not interfere (Table 19), the stems are long in all forms of the paradigm.

[13] The German words *Spieß* 'skewer' (OE *spitu*, Dutch *spit*) and *Maß* 'measure' (OE (*gi-*)*met*, Dutch *gemet*), seem like exceptions, because the vowel in the Modern German words is long. However, OE *spitu* corresponds to MHG *spiʒ* 'skewer' with the expected short vowel (MNL *spit*/*spet*), and this vowel would have later been blocked from lengthening by consonant gemination. There was, though, another OHG word *spioʒ* 'spear', MHG *spieʒ*, which always had a long vowel. German now has one word *Spieß* with a long vowel, presumably from the latter source. A similar explanation accounts for the long vowel in German *Maß*, which corresponds to two OHG words, *meʒ* 'measure' and *māʒa* 'temperance'. The length of the vowel in the modern word can be attributed to the influence of the latter source. Therefore, these words are not exceptions to the rule that OSL was blocked by MHG consonant gemination.

OLD ENGLISH	DUTCH	GERMAN	GLOSS
fæt	vat	Faß	'cask'
god	god	Gott	'god'
þæc	dak	Dach	'roof'
scip	schip	Schiff	'ship'

TABLE 18. Dutch alternating stems correspond to German short stems.

OLD ENGLISH	DUTCH	GERMAN	GLOSS
(ge-)bed	gebed	Gebet	'prayer'
bæþ	bad	Bad	'bath'
dæg	dag	Tag	'day'
dæl	dal	Tal	'valley'
hof	hof	Hof	'courtyard'
weg	weg	Weg	'path'

TABLE 19. Dutch alternating stems correspond to German long stems.

We can infer that the German stems must have restructured so that they now have long vowels, and that this restructuring must have been based on the plural forms, which had lengthened by OSL. This is unlike Dutch, which maintains the short-long distinction in these paradigms. Note that one cannot argue that *all* original nouns of this class were for some reason lengthened in German, because those that underwent the second consonant shift had a closed syllable in the plural and therefore did not lengthen in the singular either, as shown in Table 18. Clearly, the trigger for the restructuring must have been the plural, where the vowel was lengthened by OSL.

Why was there a systematic restructuring in German in favor of long vowels and not in Dutch? We conjecture that this was due to the fact that, after the second consonant shift and the change of medial [d] to [tt], the remaining single intervocalic consonants were all voiced.[14] Thus, when OSL applied, the vowel-length alternations in the *a*-nouns were typically in the context of voiced sounds. Vowels in general are phonetically longer in the context of such segments; once there is a vowel-length alternation within a paradigm in the context of voiced sounds, it is possible that the phonetic length in the closed syllable in the singular can be interpreted as phonological, given that the plural has a phonologically long vowel.[15]

3.4. SUMMARY. We have established that the lengthening of stressed vowels in Middle Dutch and Middle High German is due to OSL, and not to compensatory lengthening due to the loss of a final vowel. We have also seen that the same rule of OSL can yield different results in the two languages, depending on how it interacts with other processes, and whether quantity contrasts in paradigms are maintained or levelled in each

[14] Reis (1974a, b) also discusses the relationship between West Germanic gemination, the High German consonant shift, and the various shortening and lengthening processes in the history of German. She concludes that in the earliest stages, gemination led to close or loose contact between vowels and consonants ('fester Anschluß' vs. 'loser Anschluß'): short vowels had close contact and long vowels had loose contact with the following consonant. With other consonant changes, close vs. loose contact also became a function of the voicing of the following consonant, so that long vowels became predictable before voiced consonants and short vowels before voiceless consonants. In the thirteenth century, due to independent changes, the quantity of vowels came to be independent of the voicing of the following consonant and became related to stress and tenseness. However, Reis says nothing explicitly about the interaction of open syllable lengthening and voicing.

[15] King (1969:53) states that vowels were lengthened before voiced obstruents in Early Modern German, around 1400. See also Leys 1975 for the same point.

language. In Dutch, the operation of OSL is relatively transparent with respect to the original contexts as exemplified by Old English. In German, the operation of OSL interacts with consonant gemination and paradigm levelling, obscuring the correspondence between the original OSL contexts and the current distribution of long and short vowels.

4. OSL IN MIDDLE ENGLISH (MEOSL). If we assume that Middle English was no different from the other West Germanic languages with respect to OSL, we would expect that lengthening should occur in all open syllables unless there were other interfering factors. English did not have the second consonant shift, but unlike the other two languages, it had a productive process that affected vowel quantity, namely, trisyllabic shortening (TSS) (Wright & Wright 1928:§88).[16] This process was present in late Old English and was evidently still active in Middle English. Once OSL was added to the grammar of Middle English, the initial short syllables of the original disyllabic stems could potentially be lengthened both in the singular and in the plural. However, if TSS had priority over OSL, only the singular forms would show any lengthening. In that case, both stems with original long vowels and those that were lengthened by OSL would maintain vowel length alternations. We would therefore expect the alternations shown in Table 20.[17]

	SG	PL	SG	PL	SG	PL	SG	PL
OE	hǣring	hǣringas	hamor	hamoras	stȳpel	stȳpelas	beofor	beoferas
OSL	—	—	hāmor	hāmores	—	—	bēver	bēveres
TSS	—	hæringes	—	hamores	—	stypeles	—	beveres
EXPEC	hǣring	hærings	hāmor	hamors	stȳpel	stypels	bēver	bevers
NE	herring	herrings	hammer	hammers	steeple	steeple	beaver	beavers

TABLE 20. Effects of OSL and TSS.

Notice that the resulting surface alternations obscure the original underlying differences between long and short vowels. If this pattern had been retained, we should find alternations in all heterosyllabic stems of this type in Modern English. But there are no such alternations at all, indicating clearly that there must have been some sort of levelling of quantity distinctions within paradigms. In the following sections we will

[16] The existence of TSS as a rule of late Old English has been questioned by Minkova & Stockwell 1998; see also Bermúdez-Otero 1998. They argue that (1) there are a very small number of examples like *sūðerne* > *southern* where TSS can be claimed to have applied to uninflected forms; and (2) Latinate pairs like *sane* ~ *sanity* were borrowed into English separately with long and short vowels, respectively; thus, a form [sænɪtɪ] never existed in English, and was not the historical ancestor of [sænɪtɪ]. These arguments are not compelling. It may be true that there were few uninflected trisyllabic words in Old English that TSS could have applied to, but it does not follow from this fact that TSS did not exist. Moreover, there were very many inflected forms that could have undergone the rule. Furthermore, although we agree that sane and sanity were borrowed into the language separately (Lahiri & Fikkert 1999), what is important is the fact that borrowed trisyllabic forms like *sanity* have short vowels. This shows that TSS was active in the language. In the recent *Cambridge History of the English Language*, Lass (1992:73) mentions the process as part of Middle English and appears to connect it with the Romance loans: 'Long vowels were shortened in antepenults before a single consonant, . . .: *sūþ* 'south' - *sŭþerne* 'southern', *divīn* 'divine'-*divĭnitie* 'divinity' and the like. The alternation pattern produced by this change, and as above enhanced by later changes, is now an important part of English morphophonology'. A detailed discussion of the implications of TSS is provided in Lahiri & Fikkert 1999.

[17] The derivations suggest that OSL was added after TSS and later reordered. It could also be the case that TSS blocked the application of OSL. We have no clear evidence of the ordering except for the fact that TSS clearly took priority over OSL. Otherwise, the original long vowel stems as well as the short vowel stems would not maintain vowel-length alternations. See also Lieber 1979 for a discussion on the ordering.

show (a) that the levelling went both ways and (b) that both original long vowels as well as those lengthened by OSL were equally affected. We will argue that these results are entirely consistent with our analysis, but quite unexpected and difficult to explain in an account that views OSL as a form of compensatory lengthening.

4.1. MEOSL AND TRISYLLABIC SHORTENING. The main Old English nominal classes that would have been affected by OSL and TSS are shown in Table 21.

		OLD ENGLISH		PREDICTED	
	ENDINGS	SG	PL	OSL/TSS	GLOSS
(a)	V - V	talu	tala	L - L	'tale'
(b)	Ø - V	hwæl	hwalas	S - L	'whale'
(c)	Ø - V	beofor	beoferas	L - S	'beaver'
(d)	Ø - V	hæring	hæringas	L - S	'herring'

TABLE 21. Predicted effects of OSL and TSS on Old English noun classes.

The most straightforward class consists of nouns with CVC stems with a vocalic ending in both the singular and the plural, shown in a. All forms of the paradigm would have been subject to OSL, without interference from TSS or any other process. OE *talu* (sg.)-*tala* (pl.) would become *tālə-tāləs* in Middle English. Since all forms of the paradigm would emerge in Middle English with a long vowel, we would expect that this class of nouns would eventually be restructured to have an underlying long vowel, once vowel length again became unpredictable.

This is indeed the case, with some exceptions. The Old English nouns classes which had vocalic endings[18] both in the singular and in the plural, and where the stem was

a. STEM VOWEL /a/: apa 'ape', blæse 'blaze', bracu 'brake', nama 'name', snaca 'snake', spada 'spade', staca 'stake', stalu 'stale', talu 'tale'
b. STEM VOWEL /e/: bedu 'bead', peru 'pear', cwene 'queen', slege 'slay', smeoru 'smear', spere 'spear', stæpe, stepe 'step', tere, teoru 'tar'
c. STEM VOWEL /o/: cloca 'cloak', fola 'foal', nosu 'nose', smoca 'smoke', stole 'stole', stofu, -a 'stove', sopa 'sup', þrote, -u 'throat'

TABLE 22. Old English words with disyllables throughout the paradigm.

CVC are the *i*-, *u*-, *n*- and *ō*- nouns (see Appendix 1). Table 22 gives examples of words that are disyllabic throughout the paradigm in Old English. The words are sorted by the vowels of their stems and belong to one of the above four noun classes. We omit words with high vowels in the stem, which were not regularly subject to OSL.

Most of these words have long vowels in Modern English. Of the ones that do not, *shadow* derives from ME *schadwe*, where the *w* either created a consonant cluster or a disyllable which would have trisyllabic inflected forms; *shade* is the expected outcome from the CVC + V interpretation of the Old English form, via ME *schade*. Final OE *-u* is often ambiguous between representing the vowel *-u*, as in *-u-* and *-o*-declensions, and a *-w*, which appears to prevent lengthening, as in *nephew*. Some other words with short vowels have doublets with long vowels, like *hook*, *hake*; *swath*, *swathe*; *hedge*, *hay*; *stead*, *steed*; *stell*, *steal*. Some of the words with short vowels in the modern language may descend from *a*-nouns, or nouns that changed to the *a*-declension.[19]

[18] The nominative singular does not have an ending. However, in some cases the stem vowel surfaces as a vowel at the end of the stem (Dresher 1980, Lahiri 1982). See also Appendix 4.

[19] For example, we find doublets such as OE *hol* and *hola*, both meaning 'hole'. The former is an *a*-noun and the latter is a weak noun. Though we expect a long vowel from *hola*, *hol* belongs to the class that would have had alternating vowel length, which we have seen results in both long and short vowels in Modern English.

OE STEM VOWEL	OE VOWEL LENGTH	EXPECTED ME LENGTH	NE SHORT #	NE SHORT %	NE LONG #	NE LONG %
/a/	Short	L - L	3	6.5%	43	93.5%
/e/	Short	L - L	9	33.3%	18	66.7%
/o/	Short	L - L	3	12.5%	21	87.5%

TABLE 23. Outcomes in classes with no length alternation in Middle English.

Counting every outcome in Table 22, we arrive at the figures in Table 23. Considering the various extraneous factors that could account for the few short vowels that we find here, the results support the expectation that the modern descendants of these nouns have long vowels.

The nouns in row b of Table 21 are the old monosyllabic *a*-nouns, which have a closed syllable in the singular and an open syllable in the plural (see Appendix 1). Recall that in Dutch these nouns still show a vowel-length alternation and that German chose to restructure the stem to a long vowel. English clearly has no length alternation in nominal paradigms.[20] But if OSL did apply in the plural and then there was levelling because there was an alternation in length, we should expect that some of these nouns would restructure as long and some as short. Again, if we systematically look at this noun class, we find that these nouns have levelled in both directions (we again exclude nouns with high stem vowels). Our collection of *a*-nouns, given in Table 24, contains 19 nouns that have a short vowel in Modern English and 17 that have a long vowel, for a proportion of 53% short to 47% long.

a. SHORT IN NE: back, bath, black, brass, broth, chaff, glass, god, grass, lock, lot, path, sap, shot, staff, swath, thatch, vat, wer[wolf]
b. LONG IN NE: bead, blade, coal, crate, dale, day, door, fare, gate, grave, hole, hope 'recess', meet, sole 'mud', way, whale, yoke

TABLE 24. Old English monosyllabic *a*-stems with short vowels.

Row c in Table 21 represents Old English disyllabic nouns with short stressed vowels in open syllables (all nominal classes—see Appendix 1). Such nouns are disyllabic in uninflected forms, and trisyllabic when an inflectional suffix is added. According to our hypothesis, the disyllabic forms would have been lengthened by OSL, but the trisyllabic forms would have been subject to the overriding effects of TSS. Assuming that the hypothesized length alternation was subsequently levelled, as it was in the *a*-nouns, we would expect the levelling to again go in both directions. The descendants of these nouns are indeed found as both long and short in Modern English, as shown in Table 25.

a. WITH LONG VOWELS: æcer 'acre', bydel 'beadle', beofor 'beaver', cradol 'cradle', efes 'eaves', efen 'even', hæfen 'haven', hæsel 'hazel', hlædel 'ladle', mapul- 'maple', nacod 'naked', hræfn 'raven', stapol 'staple', tapor 'taper'
b. WITH SHORT VOWELS: botm 'bottom', camel 'camel', canon 'canon', copor 'copper', fæder 'father', fæþm 'fathom', feþer 'feather', fetel 'fettle', hamor 'hammer', heofon 'heaven', hofel 'hovel', lator 'latter', ofen 'oven', oter 'otter', sadol 'saddle', seofon 'seven', sc(e)ofl 'shovel', wæter 'water', weder 'weather'

TABLE 25. Old English disyllabic nouns with short open syllables.

Before one or the other stem was generalized in the language, double forms with and without lengthening existed in the Middle English period: *crādel*, *wāter*, *ēven*

[20] A trace of such an alternation is *staff-staves*. Such alternations are of course found in words related by derivational morphology, such as *grass-graze*, *bath-bathe*, and so on.

beside *cradel*, *water*, *even* (Wright & Wright 1928:§102). Wright and Wright state that forms which are not present in the standard language have often survived in the dialects: *stăple*, *ĕven*.

Row d of Table 21 represents Old English disyllabic nouns with an original long vowel (all nominal classes—see Appendix 1). By our hypothesis, such nouns would have been subject to TSS in inflected forms, and should thus have become identical in vowel quantity to the disyllables with originally short vowels in row c. If it is correct that underlying quantity distinctions merged as shown in Table 20, we should expect to find that stems with original long vowels, too, have levelled in both directions, and this is just what we find; Table 26.

a. WITH LONG VOWELS: bēacen 'beacon', bītel, bīetel 'beetle', æfenn 'even(ing)', hūsl 'housel, Eucharist', stȳpel 'steeple', tācn 'token', brīdels 'bridle', fēfor 'fever', hæþen 'heathen'
b. WITH SHORT VOWELS: bōsm 'bosom', brōþor 'brother', dēofol 'devil', fōdor 'fodder', hæring 'herring', mōdor 'mother', rædels 'riddle', spātl 'spattle, saliva', þȳmel 'thimble', wæpen 'weapon'

TABLE 26. Old English disyllabic nouns with long vowels.

Our results for nouns that are hypothesized to have had vowel-length alternations in Middle English, i.e. nouns like those in rows b, c, and d of Table 21, are summarized in Table 27.

OE STEM TYPE	OE VOWEL LENGTH	EXPECTED ME LENGTH	NE SHORT #	NE SHORT %	NE LONG #	NE LONG %
Monosyll	Short	S - L	19	53%	17	47%
Disyll	Short	L - S	19	58%	14	42%
Disyll	Long	L - S	10	53%	9	47%

TABLE 27. Outcomes in classes with expected length alternation in Middle English.

The figures in Table 27 indicate the general trend; beyond that, we should not attach too much importance to the specific numbers. These numbers are based on forms in our data base that have Modern English descendants that preserve the original number of syllables; hence, we exclude Old English words of the relevant class that have no reflexes in modern English (e.g. *ātor* 'poison'), or original disyllables that have monosyllabic reflexes (e.g. *hænep* 'hemp'). Whether an Old English word has an appropriate reflex in the modern language is at least partially a matter of chance unrelated to its having undergone vowel lengthening or shortening. The accidental absence of such forms could introduce some arbitrariness into the statistics. A second source of arbitrariness is the selection of Modern English forms where variants exist—should we pick *cradle* or *creddle*, *staff* or *stave*? We have picked the most common form in the standard language, but such variants have no privileged status as indicators of the Middle English vowel length. Third, as mentioned earlier, we must allow for possible influence from other declensional classes (e.g. is NE *grave* from OE *græf* or *grafu*?). Fourth, though we have omitted certain forms whose vowel length has been influenced by factors other than OSL and TSS,[21] there are phonological influences on the length of the stressed vowel that we may not be allowing for (e.g. the final glide may contribute to long outcomes in *day*, *way*, etc.). Fifth, the choice of the modern standard language is itself arbitrary; dialects may preserve words that are obsolete in the standard, or they may have cognates with different vowel length. Sixth, and most important, is the fact

[21] Some of these cases are discussed elsewhere in this article. See, for example, the discussion of forms like *nephew*, above, and *body* and other types of words below.

that Middle English is known to have had considerable variation that is only imperfectly reflected in any modern dialect, not to mention words that are known to have had a different vowel length from their reflexes in modern standard English. Indeed, if our hypothesis is correct and Middle English had length alternations that were subsequently levelled, then the proportions of long and short vowels that we find in the modern dialects reflect nonphonological influences on the direction of levelling that may have varied in different dialects.

Nevertheless, even allowing for all these factors that could have caused the figures in Tables 23 and 27 to have come out differently, two results emerge quite clearly. First, in word classes where all forms of the paradigm had long vowels (Table 23), the modern reflexes overwhelmingly have long vowels. Second, where we hypothesize a length alternation in the Middle English paradigm (Table 27), the modern reflexes show both short and long outcomes, with a slight preference for short vowels. These results are highly significant, for, as we will argue in the next section, they are entirely consistent with our hypothesis of OSL and TSS followed by levelling, but they are not consistent with any version of a compensatory lengthening analysis that has been proposed to date.

4.2. MIDDLE ENGLISH COMPENSATORY LENGTHENING? The idea that levelling plays a large role in accounting for the apparent exceptions to MEOSL is, of course, not new, and has been assumed by every textbook account of the process. This traditional view was seriously challenged, however, by Minkova (1982). Minkova argued that evidence based on word counts supports the view that MEOSL depends on the loss of an unstressed vowel. In the previous section, we showed in a general way why it might appear that this is the case. We will now look more closely at the evidence, and argue that an approach that takes into account paradigmatic classes presents a different picture from the one sketched in Minkova 1982. We will then consider the relative merits of our proposal and a compensatory lengthening account.

Minkova states that her list includes all entries in Holthausen 1934 with the relevant environments and which have survived beyond 1500, with cross-reference to the OED (1933). The list was collated with the word lists in Sweet 1888, the additions being mostly words of Scandinavian origin. Minkova states, 'The variability of forms within Middle English is enormous; here I shall confine myself to a comparison between the Old English input and the Modern English output, assuming that the difference between input and output arose in Middle English'(1982:53–54).

Thus, the relevant criterion employed is the length of the vowel in Modern English in forms that survived past 1500. As we have observed above, such a method can give us a distorted picture of the true Middle English situation. Middle English presents us with enormous variability, particularly with respect to vowel length, which we abstract away from when we look only at the outcome in the modern language. Further, the selection of standard Modern English as the relevant criterion is rather arbitrary; this particular dialect is not necessarily a more reliable guide to Middle English length than any other dialect that descends from Middle English. In fact, Minkova also occasionally includes obsolete or dialectal forms, such as *uvver* for *over*, and *thode*. Without some objective criterion, it is not clear on what basis these forms were selected.

As for the selection of Old English words to include in the list, our argument is that a word's declensional class plays a central role in determining whether it will consistently show a long or short vowel in Modern English, or whether there will be variation. Thus, it is important to consider words according to their class, rather than look at

OLD ENGLISH	MIDDLE ENGLISH	ENGLISH
blæd	blad	blade
col	col	coal
dæl	dale	dale
geat	gate	gate
græf	grafe	grave
hol	hol	hole
hwæl	whal, hwal	whale
stæf	staf	stave

TABLE 28. Short monosyllabic *a*-nouns listed in Minkova 1982.

overall numbers. For example, among the Old English nouns in Minkova's list we have identified eight short monosyllabic *a*-nouns (Table 28). They all have long vowels in Modern English.[22] But as reported in Table 24, we found 36 such nouns, of which 17 have long vowels in Modern English and 19 have short vowels. When we search for nouns by declension class, it is possible to obtain quite different results than when we consider words of all classes together.

Minkova's figures for disyllables with original short vowels also present a different picture from the one we found (Table 25). She finds 96 words with Modern English short vowels, or 81.4% of the total, and 22 with long vowels, or 18.6%. The impression is that such words only rarely have long vowels in Modern English. The discrepancies between our figures and hers can be traced to the fact that her list contains a heterogeneous group of words. Besides words of the sort we considered, it includes words with internal clusters that appear to have inhibited OSL (*bastard*, *jaspis*, etc.), verbs with many trisyllabic forms that would have undergone TSS (*gather* from OE *gædrian*, ME *gadrian*, etc.), words with suffix *-ig*, which appears to have inhibited lengthening (*berry*, *many*), and other words that present some kind of special circumstance.

Concerning words ending in [i:], like *body*, it should be noted that (a) there was length variation in Middle English and (b) both original Old English long vowels as well as short vowels are found short in Modern English: OE *ǣnig*, ME *ēni*, pl. *anie*, *enie*, NE *any* (Wright & Wright 1928.§91); OE ME *rēdi*, *redili*, NE *ready*; OE *bodig*, ME *bōdi*, pl. *bodies*, NE *body*. These facts support our hypothesis that the uninflected forms underwent OSL (otherwise there would have been no length variation in Middle English), and that the inflected plurals underwent TSS (otherwise the original long vowels would have had no reason to shorten). These paradigms were thus vulnerable to restructuring that was independent of their original length. One explanation for the prevalence of short vowel outcomes in these words is that the second syllable bore a secondary stress (Lass 1992:73).

With respect to words like *gannet* from OE *ganot*, Lass writes that lengthening is 'more likely to be inhibited' if the last syllable ends with a consonant (1992:73). One referee has pointed out that the lengthening is blocked when the final consonant is an obstruent rather than a sonorant, and we agree that this is indeed so. Words ending in final sonorants can go in both directions. It is not clear why this should be the case, but it should be noted, that there are relatively few disyllabic words with final obstruents of Germanic origin in Old English to begin with. Most such words have either not survived into Modern English (*werod* 'troop', *reced* 'house', *sǣwet* 'sewing'), or have become monosyllabic in English regardless of the length of the stem vowel. If the

[22] We note that Holthausen gives NE *staff* for the last form, not the rarer *stave*. Holthausen also records OE *stæfer*, which he glosses as 'ne. dial. *staver*', a form not listed by Minkova.

OLD ENGLISH		DUTCH		GERMAN		ENGLISH
hafoc	S	havik	L	Habicht	L	hawk
hēafod	L	hoofd	L	Haupt	L	head
mōnaþ	L	maand	L	Monat	L	month
drūgoþ	L	droogte	L			drought

TABLE 29. Vowel deletion before final obstruent in English.

German and Dutch cognates are compared, we find a long vowel as expected; some examples are listed in Table 29. In contrast with these, OE *nacod*[23] remains disyllabic in NE *naked*, but its cognates are monosyllabic: German *nackt*,[24] Dutch *naakt*. Of these words, *naked* and *gannet* appear as disyllabic in modern English, one with a long vowel and the other short.

Table 30 is a list of the Old English obstruent-final disyllabic nouns in our data base that have survived in one form or another into Modern English. This list includes only nouns that could have been subject to lengthening in Middle English; hence we exclude words with medial clusters or contexts that could create special conditions (such as words that end in glides, or words with final consonant clusters).

a. MONOSYLLABIC IN MODERN ENGLISH: hafoc 'hawk', darod 'dart', heorot 'hart', hænep 'hemp', merisc 'marsh', warod 'warth', weoloc 'whelk'

b. DISYLLABIC IN MODERN ENGLISH: celis 'chalice', ganot 'gannet', paroch(e) 'parish', planet(e) 'planet', readic 'radish', trefet 'trivet'

TABLE 30. Old English obstruent-final disyllabic nouns with short stressed vowels.

This leaves the words in row b of Table 30. Many of these, like *planet*, *parish*, *chalice* were in all probability borrowed into Middle English as trisyllabic words,[25] and hence could not have ever had a long vowel.[26] According to the OED, *trefet* 'trivet' occurs in a twelfth-century copy of a tenth-century document, but is otherwise not known until the fifteenth century. We are thus left with a handful of cases that could have undergone lengthening in Middle English.

Words like *haddock*, *thicket*, *abbot* had long medial consonants which would block borrowing. Therefore, a detailed examination of disyllables with final obstruents reveals that the preponderance of short vowel outcomes can be explained by factors that are independently required in any analysis. There is thus no evidence that final obstruents blocked OSL in disyllables.

To sum up, though a global survey of Old English words and their Modern English reflexes could give the impression that vowel lengthening applied regularly only in words that also lost a syllable, a systematic review by morphological class presents a different, and we believe more accurate, picture.

4.3. COMPARING ANALYSES. Let us consider now how a complementary lengthening (CL) analysis fares in accounting for the various cases in Table 21. We will consider each row in turn.

Words like OE *talu* in row a are characterized by vocalic suffixes in both the singular and the plural, and so are predicted to show lengthening by a CL analysis. In fact, this

[23] A referee suggests that *naked* could be related to a verb form with lengthening. In many instances, however, the levelling of quantity can go in both directions even if the noun is related to a verb.

[24] The vowel is short due to an original medial geminate because of the High German consonant shift.

[25] See Minkova 1985:176, n. 4 for the same point.

[26] See Lahiri & Fikkert 1997 for a detailed discussion of TSS and loan words.

is the only class of nouns in Old English which could undergo CL after the loss of the vowel in the nominative singular. Under the OSL analysis, both singular and plural forms would undergo lengthening and hence these nouns should exceptionlessly contain long vowels. Presumably, the same result is predicted by an OSL analysis if the plural vocalic suffix was also lost. However, the plural ending was never quite lost; the [-es] ending of the *a*-nouns was extended to this class. According to most chronologies (see Lass 1992), deletion of inflectional schwa followed by a consonant postdated lengthening of the stressed vowel. Therefore, according to the CL account, the lengthening must have extended to the plural by analogy. But then it is not explained why analogy is so regular in just this class.

Row b of Table 21 exemplifies monosyllabic *a*-nouns. Recall that an OSL account predicts a length alternation, with the uninflected nominative and accusative singulars retaining a short vowel, and all the inflected forms undergoing lengthening. We further suppose that this alternation was then levelled either in favor of the short or long vowel. A CL analysis must posit something similar in order to account for the long vowel outcomes, since the uninflected forms do not have the environment for CL. The difference in a CL account is that many of the inflected forms also lack the CL environment, on the assumption that CL was triggered by word-final schwas, and not by vowels protected by final consonants. The complete paradigm of Old English *a*-nouns is shown in Table 31.

	SG	PL
NOMINATIVE	stān	stānas
ACCUSATIVE	stān	stānas
GENITIVE	stānes	stāna
DATIVE	stāne	stānum

TABLE 31. Old English *a*-nouns.

By Middle English times, the inflectional vowels had all reduced to schwa. Minkova (1982:53 n. 2) proposes that the analogical influence comes from inflected forms with a final *-e*, 'assuming that the frequency of occurrence of a final *-e* in the paradigm of early Middle English nouns (all of them, not just the Old English *a*-stems) outnumbers *-es* inflections, which some authors take as basic in producing the analogical lengthening'. The reference to other noun classes is presumably prompted by a suspicion, which we share, that the vowel-final oblique forms in the *a*-nouns themselves—the dative singular, genitive plural, and perhaps the dative plural if the final nasal consonant had dropped early enough—would not have had sufficient influence to compete with the more important nominative and accusative singulars and plurals, as well as with the genitive singular. We find it implausible, however, to suppose that the common *a*-nouns would have somehow been influenced by analogical patterns prevailing in other noun classes. We will consider this matter further in the next section, where we discuss the motivation for analogical levelling.

Two conclusions emerge from this review of the monosyllabic *a*-nouns. First, the CL analysis also requires an appeal to paradigmatic levelling of a hypothesized length alternation in order to explain the mixed outcomes in this class. Second, the hypothesized vowel-length alternation posited by the CL analysis is much more weighted in favor of short vowels, and does not explain why the proportion of long-vowel outcomes in this class is close to 50%.

Hogg (1996) adds an additional piece of evidence drawn from the monosyllabic *a*-nouns in support of a general lengthening in open syllables. The /ɑ/ ~ /æ/ alternation

in Old English nouns like *hwæl* ~ *hwalas* has its source in a phonological change of /æ/ to /ɑ/ in the context of back vowels (*a*-restoration), followed by a subsequent morphological levelling whereby /æ/ occurs in all singular forms and /ɑ/ in the plural. Hogg claims, in addition, (1996:70) that there was phonetic lengthening of OE /æ/ in open syllables which produces a half-long /a·/, suggesting a subphonemic lengthening of /æ/, not equivalent to /ɑ:/.[27] Hogg suggests that this phonetic lengthening, reflected in other hitherto unexplained analogical levellings, is the forerunner of the later OSL in Middle English. This being so, vowels in the plurals of monosyllabic *a*-nouns would have already been phonetically long, and OSL would have made them phonologically long as well.

A CL analysis predicts no lengthening at all in disyllabic nouns with original short vowels, as in row c of Table 21. We have seen however, that a significant proportion of such words have long vowels in the modern language—over 40%, in the absence of independent factors that conspire against long vowels in such forms. The OSL analysis accounts for such cases in the same way as for words like *hwæl*: by bidirectional levelling of a length alternation. We have seen that the CL analysis also requires levelling in the monosyllabic nouns; the problem in the disyllables is that there is no basis for CL to create a length alternation in the first place.

Disyllables with original long vowels (row d of Table 21) come out with almost the same proportion of short vowels as disyllables with original short vowels. These results cannot be attributed to any failure of vowel lengthening, because the vowels were long to begin with. Rather, we must find a source for short vowels in such paradigms. The only relevant shortening rule that we are aware of is TSS. If TSS was not part of grammar, it is difficult to explain why original long vowels in disyllabic words would have become short.[28] Therefore, it appears that a CL analysis must also posit TSS in these forms, followed by levelling of vowel length in both directions.

		OE		Hypothesis 1: OSL, TSS, and restructuring				Hypothesis 2: CL		
				ME		NE		ME	NE	
a.	SG -V	PL -V(C)		OSL in SG and PL		Expect V:		CL in SG	Expect V:	
	talu	tala		tālə	tālə > tāləs	tale	[e:]	tāl	tale	[e:]
	nama	naman		nāmə	nāmən > nāməs	name	[e:]	nām	name	[e:]
b.	SG -V	PL -V(C)		OSL in PL: restructuring		Expect V and V:		No CL	Expect V	
	hol	holu		hol	hōlə > hōles	hole	[o:]	hol	*hol	*[ɔ]
	god	godes		god	gōdes	god	[ɒ]	god	god	[ɒ]
c.	SG -Ø	PL -V(C)		OSL in SG, TSS in PL: restructuring		Expect V and V:		No CL	Expect V	
	hamor	hamoras		hāmor	hamores	hammer	[æ]	hammer	hammer	[æ]
	beofor	beoferas		bēver	beveres	beaver	[i:]	bever	*bever	*[ɛ]
d.	SG -Ø	PL -Ø, -V(C)		TSS in PL: restructuring		Expect V and V:		No CL	Expect V:	
	hæring	hæringas		hæring	hæringes	herring	[ɛ]	herring	herring	*[ɛ]
	stȳpel	stȳpelas		stȳpel	stypeles	steeple	[i:]	steeple	steeple	[i:]

TABLE 32. Summary of nouns with and without lengthening in both theories.

[27] Hogg's arguments are based on strong adjectival forms like *hwæt* 'active' where there was no analogical levelling of the vowels according to number distinctions.

[28] Minkova (1985:166) also refers to the same TSS constraint in supporting the view that the disyllabic condition on lengthening is a must. 'Also, by abandoning the disyllabic condition for the lengthening we would allow it to affect words of originally more than two syllables. This never happens: and if it did, it would intersect the trisyllabic shortening rule: *holi* vs. *holiday*, *south* vs. *southern*, OE *ærende* 'errand'. However, she does not refer to the connection between the bidirectional restructuring of original long and short vowels and the interaction of OSL and TSS.

Assuming CL alone, without TSS or paradigmatic levelling, can account for one type of word in Table 21 (*talu*, in row a), but fails to account for the mixed vowel length found in descendants of words in the other three rows. Adding TSS and levelling allows a CL analysis to account for row d, though it still has difficulty with row b, and has no explanation of long-vowel outcomes in row c. The crucial cases are summarized in Table 32. A comparison of the OSL analysis with the CL analysis shows that the former provides a better account of the facts.

4.4. ANALOGICAL RESTRUCTURING. Although we believe that an appeal to analogy in the cases we have discussed is entirely appropriate, and indeed unavoidable, two issues require some discussion. First, why did the levelling occur? Second, why is levelling bidirectional?[29] We first turn to the reason for the levelling.

At some point in the late Middle English period the schwa in plurals was dropped after vowel-final stems to avoid hiatus, and often in polysyllabic words: *tree-s*, *argument-(e)s*, *book-es* (Lass 1992:111). Gradually, the schwa was dropped everywhere (except when it followed a sibilant) with the remaining *-s* assimilating in voicing to the preceding segment.[30] After OSL and TSS, the loss of the inflected vowel leaves the vowel-length situation in a confused state, as illustrated in Table 33.

a. Before loss of inflected vowel

SG	PL	SG	PL	SG	PL	SG	PL
stōn	stōnes	bōdi	bodies	bēver	beveres	god	gōdes

b. After loss of inflected vowel

SG	PL	SG	PL	SG	PL	SG	PL
stōn	stōns	bōdi	bodis	bēver	bevers	god	gōds

TABLE 33. Expected vowel length alternations before and after loss of plural *-ə*.

In the pair *stōn–stōnes*, both vowels are long and there is no question of levelling. However, in some words, there is lengthening in the plural, but no change in syllable structure, while in other words the plural is associated with shortening. There are no prospects for salvaging a phonological rule from this situation. Nor can vowel quantity be associated with any morphological category. According to Kuryłowicz's (1945–49) first law, phonological alternations marking a morphological distinction are more likely to be increased rather than removed; in his words, a bipartite morpheme tends to replace a unitary one. An example of this would be the analogical creation of the plural *Töpfe* (singular *Topf*) from earlier *Topfe* on the basis of word pairs like *Kopf-Köpfe*. In this instance, the plural schwa ending was enhanced by umlaut. Is not the levelling of vocalic length in English going in the opposite direction? Not really, because the length alternation does not go hand in hand with number marking. Hence, a morphological rule is also unavailable, because vocalic length can be a property of the singular as well as the plural.

There is no reasonable way to reconstruct a rule or set of rules that could lead to the observed alternations. In such circumstances, paradigmatic levelling is liable to step in. On our account, language learners despair of a rule, and opt instead to choose a consistent vowel quantity on a word-by-word basis. For each pair, a new stem is restruc-

[29] Dresher (1998) discusses in detail types of levelling and the importance of the nominative singular.

[30] According to Lass 1992:81, this development did not stabilize until the sixteenth century.

tured, and since there is no particular bias for choosing a long or a short vowel, either underlying representation can be selected.[31]

We observe that in both English and German, the plurals (more precisely, the inflected forms) play at least as important a role as the singulars (the uninflected forms). Does this not contradict a principle proposed by various students of analogy that holds that the singular forms should prevail over the plural, and that the nominative is more important than the other cases (see for example Lahiri & Dresher 1983–84)?[32]

We have argued previously that when learners are acquiring new words and make decisions about what declensional class a word belongs to, added weight is given to the nominative singular. If the nominative singular looks like it belongs to a major class, learners will tend to assign it there, even if evidence against this classification is provided by other forms of the paradigm. Thus, the surface identity of the nominative singular of the heavy *u*-nouns, like *feld* (from /feld+u/, with the final -u deleted by high vowel deletion), with the *a*-nouns, like *stān*, led these nouns to be shifted to the *a*-class. This shift happened in spite of the fact that the other oblique forms were distinct.[33]

The levelling of vowel-length alternations in English is a different kind of case, however. Here it is not a question of establishing membership in a declensional class, but rather of establishing a lexical representation for a stem. In such situations, it appears that the nominative singular does not have as much influence, but that other forms of the paradigm can play important roles, also. Evidently, language learners pay attention to allomorphy in attempting to arrive at a lexical representation. Such cases are sometimes presented, wrongly in our view, as examples where an oblique form replaces a nominative, or where a nominative is reformed on the basis of another member of the paradigm. But that is not what is really going on. Rather, in the absence of any principle for accounting for an alternation, and assuming that language learners wish to find a single lexical representation for lexical stems, learners abandon the alternation and assign words a single underlying representation. In this process, learners tend to consider the evidence of all the alternants, not assigning significantly greater weight to any member of the set. Presumably, this is the same process that occurs when they arrive at lexical representations in general.

Note that the motivation for the levelling of vowel length in German nouns is different from that of their English counterparts. The paradigms did not become incoherent in German. Rather, the segregation of stems ending in voiced and voiceless consonants set the stage for a reanalysis of OSL as lengthening before a voiced consonant. The results of the levelling in German are also quite different: here there is no word-by-word selection of a long or short vowel. Rather, the restructuring proceeds by classes in a consistent direction.

[31] This is not to say that there are no biases at all. In the absence of a clear generalization, various subgroupings may emerge that follow a particular pattern.

[32] It has sometimes been claimed (Kuryłowicz 1945–49) that the accusative singular is more important than the nominative in Romance. See Lahiri & Dresher 1983–84:149ff for discussion of this issue, and for arguments that the nominative is indeed the most important form in the paradigm.

[33] This is the pattern observed in the Mercian *Vespasian Psalter* (Dresher 1978:154f.) and in literary West Saxon. Richard Hogg points out that there is a different pattern in the charter material, where alongside nominative singular *feld* with the *a*-class plural *feldas*, there is frequently found plural *feldan* from the *n*-stems. Hogg suggests that the process is based on the dative singular *felda*, which can be interpreted as being a *n*-stem form, noting that this noun is most frequently seen in the dative because of its locative properties.

4.5. SUMMARY. A survey of selected Old English morphological classes reveals results quite different from those suggested by Minkova's (1982) listing. Our results suggest that MEOSL indeed applied in open syllables and did not depend on the loss of a following vowel. Rather, English was subject to essentially the same rule of OSL as Dutch and German, the main difference being that its results are much more obscured in English because of the presence of TSS and the subsequent levelling of length alternations.

OSL in Middle English appears also to have been subject to further limitations that we have not discussed in detail. For example, it does not apply with any regularity to high vowels, and so we have generally excluded high vowels from our discussion. Similarly, certain affixes appear to inhibit OSL, for reasons that are not entirely clear. It may be that the already complicated Middle English length situation created conditions in which various further limitations on OSL could arise.

Finally, even though we have, out of necessity, followed Minkova's strategy of counting Modern English forms with long and short vowels and drawing conclusions from them about how OSL must have applied in Middle English, the various caveats we raised earlier about this methodology still obtain. If our general approach is correct, the proportions of long and short vowels in Modern English that result from putative Middle English length alternations are reflections of patterns of quantity levelling that followed the application of OSL and TSS. Even in those cases where the context of TSS could not be met (CVC stems), the OSL analysis predicts better than any other analysis the ultimate outcome of long and short vowels in Middle English. Under this analysis it is no mystery that almost all CVC stems having vocalic endings in the singular and plural end up with long vowels, while the CVC *a*-stems with no vocalic ending in the singular show more variation due to analogy. It remains an interesting question why the levelling occurs in the proportions that it does. A detailed study of this issue, however, must focus on particular dialects of English at particular periods, for it is quite likely that somewhat different patterns obtain in different dialects.

We turn now to the effects of OSL in verbs.

5. OSL IN WEST GERMANIC VERBS. We have seen that Dutch, German, and English have different patterns of vowel length in noun classes where there was a potential length alternation after OSL. Dutch retains alternating long and short vowels, German has restructured stems with long vowels, and English shows rampant levelling of vowel quantity in both directions. The same patterns are found in the verbs. As with the nouns, we need to look at situations where the verbs originally had short vowels, and where there was a possibility for open syllable lengthening to create a short-long alternation. We will limit our discussion to the strong verbs, which present a variety of alternation types.

Traditionally, the four basic morphological categories of the strong verbs are represented by the infinitive and present, past singular, past plural, and the past participle; moreover, the six ablaut classes are characterized by different vowel alternations. Of importance here is not the quality of the stem vowel but its quantity in the basic morphological categories, because these reflect the quantity alternation in the different paradigms.

Tables 34 and 35 give the quantity of the stem vowels in the different verb classes in Old English and Old High German. The vowel-quality alternations in the various ablaut classes differ in the two languages, but the quantity is the same. In Table 34, V indicates a short vowel in an open syllable; VC indicates a short vowel in a closed

	INF/PRES	PAST SG 1,3	PAST PL/2 SG	PAST PART
Class I	V:	V:	V	V
Class II	V:	V:	V	V
Class III		V + liquid/nasal + C		
Class IV	V	VC	V:	V
Class V	V	VC	V:	V
Class VI	V	V:	V:	V

TABLE 34. Strong verb alternations.

syllable; and long V: could occur in both open and closed syllables. Some sample forms are given in Table 35.[34]

		INF	PAST SG	PAST PL	PAST PART
I	OE	bīdan	bād	bidon	biden
	OHG	bīdan	beit	bitun	gibitan
II	OE	cēosan	cēas	curon	coren
	OHG	kiosan	kōs	kurun	gikoran
III	OE	helpan	healp	hulpon	holpen
	OHG	hëlfan	half	hulfun	giholfan
IV	OE	stelan	stæl	stǣlon	stolen
	OHG	stëlan	stal	stālun	gistolan
V	OE	tredan	træd	trǣdon	treden
	OHG	trëtan	trat	trātun	gitrëtan
VI	OE	grafan	grōf	grōfon	gæfen/grafen
	OHG	graban	gruob	gruobun	gigraban

TABLE 35. Old English and Old High German sample strong verbs.

The class III verb stems are always in closed syllables and are of little interest here. In contrast, class I, II and VI have either long vowels or short vowels in open syllables in some inflected forms that would be prone to open syllable lengthening. This means that verbs in these classes could end up with long vowels throughout the paradigm if OSL does apply. Verbs belonging to classes IV and V originally had short vowels in both open and closed syllables along with long vowels. This means that after open syllable lengthening verbs in these classes could end up with alternating long and short vowels.

Although the medieval stages of the three languages (especially English) simplified the paradigms somewhat, the three distinguishing categories that essentially remain are the infinitive/present, the past tense forms, and the participle. Based on what we have seen for the nouns, we could make the following predictions (Table 36) for vowel quantity after open syllable lengthening in Dutch, English, and German.

a. Dutch	Class I, II, VI:	Long vowels in all forms
	Class IV, V:	Alternations: Inf./pres. long, past short
b. German	Class I, II, VI:	Long vowels in all forms
	Class IV, V:	Alternations > possible restructuring
c. English	Class I, II, VI:	Long vowels in all forms
	Class IV, V:	Alternations > levelling in both directions

TABLE 36. Predictions for vowel quantity after OSL.

[34] Paul & Mitzka (1959) and Campbell (1959:314) mention that some class V verbs had an original long vowel in the past singular in Old High German and Old English; e.g. OE *fretan, frǽt; etan, æt*. See note 11 on the length of 'short' low vowels.

5.1. DUTCH AND GERMAN. All infinitive forms of classes I and II remain long in Dutch and German, as one would have expected. Furthermore, as predicted, all the infinitives in classes IV, V, and VI are long, except where the postvocalic consonants underwent the second consonant shift in German. The interesting comparisons are the infinitives with original long vowels (classes I and II) (in late Old High German, the long fricatives were shortened when following long vowels), and those vowels that could be lengthened by OSL (Classes IV and V); when followed by spirantized consonants from the second consonant shift, the verb stems in the latter classes were closed, blocking OSL, while in the cases where the vowels were originally long, even when followed by long spirantized fricatives from the same source, the vowel length remained. In Table 37, a long vowel is indicated by L after the verb, a short vowel by S.

a. Classes IV & V

OLD ENGLISH	GERMAN		DUTCH	
metan	messen	S	meten	L
sprecan	sprechen	S	spreken	L
stelan	stehlen	L	stelen	L
cnedan	kneten	L	kneden	L

b. Classes I & II

OLD ENGLISH	GERMAN		DUTCH	
bītan	beißen	L	bijten	L
strīcan	streichen	L	strijken	L
grīpan	greifen	L	grijpen	L
cēosan	küren	L	kiezen	L
bēodan	(ge-)bieten	L	(ge-)bieden	L

TABLE 37. Effects of the second consonant shift: infinitives.

Thus, the vowel in German *messen* does not lengthen, while the corresponding Dutch word *meten* has a long vowel by OSL. Compare this to a class where there is an original long vowel in German, as in *beißen*: the long vowel remains, just like in the Dutch word *bijten*. Note that the German words *kneten* and *(ge-)bieten* did not undergo the second consonant shift because the medial consonants were originally voiced stops. As a result, both words have synchronically long vowels, the former by OSL and the latter because it was originally long.

Of primary importance are the past tense forms of classes IV and V. Recall that in these classes the past tense singular had a short vowel in a closed syllable, the infinitive/present and the past participle had short vowels in open syllables, and the past plural had a long vowel in an open syllable. If there was open syllable lengthening and no levelling, as in the Dutch nouns, this is where we expect vowel-length alternations. Further, if the verbs are subject to the same pattern of restructuring as in the nouns, we would expect that German verbs would end up with some degree of levelling after OSL.

This is precisely what happens. The Dutch verbs of these classes predominantly have an alternation, where the vowel is short in the past tense and long in the infinitive/present and the past participle; the vowels in the infinitive/present and past participle are in open syllables, and in closed syllables in the past (Table 38).

In contrast, the German class IV and V verbs (without fricatives) have levelled out vowel length in favor of the long vowels from infinitives after OSL; i.e., the past tense forms in closed syllables are long. And although there was no lengthening in the infinitive and the past participle where the vowels were in closed syllables followed by original geminate fricatives, the past tense forms are long; obviously the entire past tense levelled out in favor of long vowels. Note, however, that the lengthening in the

INF/PRES		PAST		PAST PART		GLOSS
meten	L	mat	S	gemeten	L	'measure'
breken	L	brak	S	gebroken	L	'break'
spreken	L	sprak	S	gesproken	L	'speak'
stelen	L	stal	S	gestolen	L	'steal'
lezen	L	las	S	gelezen	L	'read'
steken	L	stak	S	gestoken	L	'stick'

TABLE 38. Dutch quantity alternations in classes IV and V.

infinitive must have come from OSL, because it occurs only in open syllables, with short vowels preserved in closed syllables.

INFINITIVE		PAST		GLOSS
messen	[ɛ]	maß	[a:]	'measure'
sprechen	[ɛ]	sprach	[a:]	'speak'
treten	[e:]	trat	[a:]	'kick'
lesen	[e:]	las	[a:]	'read'
stehlen	[e:]	stahl	[a:]	'steal'

TABLE 39. Infinitive and past of German class IV and V verbs.

One could perhaps argue that the lengthening in the infinitives of class IV and V is not due to OSL, but is rather an extension of the levelling in favor of the long vowel observed in the past forms. This possibility is ruled out, though, because it cannot be a coincidence that *only* the verbs without original long consonants are lengthened.

That the past tense lengthening and then levelling throughout the paradigm in class IV and V must have been triggered by OSL is evident when we compare the development of the past in the class I and II verbs. In these classes, too, there was an alternation, but of an entirely different sort. As we mentioned before, in class I and II the infinitive and the past tense both had long vowels in all verbs regardless of stem-final consonant types right from Old High German. In late Middle High German (Prokosch 1933:55, and others) these overlong syllables were shortened in two ways: in polysyllabic words the geminate consonants were shortened after long vowels, and in monosyllables the vowels were shortened. As a result, in the (monosyllabic) past singular of these verbs, the original long vowel of Old High German shortens in late Middle High German when it is closed by a geminate [s:], [t:], or [f:], giving a length alternation of a different type, as shown in Table 40.

a. Class I

INFINITIVE		PAST		GLOSS
reiben	[ai]	rieb	[i:]	'rub'
scheinen	[ai]	schien	[i:]	'shine'
greifen	[ai]	griff	[ɪ]	'grasp'
schneiden	[ai]	schnitt	[ɪ]	'cut'

b. Class II

INFINITIVE		PAST		GLOSS
fliegen	[i:]	flog	[o:]	'fly'
stieben	[i:]	stob	[o:]	'spray'
schießen	[i:]	schoß	[ɔ]	'shoot'

TABLE 40. Infinitive and past of German class I and II verbs.

If in class IV and V the lengthening of the infinitive and the past singular had been a result of the original long vowel in the past plural, the differences in these classes

would have been neutralized, and the resulting alternations should have been the same. That such a neutralization does not occur argues in favor of our account.[35]

5.2. ENGLISH. In English, many Old English strong verbs were lost and many shifted to the weak class. From those that did survive as strong verbs, we find that the length of the original vowels has often not been maintained. At first glance, there seems to be no set pattern. But if, according to our hypothesis, levelling took place maximally in paradigms that had a length alternation after OSL, then the classes of interest are IV and V, where the infinitive and present indicative had many forms with a short vowel in an open syllable, but the preterite singular form had no ending and therefore was a closed monosyllable. Verbs of class I and II, on the other hand, originally had a long vowel or a short vowel in an open syllable which potentially would undergo OSL. We would therefore expect that if these verbs survived they would do so with long vowels.

A caveat is necessary at this point. Since in general the high vowels were the most resistant to lengthening, we should expect some deviation in those morphological classes where the high vowels were in open syllables; the most obvious case is the past plural and participle of the class I verbs, which had an [i] in an open syllable. This is precisely what we do find. We need to consider Middle English forms because there has been further levelling in Modern English. For clarity, we repeat in Table 41 the actual ablaut grades in Old English with the attested Middle English vowel types.

		INF	PAST SG	PAST PL	PAST PART
a. I	OE	ī	ā	i	i
	ME	ī	ō/ā	i	i
b. II	OE	ēo/ū	ēa	u	o
	ME	ē/ū	ē	ō/u	ō
c. IV	OE	e	æ	æ(ē)	o
	ME	ē	a	ē	ō
d. V	OE	e	æ	æ(ē)	e
	ME	ē	a	ē(ē)	ē

TABLE 41. Old English and Middle English strong verb patterns.

First, the class I verbs in Middle English consistently have long vowels in the infinitive and the past singular but do not lengthen in the past participle, although the vowel is in an open syllable. Since the vowel in question is [i], it does not lengthen (Table 42a).[36] This long/short distinction has been maintained in Modern English (Table 43a).

a. Class I

INFINITIVE	PAST PART	ENGLISH
drīven	driven	drive
rīden	riden	ride
wrīten	writen	write
bīten	biten	bite

b. Class II

INFINITIVE	PAST PART	ENGLISH
chēsen	chōsen	choose
frēzen	frōzen	freeze
sūken	sōken	suck
schūven	schōven	shove

TABLE 42. Class I and II Middle English verbs.

[35] Later, there was a general degemination—but the vowel length can be somewhat predicted from the original geminates. Note also that *kommen* changed differently.

[36] One referee suggests that an additional reason for the [i] in the past participle not to have lengthened is due to the wish to distinguish it from the long vowel in the infinitive.

a. Class I					
drive	[ɑɪ]	drove	[oʊ]	driven	[ɪ]
write	[ɑɪ]	wrote	[oʊ]	written	[ɪ]
ride	[ɑɪ]	rode	[oʊ]	ridden	[ɪ]
bite	[ɑɪ]	bit	[ɪ]	bitten	[ɪ]
b. Class II					
freeze	[i:]	froze	[oʊ]	frozen	[oʊ]
choose	[u:]	chose	[oʊ]	chosen	[oʊ]

TABLE 43. Class I and II verbs in Modern English.

In contrast, the stem vowels of the past plural and the participle in class II are in open syllables and are not high, and so they do lengthen (Table 42b). Many of these verbs, like *sūken* and *schūven*, have weak preterites with variable length already in Middle English, and in Modern English many of them are weak verbs. Nevertheless, as expected the Class II verbs, in contrast to those in class I, have long vowels in the infinitive, past and past participle—the last category having derived length from OSL (Table 43b).[37]

We expect the maximum amount of levelling in the class IV and V verbs. Recall that here the original vowels in the infinitive and the past participle were short in open syllables, the past singular had a short vowel in a closed syllable, and the past plural was long. If OSL did apply, the paradigms would still have length alternations; moreover, the present participle (original short vowel in an open syllable) would undergo trisyllabic shortening, adding further variation in length. Again, our expectations are borne out: there is tremendous dialect variation, and even when some verbs showed lengthening in the early Middle English period in the infinitive, they later levelled out to the short form.[38] A comparison of Middle English forms and the present day occurrences (Table 44) indicates the levelling.

MIDDLE ENGLISH				MODERN ENGLISH			
tēren	[e:]	tar	[a]	tear	[ɛ:]	tore	[ɔ:]
stēlen	[e:]	stal	[a]	steal	[i:]	stole	[o:]
trēden	[e:]	trad	[a]	tread	[ɛ]	trod	[ɔ]
gēten	[e:]	gat	[a]	get	[ɛ]	got	[ɔ]
brēken	[e:]	brak	[a]	break	[e:]	broke	[o:]
wēven	[e:]	waf	[a]	weave	[i:]	wove	[o:]
ētan	[e:]	at	[a]	eat	[i:]	ate	[ɛ/e:]

TABLE 44. Middle English and Modern English class IV and V.

We cannot infer too much from those verbs that transferred to the weak class, though it is interesting that it is precisely the verbs belonging to class IV and V which have retained the ablaut grades (i.e. that are still strong) that show this type of levelling in either direction.

6. MOTIVATION FOR OSL. Lass (1985:259) suggests that MEOSL and associated changes in prosodic typology 'are part of a chain of long duration, indicating a "habit"

[37] Beside *chēsen* we find also *chōsen*, *chūsen*; what is important for this discussion is the length of the vowel.

[38] Could the infinitives in column one of Table 43 be accounted for by CL, as one reviewer suggests? We think not. CL requires the second syllable to be lost for the lengthening to occur. The infinitive ending was present in Middle English when these vowels lengthened.

of prosodic alteration with a certain directionality, which characterizes a period in the history of Germanic'. Though we do not see these changes in quite the same way he does, we agree that OSL is connected to other aspects of West Germanic prosodic structure,[39] and we will attempt to fill in the prosodic background against which OSL should be viewed.[40]

6.1. THE GERMANIC FOOT. Syllable weight in the older Germanic languages is straightforward: syllables with short vowels are light, and closed syllables and syllables with long vowels are heavy. We argue (Dresher & Lahiri 1991) that the metrical foot is a resolved and expanded moraic trochee ([μμ(μ)]μ), where the head, indicated by square brackets, must dominate at least two moras. When the stressed syllable is light, i.e. when the two moras of the head could not come from one syllable, it is 'resolved' or bound together with the second syllable (regardless of the weight of that syllable) to form a single metrical unit. In parametric terms, the Germanic metrical structure is as in 2, and sample parsings are given in 3.

(2) The Germanic Foot (Dresher & Lahiri 1991)
Foot type: resolved expanded moraic trochee (Hd Dep), Hd = μμ(–μ), Dep = (μ)
Direction of parsing: left to right
Main stress: left

(3) Sample parsings

(x .)	(x .)	(x .)
([μμ] μ)	([μ μ] μ)	([μ μμ] μ)
H L	L L L	L H L
wor da	we ru da	cy nin ga

This equivalence of a heavy bimoraic syllable to a sequence of a light monomoraic syllable followed by any syllable (LX = H) plays a role throughout the Germanic languages. Dresher & Lahiri 1991 provides several types of evidence supporting the Germanic foot, including main and secondary stress, high vowel deletion (HVD) in Old English, and Sievers' Law in Gothic. The Old English words in 4 illustrate the metrical pattern, where the boldface high vowels undergo deletion in the weak branch of the foot.

(4) High Vowel Deletion in Old English

(x .) .	(x .)	(x .)	(x .) .
([μμ] μ) μ	([μμ] μ)	([μ μμ] μ)	([μμ] μ) μ
H L L	H L	L H L	H L L
hēa **fu** de	wor **du**	fæ rel **du**	clī we nu

(x .)	(x)	(x .)	(x)	(x)
([μμ] μ)	[μμ]	([μ μ] μ)	([μ μ])	([μ μμ])
H L	H	L L L	L L	L H
hēa **fu**	des	we ru **du**	lo fu	su num

[39] An early attempt to unify the various Middle English quantity changes was made by Luick (1898); see Ritt 1994:1–5 for an interesting discussion of Luick's proposal and why it did not succeed. According to Ritt, Luick's proposal did not make it into the handbooks because his ideas could not be suitably expressed in terms of the linguistic theory of the time.

[40] The following account is based on Lahiri 1994, 1995, and Lahiri et al. 1999.

Notice that in words like *hēafde* and *hēafdes* there is a syllable left over after the initial foot bearing main stress. Where this syllable is light, it is insufficient to form the head of a foot, and is arguably left unfooted. A heavy final syllable could in principle serve as the head of a foot, which would lead us to expect it to have a secondary stress. Nevertheless, no Old English final syllable, whether heavy or light, bears a secondary stress (Campbell 1959:§§87–92). When a heavy syllable becomes nonfinal due to the addition of suffixes, it does bear secondary stress when in an appropriate metrical position. Thus, we find alternations such as *ōðer* 'other n.s.'.–*ōðèrne* 'a.s.' and *æðeling* 'prince n.s.'–*æðelìnges* 'g.s.'. Their metrical structures are shown in 5, where a boldface x indicates a syllable that lacks secondary stress.

(5) Lack of secondary stress in final syllables

(x)	**(x)**	(x)	(x	.)	(x)		**(x)**	(x)		(x)	**(x)**
([μμ])	([μμ])	([μμ])	([μμ])	μ)	([μ	μ])	([μμ])	([μ	μ])	([μμ])	([μμ])
H	H	H	H		L	L	H	L	L	H	H
ō	ðer	ō	ðer	ne	æ	ðe	ling	æ	ðe	lin	ges

Dresher and Lahiri (1991:260) account for the lack of stress by a rule of final destressing.

(6) Final Destressing (FD) (Dresher & Lahiri 1991:260)
Defoot a final weak nonbranching foot (that is, a foot with no W branch).

The effect of final destressing is to make final heavy syllables metrically similar to final light syllables. This equivalence sets the stage for a reanalysis of final heavy syllables.

6.2. CONSONANT EXTRAMETRICALITY. As noted above, Old English has two types of heavy syllables: syllables with long vowels, and syllables closed by a consonant. Whereas both types continue to exist in stressed position (e.g. *stāne*, *worde*), unstressed long vowels had been shortened by the time of the earliest Old English texts (Hogg 1992:232). Therefore, the only unstressed heavy syllables existing in Old English are those closed by a consonant. Now final destressing is open to reinterpretation by the language learner: rather than defooting a nonbranching weak foot (which is to all intents and purposes a final heavy syllable), the same effect can be achieved by making a final consonant extrametrical.

(7) Final consonant extrametricality (CEM)
Final consonants are extrametrical.[41]

Final consonant extrametricality turns a syllable of the form CVC# into the metrical equivalent of CV#; since a single light syllable does not suffice to form the head of a foot, it can never be stressed in final position.

We observe that consonant extrametricality was not an option at an earlier stage of Old English and the other Germanic languages, because of the presence of long vowels in final syllables. Making a final consonant extrametrical would have had the effect of making a CVC# syllable light but would have had no effect on CV̄# or CV̄C# syllables. These syllables also would have undergone final destressing. The advantage of this interpretation is that all final unstressed syllables can now be treated as metrically equivalent, rather than final light syllables being stray and final heavy syllables being

[41] We assume that extrametricality does not apply when the final consonant is required to supply the second mora in monosyllabic words such as *scip*.

defooted. We assume that, in the absence of contrary evidence, a uniform analysis of similar facts is the preferred one.[42]

The reanalysis of FD as CEM has no immediate effects on the placement of stress in words: syllables that bore stress before continue to do so, and previously unstressed syllables remain unstressed. The change does affect the metrical analysis of many

	FD	CEM	EXAMPLE
a.	([LL])	([LL])	scipe
b.	([LH])	([LL])	water
c.	(HL)	(HL)	stāna
d.	(H) *(H)*	(HL)	stānas
e.	([LL] L)	([LL] L)	werude
f.	([LL]) *(H)*	([LL] L)	werudes
g.	([LH] L)	([LH] L)	cyninga
h.	([LH]) *(H)*	([LH] L)	cyningas
i.	(H) (HL)	(H) (HL)	*hēringe
j.	(H) (H) *(H)*	(H) (HL)	*hēringes
k.	(HL) L	(HL) L	*clāvere
l.	(HL) *(H)*	(HL) L	*clāveres

TABLE 45. Effects of reanalysis of Final Devoicing (FD) as Consonant Extrametricality (CEM).

types of words, however. Some typical patterns are given in Table 45.[43] The effect of introducing CEM is to increase the uniformity of metrical patterns, by abolishing the distinction between final H and final L. Further, since a light syllable can be the weak member of a foot where a heavy syllable cannot, under a CEM analysis many previously defooted final syllables can be included into a foot, as in Table 45d, f, h, and j. But these changes also result in some less desirable consequences. First, CEM leads to an increase in words where the second foot is branching while the main stressed foot is not (j). Assuming that the stressed foot is preferably as complex, or more complex, than its dependent, this is not an optimal configuration.[44] Second, CEM leads to many more final stranded syllables (1). A final heavy syllable can form a foot on its own, even though it is subject to defooting, but a final light syllable does not have enough weight to support a foot of any kind; when the weak branch of the preceding foot is occupied, it remains stranded. This situation is also less than optimal, on the assumption that languages prefer to parse syllables into feet whenever possible.

6.3. TRISYLLABIC SHORTENING. Trisyllabic shortening (TSS), introduced in late Old English or early Middle English (Campbell 1959:§329, Hogg 1992:§5.200, Wright & Wright 1928:§88), results in improvements to these metrical patterns. By TSS, long vowels in initial stressed syllables are shortened when followed by two or more syllables. The relevant cases are shown in Table 46.

Extrametricality allows the last two syllables to form a branching foot as in Table 46a, in contrast to the main stressed foot which remains nonbranching, as was the case

[42] A similar reanalysis is not possible in parallel stages of Dutch or German, because they retain unstressed long vowels; consonant extrametricality would not convert a syllable with a long vowel into a light syllable. See §6.5 for discussion of developments in these languages.

[43] A defooted foot is indicated as (*H*). We assume that final unfooted light syllables are stray, indicated as L. Some forms like **hēringe* are marked with an asterisk because the attested forms had already undergone trisyllabic shortening, as discussed in the next section.

[44] See Dresher & van der Hulst 1993, 1995 for discussion of such asymmetries.

	OLD ENGLISH	ME 1: CEM	ME 2: TSS	EXAMPLES
a.	(H) (H) (H)	(H) (HL)	([LH]L)	*hēringes > heringes
b.	(H) (HL)	—	([LH]L)	*lāverke > laverke
c.	(HL) (H)	(HL) L	([LL]L)	*ċīcenes > cicenes
d.	(HL) L	—	([LL]L)	*clāvere > clavere

TABLE 46. Metrical structures and trisyllabic shortening.

originally in b. In c, a light syllable is stranded as a result of extrametricality, as was already the case in d. We suggest that it was the preference, on the one hand, to have a branching structure for the main stressed foot, and on the other hand, not to have any stranded final syllables, that led to trisyllabic shortening. In each case, the result of TSS is that all the syllables could be incorporated into a maximally branching foot, where the head could be either [LH] or [LL]. Notice that in disyllabic words, extrametricality would have merely led to the second syllable being incorporated into the initial foot; hence, (H) (H) > (H L). In these cases, there would have been no motivation for vowel shortening.

It should be noted that neither Middle High German nor Middle Dutch show comparable shortening processes. Old High German, in contrast to Old English, retains long vowels in final closed syllables (cf. OHG *habēn* vs. OE *habban*, 'to have'; Braune & Mitzka 1967:56–69; Wright 1906:§57–58). Thus, Old High German heavy final syllables could not have been easily assumed to be light, as is possible for Old English, which in turn led to consonant extrametricality. Further, long vowels in final syllables continue to exist in Middle High German. Thus, there would be no reason for interpreting final consonants as extrametrical, and hence, no reason to introduce a process like trisyllabic shortening into the grammar. Similar considerations hold for Dutch.

6.4. OPEN SYLLABLE LENGTHENING IN MIDDLE ENGLISH. Let us turn now to OSL itself. If trisyllabic shortening is ignored, one could suppose that open syllable lengthening was introduced to make all stressed syllables heavy. But certainly this was not the case for trisyllabic words in Middle English. We suggest that the pressure was not to make the stressed syllable heavy, but rather to make the stressed foot maximal. Relevant patterns are listed in Table 47.

	WITHOUT OSL	AFTER OSL	EXAMPLE
a.	([LL])	([H]L)	tāle
b.	([H]L)	no change	stāne
c.	([LL] L)	no change (TSS)	clavere
d.	([LH] L)	no change (TSS)	laverke

TABLE 47. Middle English metrical patterns, assuming TSS.

As Table 47 shows, the only actual effect of OSL in Middle English is to lengthen the initial syllable of words of type (a), forcing the second syllable into the weak branch of the foot, thereby maximizing the stressed foot. When more than one syllable follows, OSL would result in less optimal patterns: ([LL] L) would become ([H] L) L, resulting in a stranded syllable; ([L H] L) would become ([H]) ([H] L), resulting in a submaximal stressed foot and a dependent foot that is more complex than the head foot. In these cases, however, TSS takes priority, keeping the initial syllable short.

6.5. OPEN SYLLABLE LENGTHENING IN MIDDLE DUTCH AND MIDDLE HIGH GERMAN. Middle Dutch and Middle High German did not undergo consonant extrametricality or trisyllabic shortening; nevertheless, OSL serves in these languages to maximize the

foot, as it does in Middle English.[45] For it appears that syllable extrametricality (SEM), and not consonant extrametricality, was introduced into the continental languages, probably due to the influence of Romance loans (Lahiri et al. 1999:§6.7). If this is correct, then it is clear why in words like Middle Dutch *water*, the initial syllable is lengthened: to be able to have a regular stressed foot (H). But what of words like *weduwe* > *wēduwe*, or *vedere* > *vēdere*? The introduction of SEM has the effect of converting an original maximal foot ([LL] L) into ([LL]) ⟨L⟩. If, as we posited for Middle English, there is a pressure to maximize the main stressed foot, then we can understand OSL as restoring a maximal foot (H L). The set of Middle Dutch metrical patterns before and after OSL is shown in Table 48.

	ORIGINAL	SEM	OSL	EXAMPLE
a.	([LL])	(L) ⟨σ⟩	(H) ⟨σ⟩	dāghe
b.	([LH])	(L) ⟨σ⟩	”	wāter
c.	(HL)	(H) ⟨σ⟩	”	māne
d.	(H) [H]	(H) ⟨σ⟩	”	fōdor
e.	([LL] L)	([LL]) ⟨σ⟩	(HL) ⟨σ⟩	wēduwe
f.	([LL]) [H]	([LL]) ⟨σ⟩	”	
g.	([LH] L)	([LH]) ⟨σ⟩	(H) (H) ⟨σ⟩	cōninᴄe
h.	([LH]) [H]	([LH]) ⟨σ⟩	”	
i.	(H) (HL)	(H) (H) ⟨σ⟩	”	
j.	(H) (H) [H]	(H) (H) ⟨σ⟩	”	
k.	(HL) L	(HL) ⟨σ⟩	(HL) ⟨σ⟩	
l.	(HL) H	(HL) ⟨σ⟩	”	

TABLE 48. Effects of syllable extrametricality (SEM) and OSL in Middle Dutch.

Surveying the patterns in Table 48, we observe that OSL results in an improvement in the structures of a, b, e, and f, and makes no change in c, d, i, j, k, and l. This leaves g and h where ([LH]) ⟨σ⟩ changes to (H) (H) ⟨σ⟩. Supposing that (H) is preferable to the resolved ([LH]), this change, too, results in a better foot. Observe also that this change results in a reduction of the number of metrical patterns, increasing the uniformity of the system.

6.6. SUMMARY. Summing up our observations about changes in foot structure in West Germanic languages, we arrive at the preference scales for foot patterns and principles of interpretation given in Table 49.[46] Common to the different languages discussed above is an attempt to maintain and maximize the Germanic foot amid various changes that threaten to destabilize or minimize it, as well as efforts to avoid unparsed syllables if possible.[47] OSL contributes to these goals in all three languages, though somewhat differently in Middle English than in Middle Dutch and Middle High German.

[45] Here we will look specifically at Dutch, but similar considerations hold for German.

[46] Since TSS applied to the configuration in c also results in a maximal foot, it is difficult to distinguish the effects of the preference for heads not less complex than dependents from those of foot maximization in the cases discussed in a.

These preference scales are reminiscent of devices proposed by Vennemann (1988), and another formalization of preference scales is formulated in OT (Prince & Smolensky 1993). However, there are differences between OT and our scales. For instance, our preferences are not freely rerankable. All things remaining equal, the preferences stay the same, since this ranking reflects principles of Universal Grammar, which are fixed. As to whether the grammar should be described in terms of OT rather than linear derivations, we have not looked at sufficient synchronic interactions to decide how the entire system would work.

[47] Our account here differs from that presented in Dresher & Lahiri (1991:279–282), where it is suggested that OSL arose in response to the increasing opacity of the Germanic Foot and the subsequent loss of Resolution, resulting in a transfer of the two-mora condition from the level of the stressed foot to the level

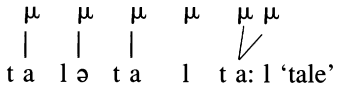
a. Maximization of foot: (Hd Dep) > (Hd)
   ([LH] L) > ([H]) (TSS)
   ([H] L) > ([LL]) (OSL)
b. Maximization of head (including the head of the head)
   ([H]) > ([LH]) > ([L]) (OSL)
c. Heads not less complex than dependents
   ([LH] L) > ([H]) ([H] L) (TSS)
d. Uniform interpretation of similar phenomena
   No weight distinctions in final unstressed syllables implies CEM
   All final syllables unstressed despite quantity differences implies SEM

TABLE 49. Prosodic preference scales and principles of interpretation.

7. OTHER THEORIES OF OSL. All philological treatises and grammatical works on Middle English state that (a) vowels in open syllables were lengthened in early Middle English and (b) when there was a vowel length alternation as in *crādol-cradoles* or *wāter-wateras*, there was levelling out in favor of one or the other form. We have shown that a detailed analysis of developments from Old English on is consistent with these assumptions. There is recent literature, however, which argues that this lengthening is not OSL, but rather lengthening based on deletion or reduction of following syllables. We have shown that these arguments are not empirically grounded; in this section, we demonstrate that they are also not theoretically necessary.

7.1. COMPENSATORY LENGTHENING. Minkova (1982) offers a solution based on the idea of preservation of the weight of the foot: the loss of a mora in the syllable being lost through schwa deletion is compensated by adding a mora to the remaining short vowel, causing lengthening. Lass (1985) proposes a hierarchical account that includes syllable and metrical structure. Hayes (1989) reformulates the process in terms of moraic theory. Hayes's formulation is shown in 8.

(8) Middle English compensatory lengthening (Hayes 1989)



'tale'

The mora formerly attached to the deleted final vowel reassociates to the stem vowel, causing lengthening. This example is notable among those discussed by Hayes because the delinked mora flips over the final consonant. What is not adequately explained is why the mora does not associate to the final consonant, which in other circumstances would count as moraic in this position. Thus, a derived word **tal* would qualify as a minimal word, just like *hwæl* 'whale' or *hol* 'hole'. Since major class words of the form CV are excluded in Old English, whereas CV: and CVC are permitted, it is plausible to suppose that final consonants in words like *hol* are moraic.

Kim (1993) notes several problems with Minkova's analysis. First, she disputes the dating of schwa loss as being prior to or simultaneous with OSL. Second, she observes that Minkova does not look at English dialects, some of which have more lengthening

of the stressed syllable. Though OSL has the effect of abolishing Resolution in Dutch and German, its interaction with TSS in Middle English suggests rather that Resolution remains an active force in Middle English, as argued above.

than Standard English, nor at German and Dutch, which also had OSL. Third, she points out that the environment for lengthening is not precisely stated; thus, Minkova's analysis cannot account for lengthening in *hazel* and *even*, for example, or for *feast* (from *feste*).

Kim proposes that it is sufficient for the posttonic vowel to be weakened to schwa to trigger OSL. 'In this sense, MEOSL is a lengthening process which started to compensate for the overlight weight of the final syllable which was weakened to schwa due to the increasing concentration of the main stress upon the first syllable of the word'. (1993:272). According to Kim, this analysis accounts for the general failure of OSL in *-ig* words, whose final vowel did not weaken to schwa. It also predicts the general application of OSL in disyllables, which also had weakening to schwa (*maple*, *cradle*, etc.). Kim claims that the same conditions on OSL hold in Middle High German and Middle Dutch.

Against this hypothesis, we observe that it neglects to account for why English disyllables show so many 'exceptions' to OSL, though it would be expected to apply whenever there was a schwa in the second syllable. It can hardly be the case that, say, *later* and *latter* or *even* and *heaven* differed with respect to the quality or quantity of the second syllable. Rather, these differences can be explained in terms of the analysis we have offered here, without appealing to a distinction between reduced and unreduced vowels in any of the languages surveyed.

Ritt (1994) attempts to unify the various Middle English quantity changes, including OSL, TSS, and some other changes, in one probabilistic formula which he states in words as in 9.

(9) Middle English Quantity Adjustment (Ritt 1994: 75, 95–96)
The probability of vowel lengthening was proportional to
a. the (degree of) stress on it
b. its backness
c. coda sonority
and inversely proportional to
a. its height
b. syllable weight
c. the overall weight of the weak syllables in the foot.
The probability of vowel shortening is inversely proportional to the probability of lengthening.

Ritt argues that a probabilistic analysis is more adequate in the face of the variable results of lengthening and shortening as measured by Modern English reflexes. Against this approach, we have argued throughout that this variability is largely due to the effects of levelling, and is not a direct reflection of the limits of Middle English lengthening or shortening. This is not to say that there may not be aspects of Middle English quantity changes that applied variably, or inconsistently; however, it remains to be shown that a variable residue remains even after the effects of levelling are accounted for.

Drawing on Minkova 1982 and Minkova & Stockwell 1996, Bermúdez-Otero argues that there were no processes of OSL and TSS in Middle English. Rather, he proposes (1998:176) that 'the compensatory interpretation of MEOSL is correct in essence', accounting for lengthening in words like *tale* which lost a final schwa. To account for the unpredictable lengthening in monosyllabic *a*-nouns, Bermúdez-Otero posits that underlying monosyllables with long vowels were more harmonic (i.e. better satisfied the constraint hierarchy) than monosyllables with short vowels, and that this preference

provided a pressure for words of the *whale* type to change from having short vowels to long vowels by a process of lexical diffusion.

Bermúdez-Otero (1998:177) posits a third mechanism for lengthening in sonorant-final disyllabic stems like *cradle* and *raven*. He suggests that the second syllable in such forms was variably pronounced with either a schwa ([ravən]) or a syllabic sonorant ([ravn̩]). If 'through an accident of performance' a listener perceived a stimulus [ra:vn̩], the listener's grammar 'may allow [ra:vn̩] to be parsed as a well-formed realization of the lexical item /ravən/ . . . the tonic vowel is seen to have attracted the mora delinked from the underlying schwa'.[48]

This analysis is quite problematic in several ways. First, it relies entirely on performance accidents to generate the lengthened vowels in this class of forms; as we have seen, long vowel outcomes are found in over 40% of disyllabic stems by our count, and we would need an explanation for why there were so many performance errors in just this class. Second, it is not clear in what way the lengthening can be said to be due to the mora unlinked from the underlying schwa when a syllabic sonorant occupies the syllable nucleus in place of the schwa. On Bermúdez-Otero's own account, /ravən/ has two moras, whether the second syllable has a schwa or a syllabic sonorant, but [ra:vən] or [ra:vn̩] has three moras. This situation is thus incompatible with his own assumption that 'ME grammar forbade lengthening through mora-insertion, but allowed lengthening through mora-transfer' (1998:176).

Even if this account can be made to work, we observe that Bermúdez-Otero posits three separate mechanisms to account for vowel lengthening in Middle English: compensatory lengthening in words of the *tale* class, which applies regularly; sporadic restructuring of underlying forms in words of the *whale* class due to an assumed preference for underlying long stem vowels; and some form of mora transfer driven by performance errors in the *raven* class. By contrast, our analysis posits a single source of lengthening in these classes—OSL—and a single cause for the unpredictable reflexes of vowel length in Modern English—the total levelling of length alternations within inflectional paradigms. Finally, Bermúdez-Otero's theory does not account for the shortening of original long vowels in disyllabic words. On our account, variable outcomes are predicted in this class because of the interaction of OSL and TSS, a prediction that is borne out by the evidence.

7.2. OSL AND PREFERRED FOOT TYPES. To our knowledge, Lass (1985) is the first to suggest that MEOSL results in a better foot type than that which characterizes pre-MEOSL forms.[49] Lass posits the preference scale in 10:

(10) Preference scale of foot types (Lass 1985:258)[50]
(H) > (L L), (H L) > (L L L) > (H L L)

Following Minkova, Lass assumes that OSL replaces *tălə* by *tāl*, hence (H) > (L L). We have seen, however, that MEOSL does not involve the loss of a syllable, and that

[48] Jones (1989:118) comes to the exact opposite conclusion, viz. that when the coda of the second syllable is a sonorant, lengthening is blocked.

[49] When discussing factors that may influence lengthening in Middle English, Jones (1989:117) mentions that not just syllables, but combinations of syllables can have 'preferred length characteristic', but he does not specifically connect this observation with foot structure.

[50] We have simplified Lass's multitiered syllable and foot structures, but the representations in 10 suffice for purposes of the present discussion.

the tendency to maximize the Germanic foot and the activity of TSS are not consistent with other aspects of the hierarchy in 10.

Minkova (1985) takes up Lass's idea that MEOSL leads to improved foot structure: the loss of a final schwa leads to a dispreferred CVC monosyllabic foot; a better CV:C foot is created by OSL. Minkova's preference scale for metrical feet is given in 11.

(11) Preference scale of foot types (Minkova 1985)
   a. (S W (W)) > (σ)
   b. Monosyllables: (VV), (VVC), (VCC), (VVCC) > (VC) > (V)

Minkova proposes that the optimal foot is (S W (W)): she argues, correctly we think, that OSL does not apply in trisyllables because such structures are 'well-balanced' already. She does not specify, however, what sort of syllables may fill the various positions of this structure. We have seen that the specific composition of such feet matters quite a lot: (LLL) is a possible foot, but (HLL) is not; (HL) is maximal, but (LL) is not.

Another difference in our approaches is that Minkova supports her scale by pointing to various processes and tendencies drawn from widely separated periods of English, whereas we prefer to focus on the details of the interactions between processes going on at a specific period. It is one thing to assert, for example, that there is a tendency in English, or Germanic, or language in general, to make a stressed vowel heavy, and to adduce instances where this occurs. On our view, a true explanation should seek to understand the local conditions in which such a lengthening in fact occurs, and why stressed light syllables can nevertheless persist for hundreds of years.

Finally, we observe that in contrast to her account in Minkova 1982, the theory of MEOSL proposed in Minkova 1985 no longer requires any connection between OSL and the loss of a mora. On the one hand, if OSL is viewed as a compensatory process, as in Minkova 1982, such a connection is necessary (though incorrect on empirical grounds). If, on the other hand, OSL is a strategy for creating more optimal prosodic structures, as in Minkova 1985, then there is no reason for it to be limited to cases where a mora is lost. In this spirit, we have argued that CV:CV(C) makes a better foot than CVCV(C) at the relevant stage of Middle English. Conversely, if OSL is improving words that would have the form CVC after schwa loss, we might expect vowel lengthening to apply to all such monosyllables; however, it does not.

We conclude that, in addition to the empirical evidence which shows that OSL is open syllable lengthening, there is no compelling theoretical reason to suppose a connection between OSL and mora loss.[51] The solution proposed in §6 is similar in spirit to some

[51] Leys (1975:424–25) provides yet another explanation, claiming that in the older stages of Middle Dutch and Middle High German morphological structure had dominance over phonological syllable structure. At an older stage, Dutch words like *daga* and *biddan* were syllabified *dag-a* and *bidd-an*. Later, phonological syllabification took precedence, and the words were syllabified *da-ga* and *bid-dan*. Following Prokosch's (1939) explanation that OSL came about to standardize quantity, Leys argues that a short vowel in an open syllable is unnatural and marked, and this situation was corrected by OSL in these languages. The problem with this explanation is that there is no clear evidence that short-stem words like *daga* are syllabified as *dag-a* in the older stages of the West Germanic languages. Morphemic syllabification fails to explain other phonological processes like high vowel deletion (cf. Dresher & Lahiri, 1991) or gemination (Lahiri 1982). There would be no difference between words like *word-u* and *lof-u*, although [u] deletes only in the former. Although there are only a very few words attested in Old Dutch, the nominative plurals of neuter *a*-nouns like *wort* do not have a final [u], as compared to *facu* (van Bree 1977:350). Similar arguments hold for gemination. If morphemic syllabification was dominant, then many of the metrically sensitive processes could not have taken place.

of the ones discussed above, despite differences in interpretation of the facts. The principles in Table 49 are based on a study that locates OSL in the context of other synchronic and diachronic prosodic processes taking place in Middle English, as well as in the other West Germanic languages.

8. CONCLUSION. We have argued that OSL was once part of the grammar of Middle English, Middle Dutch, and Middle High German. This in itself appears to be a trivial claim since lengthening in open syllables has been generally assumed to be part of the medieval period of all the West Germanic languages. We have tried to show that although the basic motivation of the lengthening is the same, its outcome depends on the local contexts. We demonstrate that this is due to the interaction of other processes in the individual languages. To our knowledge, no earlier attempt has been made to establish the similarities and differences of the lengthening process in all three languages. Our proposal differs from earlier approaches because we maintain that it is not just the case that OSL led to an improved or less marked metrical pattern in the medieval languages but that this lengthening could not have taken place in earlier times. In fact, we claim that the shared reason for OSL was an endeavor to maintain and maximize the Germanic foot, which was present from the oldest stages of the Germanic languages. OSL did not fundamentally change the earlier foot structure; rather, it contributed in different ways in the three languages to sustain the metrical pattern of the Germanic foot, in spite of other contradictory changes.

APPENDIX 1: SURVEY OF OLD ENGLISH MORPHOLOGICAL CATEGORIES

CLASS	ENDINGS	STEM	SINGULAR	PLURAL	GLOSS
a- (m.)	Ø - VC	C_0VC	dæg	dagas	'day'
			hwæl	hwalas	'whale'
		$C_0V:C$	stān	stānas	'stone'
		C_0VCVC_1	cyning	cyningas	'king'
			hamor	hamoras	'hammer'
			cradol	crad(e)las	'cradle'
		$C_0V:CVC_1$	dēofol	dēoflas	'devil'
			hǣring	hǣringas	'herring'
a- (n.)	Ø - V	C_0VC	hol	holu	'hole'
	Ø - Ø	C_0VCC	word	word	'word'
		C_0VCVC_1	wæter	wæter	'water'
		$C_0V:CVC_1$	fōdor	fōdor	'fodder'
ja- (n.)	V - V	C_0VCC	stucce	stuccu	'stick'
	Ø - Ø	C_0VCC	bedd	bedd	'bed'
u-	V - V	C_0VC	sunu	suna	'son'
			wudu	wuda	'wood'
	Ø - V	C_0VCC	feld	felda	'field'
		C_0VCVC_1	sumor	sumora	'summer'
ō-	V - V	C_0VC	talu	tala	'tale'
			scinu	scina	'shin'
	Ø - V	$C_0V:C$	brōd	brōda	'bread'
		C_0VCC	eln	elna	'ell'
n-	V - VC	C_0VC	nama	naman	'name'
		C_0VCC	sunne	sunnan	'sun'
		$C_0V:C$	mōna	mōnan	'moon'
		C_0VCVC_1	wuduwe	wuduwan	'widow'

APPENDIX 2: SUMMARY OF NOMINAL ENDINGS IN EARLY MIDDLE DUTCH (BEFORE OSL)

	ENDINGS	STEM	SINGULAR	PLURAL	GLOSS
(a)	Ø - Ø	C_0VCC	licht	licht	'light'
		C_0VCVC_1	wapen	wapen	'weapon'
		$C_0V{:}CVC_1$	voeder	voeder	'fodder'
		$C_0V{:}C$	brōt	brōt	'bread'
(b)	Ø - V	C_0VC	dach	daghe	'day'
			hol	hole	'hole'
		$C_0V{:}C$	steen	steene	'stone'
		C_0VCVC_1	sadel	sadele	'saddle'
(c)	V - V	C_0VC	tale	tale	'tale'
			sone	sone	'son'
		$C_0V{:}C$	māne	māne	'moon'
		C_0VCC	stucce	stucce	'stick'
			bedde	bedde	'bed'
		C_0VCVC_1	weduwe	weduwe	'widow'

APPENDIX 3: MORE OLD ENGLISH *A*-NOUNS AND DUTCH REFLEXES

MIDDLE DUTCH	DUTCH		NL LENGTH	OLD ENGLISH	GLOSS
blat	blad	bla:deren	A	blæd	'leaf'
dac	dak	da:ken	A	þæc	'roof'
dal	dal	da:len	A	dæl	'valley'
gat	gat	ga:ten	A	geat	'hole'
ghebet	gebed	gebe:den	A	(ge-)bed	'prayer'
ghebot	gebod	gebo:den	A	(ge-)bod	'command'
ghebrec	gebrek	gebre:ken	A	(ge-)brec	'lack'
(ge-)lach	gelag	gela:gen	A	(ge-)læg	'expense'
met-	gemet	geme:ten	A	(gi-)met	'a measure'
glas	glas	gla:zen	A	glæs	'glass'
hof	hof	ho:ven	A	hof	'courtyard'
lit, let	lid	le:den	A	liþ	'limb'
lot	lot	lo:ten	A	hlot	'fate'
pat	pad	pa:den	A	pæþ	'path'
scip scep	schip	sche:pen	A	scip	'ship'
scot scōtes	schot	scho:ten	A	sc(e)ot	'shot'
vat	vat	va:ten	A	fæt	'cask'
wech	weg	we:gen	A	weg	'road'
klippe	klip	klippen	S	clif	'cliff'
joc jockes	juk	jukken	S	geoc	'yoke'
sap sāpes	sap	sappen	A > S	sæp	'juice'
spor spōr	spoor	spo:ren	A > L	spor	'track'
	weerwolf		A > L?	wer	'wer(wolf)'

A = Dutch reflex alternates in length, S = short vowel only, L = long vowel only

APPENDIX 4: FURTHER OLD ENGLISH WORDS WITH DISYLLABLES THROUGHOUT THE PARADIGM

a. STEM VOWEL /a/: ealu(ɖ) 'ale', b(e)alu 'bale', bana 'bane', c(e)aru 'care', draca 'drake', faru 'fare', fæs(u) 'feaze', gære 'gear', grafu 'grave', haca 'hake', 'hook', hama 'hame', hara 'hare', cnafa 'knave', lagu 'lake', lane 'lane', (ge)maca 'make' (n. dial., OED), manu 'mane', maga 'maw', nafu 'nave' (of wheel), plæce 'place', racu 'rake', sacu 'sake', sala 'sale', sagu 'saw', scealu 'scale', sc(e)aþa 'scathe' (arch., dial., ODEE), sceadu 'shade', 'shadow', scealu 'shale' (obs. dial. OED), scamu 'shame', slaga 'slayer', swaþu 'swath', 'swathe', fana 'vane', walu 'wale' (dial. OED), waru 'ware'

b. STEM VOWEL /e/: bera 'bear', bece 'beck', cleofa, clifa 'cleve', denu, -e 'dean', hege 'hedge', 'hay' (dial. arch.), mete 'meat', medu 'mead', me(o)lu 'meal', mere 'mere', nefa 'nephew', peose, pise 'pea(se)', plega 'play', stede 'stead', 'steed' (dial.), stela 'steal', 'stell' (both dial, ODEE), þreve 'thrave', 'threave', wela 'weal'

c. STEM VOWEL /o/: bola 'bole', 'boal', boga 'bow', clofa 'clove', cote 'cote', coþu, -e 'cothe' (dial.), cofa 'cove', duru 'door', dora 'dor(r)', dropa 'drop', hola 'hole', hosa 'hose', loca 'loke', 'loce', more 'more', scolu 'shoal', scota 'shote', 'shoat', þole 'thole'

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