Trisyllabic shortening in English: past and present[1]

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The harmony of a language depends, in a great measure, on a just observation of the quantities.

> From John Burn's *A pronouncing dictionary of the English language* (1786)

Accent, therefore, seems to be regulated, in a great measure, by etymology.

> From John Walker's *Critical pronouncing dictionary* (1791)

Trisyllabic shortening or TSS is one of the most controversial processes in the history of English. Time after time, claims have been made about quantity variations, attributing them either to trisyllabic shortening, closed syllable shortening, or other mechanisms. Our examination of the nature of TSS in the history of English leads us to conclude that it differs from closed syllable shortening, which is syllable based, and that the preference for a maximal foot has remained the underlying incentive for maintaining vowel quantity variations throughout the centuries. However, the prosodic system has undergone dramatic changes and many features of TSS in the older and modern stages are not the same. Older TSS affected mostly inflected native words, while in Modern English, TSS causes alternations in derivationally related words with Romance suffixes. Interacting with open syllable lengthening, older TSS led to quantity alternations in inflectional paradigms which were later levelled out. Romance loans, both suffixed and nonsuffixed forms, were borrowed in their entirety and constrained by the prosodic structure of the language. Only later, when these words came to be derivationally related, were quantity alternations observable with TSS operating as a constraint dictated by the prosodic structure of the modern language. Thus, throughout the history of English, TSS has served the same purpose: it led to the preferred prosodic structure of the word.

1 Introduction

English has seen a number of shortening rules throughout its history. One of the most troublesome and questionable processes of shortening is known as trisyllabic shortening (TSS), where the vowel in a stressed syllable is shortened if two syllables follow, as in *sincēre–sincĕrity*. A controversial issue is whether TSS in late Old English is the same as in Modern English. Older TSS mostly affected inflected words

causing quantity alternations in inflectional paradigms, while in Modern English, TSS leads to alternations in derivationally related words. The early application of TSS affected native and non-native words, while Present-day TSS causes quantity alternations in words with certain Romance suffixes. A further controversy is whether TSS is a form of closed syllable shortening, which has triggered alternations like *keep–kept*.

Our goal is to shed light on the motivations of such quantity changes. To this end we will re-examine the characteristics of TSS in the older periods of the language and compare it with shortening in Present-day English. To accomplish this we briefly look at comparative evidence from Dutch, German, and English, particularly with reference to (a) the processes of TSS and open syllable lengthening (OSL), (b) the incorporation of loans, (c) the presence and absence of analogical levelling, and (d) the role of language acquisition. Our claim is that although TSS in the older stages is superficially different from TSS in Modern English, it served the same goal of optimizing the prosodic structure. This is because, although the preference for a maximal foot has remained the underlying cause for vowel shortening throughout the centuries, the prosodic system itself has undergone dramatic changes. Further, we claim that although TSS and CSS cause shortening, the former is foot based while the latter affects syllable structure.

The paper is organized as follows. We first review different analyses of TSS in early English (section 2). In section 2.1 we discuss the possible relationship between TSS and other shortening processes, in section 2.2 the possible relationship between TSS and secondary stress, and then in section 2.3 we review the literature on the incorporation of Romance loans in Middle English and discuss the role of TSS. In section 3 we turn to the interaction of TSS and OSL and motivate these processes in section 4 defending our main claim that both shortening and lengthening processes improve the prosodic structure of words. Sections 5 and 6 discuss the source of vowel length alternations in Modern English. In section 5 we discuss TSS in regular alternations, supporting in section 5.1 our claim that the prosodic structure acted as a constraint on how words were borrowed, and reviewing previous analyses of these alternations in Modern English in section 5.2. In section 6 we turn to the puzzling cases of 'medial laxing', introducing the problem in section 6.1. Forms with nonproductive Romance suffixes triggering TSS are discussed in section 6.2, while section 6.3 discusses productive Romance suffixes. Section 6.4 relates the analysis of tensing of the base to what is called 'medial laxing' in Modern English. Finally, section 7 summarizes the conclusions.

2   TSS in Old English and Middle English

2.1   *TSS and other shortening processes in Old English*

TSS was present in Old English (Hogg, 1992: §5.199–5.201) and was evidently still active in Middle English (Campbell, 1959: §329; Wright & Wright, 1928: §88;

Jordan, 1974: §24; Luick, 1898, 1907, 1914/1964: §§204–7, §352; Wyld, 1927: §176, and others).[2] The usual description of the process is that in a three-syllable word, the vowel of the first stressed syllable was shortened. In the early stages TSS applied when the long vowel was followed by two consonants or a geminate, i.e. in closed syllables; later the process also affected long vowels before single consonants, i.e. in open syllables (Luick, 1914/1964: §204, §353). This shortening occurred primarily in inflected forms, although there are examples with derivational suffixes which did not bear secondary stress, as in *sūð* 'south' – *sŭðerne* 'southern', and later in words which were no longer regarded as compounds: *hālig* 'holy' – *hăligdæġ* 'holiday'. Consequently, TSS accounted for the short vowel in the plural of disyllabic nouns where the nominative singular had a long vowel. The following examples illustrate the alternations:

(1) TSS in late Old English

Singular	*Plural*	
cīcen	cĭcenu	'chicken'
hēafod	hĕafodu	'head'
ǣnig	ǣnige	'any'
clōver	clăvere	'clover'
hǣring	hǣringas	'herring'

Another shortening process in Old English was closed syllable shortening (CSS) (Luick, 1914/1964: §204, 352).[3] According to Luick, at the early stages CSS occurred when a long vowel was followed by three consonants, as in *brĕmblas* from **brēmblas* 'brambles'. Later, CSS also applied if the long vowel was followed by two consonants as in *ĕnlefan* from **ǣnlefan* 'eleven'.[4]

Luick (1898, 1907) pointed out that sometimes the relationship between TSS and CSS in Old English and Middle English is mistakenly linked to the syncope of the medial vowel in trisyllabic forms which supposedly created the environment for CSS. Luick gave several arguments against this position. First, shortening also frequently occurred without syncope, as in *wǣpn > weapon*, and *dēofol > devil* (**wǣpnes* and **dĕoflas*[5] do not occur), *hăligdom* 'sanctity', and in names as *Whĭtaker*, *Lĭnaker*, and *Bĕverly* (< OE *Bēoforlic*). Second, syncope could have

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[2] Recently, the existence of TSS in Old English has been called into question by Minkova & Stockwell (1996) and Bermúdez-Otero (1998). We will come back to their views in section 5.1 and section 3.3 respectively.

[3] A reviewer mentions, quoting Lass (1992: 71–3), that Luick gave four different rules: an early TSS rule, an early CSS rule, a later TSS rule and a later CSS rule. We think that this is Lass's interpretation of what Luick said. According to Luick there were quantity adjustments in two periods. These adjustments took place in the two environments mentioned above. He did not claim that there were four distinct rules. Rather, quantity requirements led to the changes ('indem ein gewisses Übermaß an Länge vermindert wurde' [by reducing too much length: AL/PF] §203), which occurred twice in the history of English.

[4] The examples are not plentiful, particularly not the ones with three consonants.

[5] Richard Hogg (p.c.) mentioned that *deoflas* occurs once in Old English (at MtGl (Ru) 1.39), and that in late texts the form *deoflan* is also found. However, whether it occurred with a short vowel is uncertain, and is a matter of dispute.

Table 1. *Syncope of medial syllable in words with a closed initial syllable*

Old English	Middle English	Modern English
webbestre		Webster
loppestre		lobster
Gloucester		Glŏster
Leicester		Lĕster
	fantesie	fancy
	curte(i)sie	curtsy
	martinet	martlet
	perseli	parsley
	partener	partner
	vintener	vintner
	perchemin	parchment

resulted in syllabic consonants, as in *sūðerne > sūðr̩ne* 'southern', not creating the right environment for CSS, leading nevertheless to a short vowel as in *sŭðr̩ne*. Third, syncope often occurred when there was a closed initial syllable in a trisyllabic word, where there was no vowel to shorten, as in the words in table 1 (Luick, 1898: 339, 351). Finally, syncope also frequently occurred in the form of deletion of high vowels as in the past tense of long-stem weak verbs, as in **dēmide > dēmde* 'to judge', **cēlide > cēlde* 'to cool' (Lahiri, 1998). Again, the vowel did not shorten.

Although both TSS and CSS caused vowel shortening, several scholars, including Luick, implicitly consider these to be independent processes in English since the contexts did not coincide (Wright & Wright, 1928; Hogg, 1992: 211–12; Chomsky & Halle, 1968: 241, but see pp. 183 and 334; Ritt, 1994: 95). Luick assumed that the processes were related only because they are different means of adjusting quantity. Historical evidence suggests that these processes entered the grammar of English at different periods – TSS became active in the language in 1100, while CSS was already found around 1000 (cf. Chomsky & Halle, 1968: 253–4), or possibly even earlier (cf. Luick, 1914/1964: §207).

In Kiparsky (1968 [1982a: 21–2]), however, these processes were treated as one since part of the context in which they applied was identical. In Old English vowels were shortened before three or more consonants or in the third syllable from the end of a word if followed by at least two consonants, as described by the rule given in (2).

(2) TSS and CSS in Old English (Kiparsky, 1968)

$$V \rightarrow [\text{-long}] / \underline{\quad} CC \begin{cases} C \\ \ldots V \ldots V \end{cases}$$

Kiparsky's strongest motivation for collapsing TSS and CSS is that when the rule in (2) changed to the less restrictive one in (3), where the environment for shortening contained one consonant less, it affected both TSS and CSS simultaneously. This led

him to assume that the two processes were related in the earlier as well as in the later stages.[6]

(3) TSS and CSS in Modern English (Kiparsky, 1968)

$$V \rightarrow [\text{-long}] / \text{---} C \begin{cases} C \\ \dots V \dots V \end{cases}$$

As we will see in section 6, most analyses follow Kiparsky in assuming that TSS in Modern English is a form of CSS. However, as we have seen above, this was not commonly assumed to hold for the older stages of the language, and our claim (as spelt out in section 6) is that even in Modern English, TSS and CSS are separate.

2.2   TSS and secondary stress

Although there are a number of studies which directly link TSS to secondary stress, the correlation between the two is not obvious. We find three approaches to this issue discussed in the literature. Luick (1907) explicitly drew a relationship between TSS and secondary stress in derived and underived words, both in Germanic and in Romance loans. Some scholars only assume such a relationship for compounds and derived words with heavy suffixes (cf. Wright & Wright, 1928: §98), yet others only for Romance loans (cf. Heck, 1906; Eckhardt, 1936). There are also contradictory opinions regarding the influence of secondary stress. While Luick claimed that it was the lack or loss of secondary stress which led to TSS, most others have argued that the presence of secondary stress triggered shortening. In the following paragraphs we discuss these different proposals in more detail.

   Luick argued that TSS took place when a stressed long vowel was followed by two unstressed syllables. That is, trisyllabic words with secondary stress could only undergo TSS when they lost this stress. More explicitly he stated that only '"phonetisch einfache" Formen' ['phonetically simple' forms: AL/PF] underwent TSS (Luick, 1914/1964: 328), i.e. 'eine von einem accent beherrschte Silbengruppe' [a group of syllables governed by one accent: AL/PF] (Luick, 1898: 339), or words where the stressed syllable was followed by two unstressed ones which form 'einen Sprechtakt' [one speech unit: AL/PF] (Luick, 1907: 8), which we interpret to be a foot. Thus, trisyllabic forms with only initial stress preferred to have a short stressed syllable, as shown in (1) and in the following examples:

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[6] Kiparsky (1968) conflates CSS and TSS in a single rule to defend the brace notation of early generative grammar. If we take this literally, and assume that at a later stage another consonant is deleted from the environment, the contexts would have nothing in common:

$$\begin{cases} \text{---} C \\ \text{---} \dots V \dots V \end{cases}$$

The three-consonant environment in (2), as we see from Luick's examples, does not seem to be significantly different from the two-consonant environment in (3). Both are invariably split into one coda consonant followed by an onset, i.e. an onset cluster or a singleton onset. Insofar as syllable structure is concerned, there is no difference between *brĕmblas* and *ĕnlefan*.

(4) Loss of secondary stress triggering TSS in native words (cf. Luick, 1914/1964)

ǽrènde	>	ě́rende	'errand'
sū́ðèrne	>	sū́ðerne	'southern'
lā́fèrce	>	lǎ́ferce	'lark'
dě́orlìngas	>	dě́orlingas	'darling-PL'
frḗondscìpe	>	frě́ondscipe	'friendship'

Those who claim that TSS was triggered by heavy endings and/or additional stress(es) in the word argue that these weakened the stress of the antepenultimate syllable and subsequently shortened the vowel as in *scŏ́lére < scŏ́lere 'scholar' (Kluge, 1891; Morsbach, 1896: §53; Bülbring, 1902: §§334, 349; Jespersen, 1928). When main stress apparently reverted back to the antepenultimate syllable as in scŏ́lere, its vowel remained short. Luick strongly protested against this proposal, arguing convincingly that the main stress never shifted rightwards to a heavy ending; rather, both syllables were stressed and the shortening of the initial vowel occurred once the secondary stress was lost. Moreover, heavy endings *per se* did not guarantee shortening as in OE *hlāford* > ME *lōverd* 'lord' where the length was retained.

2.3   TSS and Romance loans

The discussion around the relationship between TSS and secondary stress also extends to Romance loans. Although the existence of secondary stress in native words in early Middle English is controversial (cf. Dobson, 1968), there appears to be a consensus that Romance loans entered the language with some degree of secondary stress. However, there is considerable dispute both as to where the secondary stress was located and what consequences it had for shortening and lengthening. In every discussion of Romance loans, disyllabic words are crucial since their inflected forms would be trisyllabic and, depending on the length of the stressed vowel, vulnerable to TSS. In the following discussion, we summarize the views on the incorporation of both disyllabic and trisyllabic loans.

According to Luick many words were borrowed from French with secondary stress. Initial stressed open syllables of disyllabic loans usually remained long, independent of whether secondary stress remained or was lost, as in *basin* and *moment.* The situation for trisyllabic words was different. In particular, those words with secondary stress on the final syllable could retain it, as in *ívorỳ* and *náperỳ*, the initial vowel being long and secondary stress blocking TSS.[7] However, when the secondary stress was lost, the initial stressed vowel in trisyllabic words was usually shortened, as shown in the examples in (5):

(5) Loss of secondary stress triggering TSS in loans (following Luick, 1914/1964)

lǎ́vender	'lavender'
hŏ́noure(n)	'honour'

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[7] Luick (1907: 49) gave an alternative explanation for words with an initial *i*. This vowel was originally diphthongized. It could in principle shorten under loss of secondary stress, but since the language did not have any short diphthongs, it remained as it was.

gǎllounes   'gallons'
bǔtounes   'buttons'

Thus, according to Luick disyllabic words tended to have long vowels in open syllables, while initial stressed vowels in trisyllabic words with one stress were usually short.

A further consideration regarding shortening is the issue of open syllable lengthening (OSL), which was introduced in early Middle English, affecting both native and loan words (Lahiri & Dresher, in press; see section 3 below for a detailed review). Therefore, open stressed syllables in disyllabic words are expected to have a long vowel; the question is whether OSL was blocked because of secondary stress. As has been noted by many scholars and discussed in detail by Bliss (1952), disyllabic Romance loans are found with both long and short stressed initial vowels. Luick argued that the initial vowel should have been lengthened in disyllabic words independent of secondary stress. Some disyllabic words, like *barrel*, nevertheless ended up with a short vowel. According to Luick, these words could not have had a secondary stress, because this would have given rise to a long vowel. He gave two possible explanations for the short vowels in such disyllabic words: (a) either it was due to the continental pronunciation by learned people, or (b) it was due to levelling on the basis of the inflected trisyllabic forms. We will argue in favour of this latter explanation in section 3.

Contrary to Luick, Eckhardt (1936) suggests that vowel shortening in French loans is caused by the presence of secondary stress, especially in disyllabic words (cf. Eliason, 1939). Eckhardt assumes that disyllabic French loans with final stress were immediately borrowed into the English language with a short initial stressed vowel, followed by a secondary stressed syllable (ⴜx̀), where the secondary stress was lost in Modern English. Disyllabic words with a long initial vowel are exceptional in his approach. They lost the secondary stress very early, which presumably triggered vowel lengthening; alternatively, the vowel could have been lengthened by analogy, as in *pure–purity*. Although Eckhardt is not very explicit about how trisyllabic French loans were originally borrowed, it seems that he assumes that they came in as ⴜxx̀. Subsequently, the final stress disappeared, resulting in ⴜxx, where the medial vowel could get lost, resulting in ⴜx, as in *remnant* < F. *remenant*, *chaplain* < F. *chapelain*. According to him, trisyllabic words with an initial long vowel are exceptional, and may occur in the following instances: (a) if the vowel is immediately followed by another vowel as in *diagram*; (b) if there is a hiatus in the second syllable as in *helium, geranium*; (c) if the vowel corresponds to French *u* as in *funeral*; and (d) by folk etymology as in *savoury*.

Thus, while Luick argued that the loss of secondary stress triggered vowel shortening in trisyllabic words, whereas disyllabic words underwent vowel lengthening independently of secondary stress, Eckhardt suggests that the presence of secondary stress caused vowels to remain short in both disyllabic and trisyllabic words.

According to Bliss (1952) vowel length in Middle English was taken over from

Anglo-Norman, which he claimed still had a vowel-length distinction (pp. 164–87). Thus, the quantity of the initial stressed vowel in disyllabic loans in Middle English directly reflects the quantity in Anglo-Norman. However, later in the same paper (pp. 194 ff.) when discussing the lack of lengthening in some disyllabic words, both native and loans, Bliss argues that OSL should have applied whenever the context was appropriate, but could have been blocked due to segmental environments. He disagrees with Luick and others that stress played any role in the lengthening or shortening processes. Although he does not specifically address shortening in trisyllabic words, he brushes aside Luick's assumption that the lack of length in open syllables could have been related to analogical levelling. We will discuss the role of levelling in such cases in section 3.

Besides Bliss, Heck[8] (1906), Metzger (1908) and Jespersen (1928) also seem to have assumed that languages adopt the vowel length of the language from which they borrow. This view was questioned in Luick (1907: 33–8).[9] Compare for instance the following words:

(6) Mismatch in vowel length in Latin loans into English

VV in English	V in Latin
savour (1225)[10]	săpor
labour (1300)	lăbor
odour (1300)	ŏdor
favour (1340)	făvor
vapour (Chaucer)	văpor
vacant (1300)	văcans
regent (1412)	rĕgens
parent (1413)	părens
decent (1495)	dĕcens
Hebrew (1225)	Hĕbraeus
tyrant (1300)	tўrannus
libel (1382)	lībellus
patron (14th C)	pătronus

Many Latin short stressed vowels have long stressed counterparts in disyllabic English words (cf. Danielsson, 1948: 37). However, in trisyllabic loan words we often find short vowels in English corresponding to long ones in Latin (p. 38), as in *vanity* (1230), *quality* (1290), *diligent* (1340), *evident* (1382), *natural* (1300), *president* (fourteenth century), *eloquent* (1383), *elegant* (1485), *radical* (fourteenth century), *criminal* (1430). That this cannot be explained away by assuming a French origin is clear when words like *ominous* (1592) from Latin *ōminosus* are taken into considera-

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[8] Heck suggests that words borrowed from French all had short vowels, and that those that were borrowed from Latin took over the Latin vowel length (Heck, 1906: 237). But many French words were influenced by Latin, making the whole issue of vowel length obscure.

[9] This view is also expressed in Minkova & Stockwell (1996).

[10] Unless stated otherwise, here as elsewhere, the date denotes the first occurrence of a word according to the *OED*. Using the *OED* as an indication of a word's first occurrence is not entirely unproblematic: a word *may* have occurred earlier than noted by the *OED*. However, we believe that the general picture does not change.

tion, where the French word *omineux* is only reported for the first time in the seventeenth century (p. 38).

In conclusion, there seems to be more agreement on length in trisyllabic loans, which most assumed to have been short, although for different reasons. However, there is a lot of disagreement about the length of vowels in disyllabic loans. This will be discussed in section 3.

2.4   Summary

None of the scholars explicitly assume that TSS and CSS are the same process in Old English. For instance, Luick argues that TSS and CSS both apply to optimize the prosodic system. He explicitly does not adopt the view that TSS is a form of CSS.

With respect to the influence of secondary stress Luick further argues that there is a clear relationship between secondary stress and TSS: initial long vowels in trisyllabic words, whether native or borrowed, monomorphemic or compounds, underwent TSS when there was no secondary stress. That is, the presence of secondary stress blocked TSS. It is however unclear whether native words (other than compounds) had any secondary stress, and if they had any, when it was lost (cf. Dobson, 1968). With respect to French loans, the evidence for ever assuming a stage with secondary stress, especially for disyllabic words, is not strong.

A second point brought up in the discussion relating to secondary stress is the direction of lengthening and shortening. Least disagreement exists for trisyllabic loans, which everyone assumes to have been borrowed with short stressed vowels, although different scholars propose different reasons for this short vowel. However, for disyllabic words opinions differ greatly, as summarized in table 2. We will argue that all early loans were incorporated into English according to the native prosodic constraints, and any secondary stress that is observed is due to the prosodic structure

Table 2. *Overview of opinions regarding expected vowel length (VL) in disyllabic loans*

scholar	expected VL	Reason
Luick	• normally V̄ • alternatively V̆	• V̄: independent of secondary stress • (a) due to continental pronunciation (b) levelling on the basis of trisyllabic inflected forms
Eckhardt	• normally V̆ • alternatively V̄	• V̆: because of secondary stress • V̄: when secondary stress is lost
Bliss I	• V̄/V̆	• depending on Anglo-Norman VL
Bliss II	• V̄ • alternatively V̄	• V̄: because of OSL • V̆: if OSL is blocked due to segmental environments

of the language at that period. In the next section we propose that the intricate interaction of TSS and OSL accounts for the quantity in both native and borrowed words.

3 Interaction of TSS and OSL in Early Germanic

3.1 Effects of OSL in Germanic words

As discussed in the previous section, the length of vowels in disyllabic words in Middle English was not straightforward. Since a disyllabic base can become trisyllabic with the addition of suffixes, the interaction of TSS with any process affecting disyllabic words is vital. One such process is open syllable lengthening (OSL). Although the main focus of this paper is on TSS we need to briefly summarize the OSL facts in Germanic as discussed in detail in Lahiri & Dresher (in press), because TSS and OSL are so intimately connected.

OSL was added to the grammar of Middle English, lengthening stressed vowels in open syllables. Therefore, the initial stressed short syllables of disyllabic stems (native and borrowed) could potentially be lengthened both in the singular and in the plural with the addition of a suffix. 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 following surface alternations, which would obscure the original underlying differences between long and short vowels:

(7) Effects of OSL and TSS[11]

	Sing.	Plur.	Sing.	Plur.
OE	hæ̆ring	hæ̆ringas	æ̆cer	æ̆ceras
OSL	–	–	ǣcer	ǣceras
TSS	–	hæ̆ringas	–	æ̆ceras
Expected	hǣring	hæ̆ringas	ǣcer	æ̆ceras
NE	herring	herrings	acre	acres

If this pattern had been retained, we should find alternations in all disyllabic 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. The only alternations that exist in Modern English are in Romance loans which are derivationally related, as in *sincēre–sincĕrity*. Lahiri & Dresher (in press) argue that if language learners faced with such alternations as in (7) prefer to have one stem type in each paradigm, one would expect that both original long vowels as well as those lengthened by OSL would be equally affected

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[11] The ordering suggests that OSL applies first, and then TSS. It could also be the case that TSS blocked 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 related discussion.

by levelling. This is indeed the case. Original short open syllables in Old English are found as both long and short in Modern English, as shown in (8a). In (8b) we see the levelling of original Old English long vowels in Modern English. Romance loans which were borrowed in early Middle English occur with both short and long vowels in Modern English, as shown in (9).

(8)   Levelling in disyllabic words
    (a) Old English short open syllables in Modern English
       With long vowels: ăcer 'acre', bўdel 'beadle', bĕofor 'beaver', etc.
       With short vowels: bŏtm 'bottom', cămel 'camel', cănon 'canon', etc.
    (b) Old English long vowels in Modern English
       With long vowels: bēacen 'beacon', bītel, bīetel 'beetle', ǣfenn 'even(ing)' etc.
       With short vowels: hǣring 'herring', dēofol 'devil', bōsm 'bosom' etc.

(9)   Romance loans with open stressed syllables in Modern English
    With long vowels: fāvour, flāvour, rāzor, vāpour, etc.
    With short vowels: bărrel, chănnel, sŏcket, prŏfit, etc.

When we consider monosyllabic words, we find that the levelling could go either way: original long vowels could become short and vice versa. We discuss this in section 3.3.

3.2   Effects of OSL in loan words

As shown above, the levelling of vowel length in Middle English affected both Germanic and loan words. The data in table 3 show that, although the words all bore initial stress in early Middle English, the vowels varied in length. We claim that the stress of the loan words in early Middle English was normally nativized such that disyllabic words bore initial stress. Words which superficially looked as if they were prefixed could bear stress on the syllable following the prefix, just like the native vocabulary; cf. *profóund*. If we compare this with the corresponding loans in Dutch and German, which were mostly borrowed later at a stage where final stress was present in these languages, we observe a striking difference. The words in the list above were borrowed into English before the end of the fourteenth century. Words with final stress were borrowed into English much later, almost all after the sixteenth century, as shown in table 4.[12] The data in table 4 show that in the sixteenth century the prosodic system of English had changed. In this period, stress was assigned at the right edge rather than at the beginning of the word. Further, the foot type had also changed and stressed superheavy final syllables were permitted.[13]

3.3   Motivations for levelling

The presence of short vowels in open syllables in a large number of disyllabic words led several scholars to look for alternative explanations for OSL. For the Romance

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[12] Nowadays some of the words have variable stress. What is important, though, is that the final stressed forms all entered the languages in the Early Modern English period.

[13] These changes are beyond the scope of this paper; see Lahiri, Riad & Jacobs (1999) for details.

Table 3. *Disyllabic Romance loans in English, German, and Dutch*

English	First recorded in English	German	Dutch
(a) Short initial vowel in English			
baron	1200	Barón	barón
channel	1300	Kanál	kanáal
coral	1305	Korálle	koráal
jealous	1250		jalóers
Latin	1391	Latéin	Latíjn
metal	1340	Metáll	metáal
moral	1380	Morál	moráal
palace	1290	Palást	paléis
panel	1300	Panél	panéel
profit	1325	Profít	profíjt
satin	1366	Satín	satíjn
second	1391	Sekúnde	secónde
senate	1205	Senát	senáat
talent	893	Talént	talént
volume	1380	Volúmen	volúme
(b) Long initial vowel in English			
basin	1220	Basín	basín
closet	1370	Klosétt	closét
famous	1400	famós	faméus
moment	1240	Momént	momént
odour	1300	Odéur	
paper	1374	Papíer	papíer
patent	1387	Patént	patént
process	1330	Prozéß	procés
raisin	1382	Rosíne	rozíjn
vacant	1290	vakánt	vakánt

Table 4. *Disyllabic Romance loans with final stress*

Word	First recorded
bouquet	1716
bourgeois	1564
canal	1449
cement*	1300
champagne	1664
gazelle	1582/1700
gazette	1605
hotel	1644
moustache	1585
salon	1715
tableau	1699

*ME síment; first syllable is stressed till nineteenth century

borrowings, Wright & Wright (1928: §215) claim that the time of borrowing was relevant; words borrowed earlier underwent lengthening and others did not. Bliss argues that this claim does not hold. Words borrowed before the fourteenth century can have both long and short vowels, as we can see in table 3.

As mentioned in section 2, Luick (1907) proposed two alternative explanations. The first explanation is that the learned vocabulary contains disyllabic words with short initial vowels, whereas disyllabic words in the common language underwent OSL. As Bliss and others rightly point out, this explanation is invalid, as is clear from the examples in (8) and (9). The second explanation for the existence of disyllabic words with both long and short initial vowels is based on the analogy argument discussed above. Bliss (1952), however, does not look on the latter suggestion with favour either. Instead, he provides a list of factors that inhibit OSL based on surrounding segments, a medial liquid or a nasal being the most prominent causes for blocking OSL. However, there are many exceptions, as he himself states. What is clear is that there is considerable variation in the length of stressed vowels. If analogy is the source of this variation as Luick suggested then the only source of the analogy would have been the plural where TSS would have inhibited any vowel length.

In addition, there is further evidence that a certain amount of levelling took place. If we assume that length alternation in the singular and plural led to analogical levelling, then there was another class of nouns which should have shown this effect, namely the monosyllabic nouns with no affixation in the singular and a vowel-initial plural suffix, as in the original short-stem a̲-nouns: OE *god–godu* 'god', *dæg–dagas* 'day'. In Dutch, these nouns still have a vowel-length alternation in the singular and plural (*păd–pāden*). German has no long vowels in those forms which underwent processes like the High German Consonant shift which lengthened the consonants and blocked OSL, as in *Schiff–Schiffe*. In other cases, German chose to restructure the stem to a long vowel because of an independent process of vowel lengthening before voiced consonants (earlier *Pfăd > Pfād*). As expected, English has levelling in both directions, as seen in table 5.[14] If analogical levelling was not at play, and if OSL was not part of the grammar then it is hard to understand under what conditions some of these stems would become lengthened. For instance, starting from an original alternation *hwal–hwalas* 'whale', under our assumption, OSL would apply to the plural to create a length alternation *hwal–hwālas* (cf. Hogg, 1996). This asymmetric length in the initial vowel would be vulnerable to levelling, in one direction or the other. If there was no OSL, it is unclear why any of these nouns should end up with a long vowel. There was no other noun class in the language that had a pattern that could have induced this analogical change.

Because English did not retain length alternations in inflectional noun paradigms, when assessing the effects of TSS and OSL on English, it is essential to consider

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[14] A trace of such an alternation is *stăff–stāves*. Such alternations are of course found in words related by derivational morphology, such as *grăss–grāze, băth–bāthe*, etc.

Table 5. *Examples of original short-stem ạ-nouns in Dutch, English, and German*

Dutch				English				German			
păd	V̆	pāden	V̄	păth	V̆	păths	V̆	Pfād	V̄	Pfāde	V̄
gŏd	V̆	gōden	V̄	gŏd	V̆	gŏds	V̆	Gŏtt	V̆	Gŏtter	V̆
schĭp	V̆	schēpen	V̄	shĭp	V̆	shĭps	V̆	Schĭff	V̆	Schĭffe	V̆
dăl	V̆	dālen	V̄	dāle	V̄	dāles	V̄	Tāl	V̄	Tāler	V̄
grăf	V̆	grāven	V̄	grāve	V̄	grāves	V̄	Grāb	V̄	Grāber	V̄

Table 6. *Summary of nouns with and without lengthening*

OE		ME		NE	
(a) OSL in singular and plural: NE long vowels					
tălu	tăla	tālə	tālə > tāləs	tale	[eː]
năma	năman	nāmə	nāmən > nāməs	name	[eː]
(b) TSS in singular and plural: NE short vowels					
ǣrende	ǣrendu	ărendə	ărendə > ărendəs	errand	[ɛ]
wĭdewe	wĭdewan	wĭdewə	wĭdewən > wĭdewəs	widow	[ɪ]
(c) OSL in plural only: NE long and short vowels					
hwăl	hwălas	whăl	whăləs	whale	[eː]
gŏd	gŏdu	gŏd	gōdə > gōdəs	god	[ɒ]
(d) OSL in singular and TSS in plural: NE long and short vowels					
bĕofor	bĕoferas	bēver	bĕverəs	beaver	[iː]
wăter	wăteras	wāter	wăterəs	water	[ɒ]
(e) TSS in plural: NE long and short vowels					
bēacn	bēacn	bēcen	bēcen > bēcenəs	beacon	[iː]
dēofol	dēoflas	dēfel	dĕfeləs	devil	[ɛ]

vowel length in the paradigm as a whole. The crucial cases are summarized in table 6. If both the singular and the plural undergo OSL, as in table 6 (a), then the stem will be restructured at a later stage of the grammar with a long vowel. If, on the other hand, both the singular and plural undergo TSS, the stem should be restructured with a short vowel – cf. (b) in table 6.[15] However, if only one form – the plural or the singular – lengthens, or if they both lengthen but one form is shortened by TSS, then there is a possibility of the stem being 'analogically levelled' to having

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[15] Trisyllabic stems are rare in Germanic. Singular trisyllabic forms are either due to a suffix as in the *ụ*-nouns, or the stem-extension as in the *ja*-nouns: cf. *ǣrendu < ǣrend+j+u.*

either a short or a long vowel (cf. c, d, e). The claim here, then, is that OSL and TSS applied systematically everywhere. The reason why there are so many apparent random exceptions to the OSL rule is because of shortening rules like TSS present in the synchronic grammar of the language, which could lead to paradigmatic alternations of length in the singular and plural of nouns. Words like *water*, for instance, are claimed to have a long vowel in Chaucer according to Ellis' (1869–89) phonetic transcription of the Prologue (line 400). This vowel must have been later shortened, otherwise the Modern English counterpart would have been tense. Levelling assumes that OSL and TSS both apply; otherwise, it would be impossible to explain why some disyllabic stems, and monosyllabic stems with no ending in the singular, ever lengthened.

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. OSL affected verbs exactly in a parallel fashion in English, German and Dutch (cf. Lahiri & Dresher, in press for details). Our account of levelling implies that in late Middle English or early Modern English, the noun and verb stems were restructured to have either a short or a long vowel. Hence, no quantity alternations in inflectional paradigms are observable in this stage of the language.

Two further issues concerning analogical levelling need to be addressed. First, why did the levelling occur? Second, why was the levelling bi-directional?[16] We observe that in both English and German, the plurals (with overt endings) play at least as important a role as the singulars (with zero endings). We first turn to the reason for the levelling.

In a pair like ME *stōn–stōnes* 'stone', or *wĭdewe–wĭdewen* 'widow', both vowels have the same quantity and there is no question of levelling. However, in some words, there is lengthening in the plural, as in ME *hŏl–hōles* 'hole', while in other words the plural is shortened by TSS, as in ME *dēfel–dĕfeles* 'devil'. There are no prospects for salvaging a single phonological rule from this situation. Even a morphological rule appears to be unavailable: length cannot be associated with any particular morphological category, since vocalic length can be a property of the singular as well as the plural.

Thus, 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. In Lahiri & Dresher's 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 restructured, and since there is no particular bias for choosing a long or a short vowel, the underlying representation can be either.

Notice that the motivation for the levelling of vowel length in German paradigms is different from that of English. The paradigms did not become incoherent in German. Rather, the segregation of stems ending in voiced and voiceless consonants

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

set the stage for a reanalysis of OSL as lengthening before a voiced consonant.[17] In German there is no word-by-word selection of a long or short vowel. Rather, the restructuring proceeds by classes in a consistent direction. In Dutch, the vowel-length alternation remained transparent and therefore there was no need for levelling. Dutch still maintains the length alternations although synchronically these are now considered to be exceptional.

Minkova (1982), and subsequently Hayes (1989), have claimed that OSL was due to compensatory lengthening caused by the loss of a final schwa. According to them, the initial vowel was lengthened only in those words that lost their final vowel (as in *tale*).[18] Lahiri & Dresher (in press) provide strong comparative Germanic evidence against this position. For instance, both Dutch and German show effects of OSL without the loss of final schwa, as in MNL (Middle Dutch) *vĕdere > vēdere* 'feather'.

The compensatory lengthening analysis is taken over by Bermúdez-Otero (1998) who argues against the existence of TSS. To account for the lengthening in monosyllabic a-nouns, which is not predicted by the compensatory lengthening account, as in OE *hwal–hwalas* 'whale', he posits that the preference for mono-syllabic nouns with long vowels causes lengthening by a process of lexical diffusion. A third mechanism is proposed to account for the lengthening in words like *cradle* and *raven*. He suggests that the second syllable in such forms was variably pronounced with either a schwa or a syllabic sonorant. He argues that misperception of these variable pronunciations may lead to restructuring the input of words like *răven* as *rāven*. Jones (1989: 118), on the other hand, argues that when the coda of the second syllable is a sonorant, lengthening is blocked, and therefore predicts that the kind of restructuring proposed by Bermúdez-Otero is very unlikely. This point is also brought up by Bliss as we mentioned earlier.

To avoid any recourse to processes like TSS and OSL, Bermúdez-Otero's account thus involves at least three different mechanisms to account for the vowel-length properties of English: regular compensatory lengthening, occasional restructuring of originally short vowels in monosyllabic words (triggered by preferences), and sporadic restructuring of originally short vowels in disyllabic words with a sonorant in the second syllable (caused by misperception). Moreover, in spite of these three mechanisms, he is unable to account for the shortening of originally long vowels in disyllabic words.

Assuming the existence of both TSS and OSL, we claim that the interaction of these processes led to the subsequent levelling of vowel length, and therefore length alternations in inflectional paradigms no longer exist. The consequence of levelling was that certain stems changed their underlying quantity: OE *dēofol > dĕvil*, OE *bĕofor > bēaver*. After levelling and possible restructuring, TSS was no longer observable since by then the schwa in nominal paradigms (singular and plural) was

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[17] Theo Vennemann (p.c.) pointed out that in some Northern German dialects the vowel-length alternation still exists.

[18] In a later paper Minkova (1985) is not entirely satisfied with this analysis.

lost. However, TSS alternations are found in Modern English in derivational paradigms. We will discuss this in section 5 after we motivate the reasons for the presence of TSS and OSL in the medieval period.

4   Motivation for TSS and OSL

4.1   Prosodic background

In this section we provide the prosodic background against which OSL and TSS should be viewed. We will show that the prosodic structure at each stage of the language was responsible for quantity changes. We begin our account with the situation in Old English, and, more generally, in the common ancestor of the West Germanic languages. 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. Dresher & Lahiri (1991) argue that the metrical foot is a resolved and expanded moraic trochee ([μ μ(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 have 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 (10), and sample parsings are given in (11).

(10)   The Germanic Foot (Dresher & Lahiri, 1991)
       Foot type: Resolved expanded moraic trochee ([μ μ(μ)] μ)
       Direction of parsing: Left to right
       Main stress: Left

(11)   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 with a sequence of a light monomoraic syllable followed by any syllable (LX=H) plays a role throughout the Germanic languages. Dresher & Lahiri (1991) provide several types of evidence supporting the Germanic foot, including main and secondary stress, High Vowel Deletion in Old English, and Sievers' Law in Gothic. A heavy final syllable could in principle serve as the head of a foot, which would lead us to expect it to have secondary stress. Nevertheless, in Old English no final syllable, whether heavy or light, bears secondary stress (Campbell, 1959: §§87–92). When a heavy syllable becomes nonfinal due to the addition of suffixes, it does bear secondary stress in an appropriate metrical position. Thus, we find alternations such as ṓðer 'other nom. sing.' – ṓðèrne 'acc. sing.' and ǽðeling 'prince nom. sing.' – ǽðelìnges 'gen. sing.'. Their metrical structures are shown in (12), where an underlined H indicates a foot that lacks secondary stress:

(12) 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	<u>H</u>		H	H L		L L	<u>H</u>		L L	H	<u>H</u>
ō	ðer		ō	ðer ne		æ ðe ling			æ ðe	lin	ges

Dresher & Lahiri (1991: 260) account for the lack of stress by a rule of Final Destressing (FD), which defoots a final nonbranching foot. 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. 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 which are closed by a consonant. Now Final Destressing is open to reinterpretation by the language learner: rather than defooting a nonbranching foot, the same effect can be achieved by making a final consonant extrametrical.

Final consonant extrametricality[19] 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. The advantage of final consonant extrametricality over final defooting is that all final unstressed syllables can now be treated as metrically equivalent. We assume that, in the absence of contrary evidence, a uniform analysis of similar facts is preferred.

4.2   TSS and extrametricality

The reanalysis of Final Destressing as Consonant Extrametricality has no immediate effects on the placement of stress in words, but does affect the prosodic structure of many types of words. Some typical patterns are given in (13) (from Lahiri & Dresher, in press), where a defooted foot is indicated as (<u>H</u>) and final unfooted (stray) light syllables as L.

(13) Effects of reanalysis of Final Destressing (FD) as Consonant Extrametricality (CEM)

	FD	CEM	Example	
(a)	([LL])	([LL])	scipe	'ship'
(b)	([LH])	([LL])	water	'water'
(c)	([H]L)	([H]L)	stāna	'stone'
(d)	([H]) (<u>H</u>])	([H]L)	stānas	'stone-PL'
(e)	([LL] L)	([LL] L)	werude	'troop'
(f)	([LL]) (<u>H</u>])	([LL] L)	werudes	'troop-GEN'

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[19] This is true not only for single consonants but also for certain homorganic consonant clusters. This is a simplified statement; for details see Lahiri (1998). For our purposes, what is important is that consonant extrametricality would have made the entire sequence invisible for weight purposes.

(g)	([LH] L)	([LH] L)	cyninga	'king'
(h)	([LH]) ([H̲])	([LH] L)	cyningas	'king-PL'
(i)	([H]) ([H]L)	([H]) ([H]L)	*hēringe	'herring'
(j)	([H]) ([H]) ([H̲])	([H]) ([H]L)	*hēringes	'herring-GEN'
(k)	([H]L) L	([H]L) L	*clāvere	'clover'
(l)	([H]L) ([H̲])	([H]L) L	*clāveres	'clover-GEN'

Under a Consonant Extrametricality analysis, since a light syllable can be the weak member of a foot where a heavy syllable cannot, many previously defooted final syllables can be included into a foot (13d, f, h, j). On the other hand, these changes also have some less desirable consequences. First, Consonant Extrametricality leads to an increase in words where the second foot is branching while the main stressed foot is not (13i, j). Assuming that the main stressed foot is preferably as complex as, or more complex than, its dependent, this is not an optimal configuration (Dresher & van der Hulst, 1993, 1995). Second, Consonant Extrametricality leads to more final stranded syllables (13l). 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.

TSS results in improvements of these metrical patterns. The relevant cases are shown in (14), adapted from Lahiri et al. (1999).

(14) Metrical structures and TSS

	Old English	ME 1: CEM	ME 2: TSS	Examples
(a)	(H) (H) (H)	(H) (HL)	([LH]L)	*hēringes> heringes 'herring'
(b)	(H) (HL)	–	([LH]L)	*lāverke>laverke 'lark'
(c)	(HL) (H)	(HL) L	([LL]L)	*cīcenes> cicenes 'chicken'
(d)	(HL) L	–	([LL]L)	*clāvere>clavere 'clover'

Extrametricality allows the last two syllables to form a branching foot in (14a), in contrast to the main stressed foot which remains nonbranching, as was the case originally in (14b). In (14c), a light syllable is stranded as a result of extrametricality, as was already the case in (14d). We suggest that it was the strong 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 TSS. 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 necessity for vowel shortening.

4.3   OSL and TSS

Let us now turn to OSL. If TSS is ignored, one could suppose that OSL 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 (15).

(15) Middle English metrical patterns, assuming TSS

	Without OSL	After OSL	Example	
(a)	([LL])	([H]L)	tāle	'tale'
(b)	([H]L)	no change	stāne	'stone'
(c)	([LL] L)	no change (TSS)	clavere	'clover'
(d)	([LH] L)	no change (TSS)	laverke	'lark'

As (15) shows, the only actual effect of OSL in Middle English is to lengthen the initial syllable of words of type (15a), 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 main stressed foot. In these cases, however, TSS takes priority, keeping the initial syllable short.

   To recapitulate, the interaction of TSS and OSL led to vowel length alternations in inflectional paradigms which in turn led to analogical levelling towards one preferred form. The levelling was in both directions; original long vowels could become short and vice versa. In the next sections we discuss quantity alternations in the later history of English.

5   TSS in later English with borrowed suffixes

5.1   Lack of derivational relationship in Middle English

Since TSS and OSL led to analogical levelling of the quantity of the stressed vowel, the question remains how and when quantity alternations arose in Modern English. After the levelling, there were no quantity alternations in inflectional paradigms of both native and loan words. How do we then account for alternations like *sincēre–sincĕrity*? All recent analyses claim that TSS is triggered by a set of derivational suffixes, which in terms of Lexical Phonology are generally Level I suffixes (cf. Kiparsky, 1982b). All such suffixes are Romance suffixes, the native suffixes being stress neutral. Therefore, the issue that comes to mind immediately is the time of borrowing. We will show that the same prosodic constraints governing TSS and OSL in the native vocabulary were active for words borrowed before the sixteenth century.

   For illustration we will draw on one of the most discussed suffixes, *-ity*. This

disyllabic suffix is particularly interesting for our purposes since a monosyllabic base with a long vowel would become trisyllabic and undergo TSS as in *vain–vanity*. With disyllabic bases several possibilities arise. If the base was stressed on the second syllable as in *serene*, the suffixed form would also undergo TSS, as in *serenity*. Disyllabic words with initial stress, on the other hand, would preferably have an HL foot and hence an initial long vowel, as in *chaste*, which was disyllabic in early Middle English. Disyllabic bases like *humid*, which become quadrisyllabic when suffixed, should also retain the initial long vowel which is stressed. Stress would shift to the antepenultimate syllable only at a later stage. As late as in Levins (1570), there are quite a number of quadrisyllabic words with initial stress: *húmidity, bárbarity, prósperity.*

The suffix *-ity* is generally added to adjectives to form nouns. Up until now we have been discussing nouns, where we claim that disyllabic nouns are subject to TSS in the plural and are vulnerable to levelling as in *hǽring–hǽringas*. Since we will be looking at adjectival bases to which *-ity* is added, we are also interested in whether we find the same alternations for disyllabic adjectives. Vowel-initial inflectional endings for adjectives were rare in Middle English, therefore there would be little chance of paradigmatic alternation and, hence, no levelling in this period. Therefore, we expect most disyllabic adjectives with initial stress to have a long vowel (as in ME *vītal*), and trisyllabic adjectives with initial stress a short one (as in ME *mŏrale* 'moral', ME *păssyfe* 'passive'). Words that appear to be counter to our claims, like *rapid* (1634) and *obesity* (1611), were borrowed later.[20]

From the CELEX data base (1995) as well as retrograde dictionaries, we have compiled a list of *-ity* words existing in Modern English. A list of pairs with vowel length alternation is given in table 7. Prefixed forms like *inhumanity* or double suffixed words where the vowel alternation was triggered by the first suffix, like *originality,* were left out. Although there is a vast number of words with the *-ity* suffix, the actual number of words with TSS alternations with this suffix is rather small. The dates and the meanings refer to the first occurrence of the words in English obtained from the OED. From this list, we can make the following observations. First, the derived and underived words did not necessarily come in at the same period. In some instances the derived word was borrowed much later, as in *brief–brevity* or *fatal–fatality*. However, the opposite was also true: *sanity* was apparently borrowed two centuries before *sane*, *extremity* came in almost a hundred years before *extreme*, and so on. Second, the meanings of the words were not necessarily related. Compare, for example, the pair *sane–sanity*. The central meaning of the suffixed word in the fifteenth century was 'bodily health' which later became obsolete. The meaning 'mentally sound' emerged only in the seventeenth century when the word *sane* also appeared. We can conclude that the suffixed words were

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[20] As we mentioned earlier, disyllabic borrowed adjectives often have final stress, particularly when they appear to be prefixed as in *extreme*. This is particularly so if an adjective also had a corresponding verb like *divine*, which was used by Wyclif as a noun, verb, and adjective. Words like *humane* were stressed on the initial syllable as late as in Levins.

Table 7. *Loans ending in* -ity *with vowel-length alternation in the derivational paradigm: date of borrowing and meaning*

divine	pertaining to God	1374	1305	divinity	the science of divine things
extreme	existing in the utmost possible degree	1460	1375	extremity	the extremes as opposed to the mean
grave	weighty, important	1541	1519	gravity	seriousness, dignity
hostile	pertaining to the enemy	1594	1531	hostility	the state or fact of being hostile
humane	characterized by such a behaviour towards others that befits a man	1500	1382	humanity	the character of being humane
sane	of sane memory	1628	1432	sanity	bodily health
serene	honorific	1503	1450	serenity	title of honour
severe	rigorous condemnation or punishment	1548	1481	severity	strictness of life
sublime	expressing lofty ideas in a grand and elevated manner	1586	1526	sublimity	loftiness of nature
vain	worthless; useless	1300	1230	vanity	that which is worthless
verbose	wordy	1672	1542	verbosity	wordiness
cave	hollow, concave	1540	1541	cavity	hollow place
chaste	sexually pure	1225	1225	chastity	purity from unlawful sexual intercourse, ME chastete
able	having sufficient power	1325	1380	ability	sufficient power; ME ablete, abilite
austere	harsh to the feelings	1330	1340	austerity	harshness to the feelings
brief	of short duration; late ME bref	1325	1509	brevity	being short in speech or writing
clear	free from obscurity	1297	1340	clarity	glory, divine lustre
fatal	fateful; disastrous	1374	1490	fatality	the quality of causing death or disaster
inane	†in one and the same state	1320	1603	inanity	emptiness
obscene	offensive to the senses or to taste or refinement	1593	1608	obscenity	impurity, indecency, lewdness
opaque	lying in shadow, not illuminated	1420	1560	opacity	mental or intellectual dullness
profane	not pertaining or devoted to what is sacred	1483	1607	profanity	the quality of being profane
profound	characterized by intellectual depth	1305	1432	profundity	depth in a physical sense
senile	peculiar to the aged	1661	1791	senility	the condition of being senile
sincere	genuine; pure; honest	1533	1546	sincerity	purity

not initially perceived as being derived from the base; i.e. the suffix was not a productive suffix till much later. These pairs achieved a derivational relationship only afterwards (Marchand, 1969). Indeed, unlike *-ity* some of the non-native suffixes never became productive enough to be attached to native words.

What the evidence therefore points to is that the suffixed words were borrowed as independent words and not as derivationally related to the base. Thus, since most of the suffixed words were borrowed before the end of the sixteenth century, they would have conformed to the prosodic pattern of that period, namely the resolved moraic trochee. The interaction of OSL and TSS, which aimed towards a preferred structure of the resolved trochee, would not have given rise to a long vowel in words like *cavity*. Thus, the trisyllabic words were borrowed independently with a short vowel following the constraint of maximizing the foot.[21] Hence, a striking exception such as *obesity*, which came into the language in 1611 (*obese* was borrowed in 1651), indicates that the prosodic structure no longer forced a short vowel.

In Middle English, therefore, the loans would have been borrowed with the following structures:

(16) Assumed early Middle English foot formation

chā.ste	HL	(1225)	'chaste'
chǎ.ste.te	LLL	(1305)	'chastity'
vāin	H	(1300)	'worthless'
vǎ.ni.ty	LLL	(1230)	'worthless thing'
sāne	H	(1628)	'of sane memory'
sǎ.ni.ty	LLL	(1432)	'bodily health'
mǒ.ra.le	LLL	(1340)	'ethical'[22]
mǒ.ra.li.ty	LLLL	(1386)	'ethical wisdom'

To reiterate, we claim that many of the pairs like *clear–clarity, cave–cavity, serene–serenity* were not compositional. The suffixed word was not necessarily derived from a nonsuffixed base. Thus, in early Middle English there is no reason why the derived words should have undergone TSS at all. They were borrowed with short vowels constrained by the prosodic structure and remained as such. At a later period, perhaps in the seventeenth century, when the suffixes became part of the English grammar and a derivational relationship was established, the need for deriving one word from the other arose. How this could be done depended on the prosodic structure of the language of that later period. Once stress shifted from the left to the right edge (cf. Halle & Keyser, 1971; Lahiri et al., 1999), syllable extrametricality for nouns had been introduced, and the foot changed to an uneven trochee (cf. Kager, 1989; Burzio, 1994; among others) or a moraic trochee (cf. Prince, 1990; Hayes,

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[21] Minkova & Stockwell (1996) also conclude that pairs like *sane–sanity* were borrowed into English separately, with respectively long and short vowels. Since the form *sanity* always had a short vowel, they argue that there never was a process of TSS. We argue that words like *sanity* came in with a short vowel because TSS acted as an important constraint in the language. Otherwise, there is no reason why such vowels should always have been short.

[22] *Morále* 'moral principles' with final stress was borrowed in 1752.

1995; among others), a new form of TSS obtained the preferred structure. Hence, in trisyllabic words TSS acted as a constraint to ensure that the stressed vowel was not long, rather than as a shortening rule operating on a base with a long vowel.

A point to clarify is whether alternations due to TSS are observable in derivationally related native words. Neither traditional grammars nor the literature on TSS has explicitly addressed this question. Although borrowed suffixed words were not transparently derived, words with native suffixes bore a derivational relationship. Since both inflected words and loans were subject to TSS, this constraint obviously operated on prosodic words. Theoretically it would also affect derived words if they could be construed as a single prosodic word. However, most derivational suffixes were originally independent words and bore stress. Thus, they behaved as compounds and hence they would not be affected by TSS; cf. *idleness* and *wearifull.* If such compounds were reinterpreted as single prosodic words, they would be subject to TSS. The most frequently quoted words which did undergo TSS are *holiday, silliness, cleanliness*, and *readily,* deriving from *hāliȝ, gesǣlig-, clǣne-,* and *(ge)rǣde-.* Of course, the quantity of the adjectival and nominal bases could have changed due to paradigm levelling as a result of the interaction of OSL and TSS. However, words like *holiday* and *cleanliness* are difficult to explain without assuming that TSS operated on the derived words, since the adjectival base has retained its length.

Thus, TSS in the earlier times was a constraint on prosodic words, whereas TSS in the later period accounted only for alternations in the non-native derivational morphology. Crucially, TSS in Modern English does not operate on words with productive native derivational suffixes. Our claim is that once a derivational relationship was established with the non-native suffixes, TSS was interpreted as a constraint on derived words. Since it had not affected words with native derivational suffixes, unless they were interpreted as one prosodic word, this interpretation of TSS led to a split in the treatment of native vs. non-native suffixes. Even when native derivational suffixes were no longer separate prosodic words, the split was retained, and TSS continued to operate only on non-native derived words. Modern English analyses of the phonology–morphology interaction reflect this difference, either in level ordering or by marking the suffixes with different boundaries.

We now turn to analyses of TSS in Modern English where a derivational relationship exists and the base has a long vowel. Contrary to many previous analyses we conclude that TSS is still a foot-based constraint although the foot type has changed.

5.2   *Previous analyses of TSS in Modern English*

On our analysis TSS in the older stages occurred to maintain or achieve the preferred foot structure. Shortening processes usually have an effect on the prosodic structure of words; i.e. they lead to a more preferred syllable or foot structure. Although most analyses of TSS in Modern English relate shortening processes to changes in syllable structure rather than foot structure, they are not couched explicitly in terms of

improving prosodic structure. In this section we discuss various accounts of TSS in Modern English proposed in traditional and recent literature.

5.2.1   TSS as closed syllable shortening

There is a long tradition in attempting to reduce TSS to CSS in Modern English. Kiparsky (1968 [1982a: 21–2]) is one of the first to draw attention to the fact that these processes are closely related since part of the context in which they applied is identical. Vowels before two or more consonants, or in the third syllable from the end of a word, are shortened. He therefore maintains that the two rules are not distinct. The rule given in (17), repeated from (3), accounts for alternations like *sincere–sincerity* and *keep–kept* in Modern English.

(17) TSS and CSS (Kiparsky, 1968)

$$V \rightarrow [\text{-long}] / \text{—C} \begin{cases} C \\ \ldots V \ldots V \end{cases}$$

To take care of the discrepancy between derived and underived words in Modern English, Kiparsky (1982b, 1985) argues that TSS is a Level I lexical rule that only applies to certain suffixed forms like *sincerity* and fails to apply to nonderived words like *nightingale*.

Concurring with Kiparsky's approach to collapse TSS and CSS, Stampe (1979: 48–9) proposes an explanation for TSS based on stress induced resyllabification.[23] He argues that a stressed antepenultimate syllable attracts a consonant from a following unstressed syllable, which leads to resyllabification. The resyllabification creates a closed syllable with a long vowel, which undergoes vowel shortening. Thus, TSS could be viewed as an instance of CSS.

Myers (1987) accepts and elaborates on Stampe's proposal, arguing that extrametricality combined with resyllabification successfully accounts for Modern English alternations like those mentioned above, as well as for pairs like *tone–tonic*, where syllable extrametricality is revoked on independent grounds. Resyllabification leads to a sequence V́.CV̌ being syllabified as V́C.V̌, and if the stressed vowel is long, it would shorten in a closed syllable. Syllable extrametricality blocks resyllabification in words like *nature* which are syllabified as nĀ.<ture>. The initial vowel retains its length. In contrast, the suffixed word *natural* (nĀ.tu.<ral>) is resyllabified as nĀt.u.<ral> and the initial vowel is shortened since it is now in a closed syllable.

There are two significant consequences of Myers' analysis. First, suffixes like *-ic*, which are independently claimed not to undergo syllable extrametricality, cause vowel shortening. A word like *tonic* (tŌ.nic) is resyllabified to tŌn.ic and the vowel shortens. Verbs which undergo consonant extrametricality work in the same way. The verb *keep* (kee<p>) retains the long vowel since the consonant is extrametrical and does not close the syllable. Once the past-tense ending *-t* is added, the

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[23] (Re)syllabification was also suggested in many old grammars and dictionaries (cf. Walker 1791: 69), although not specifically linked to TSS.

syllabification is *keep<t>* and, since the vowel is in a closed syllable, it shortens, which is also reflected in the spelling of *kept*. Second, stressed vowels followed by an onsetless syllable or syllables with /h/ or /j/ as onsets do not undergo shortening, e.g. *cruel–cruelty*, *rely–reliable*, *agree–agreeable*. The lack of a consonantal onset prevents resyllabification and consequently CSS does not apply because its structural description is not met.

According to Myers, CSS is not a language-specific rule; rather, each language has to define its syllable template, which constrains the possible syllable outputs. The relevant template for English roots is as follows (Myers, 1987: 511; following Borowsky, 1986):

(18) Syllable template for English roots
      σ → C* V (X) (where X is C or V)

This template ensures that a root would maximally contain two segments in the rhyme. If stress-induced resyllabification, which Myers claims to be a fairly frequent phenomenon, would produce a heavier syllable than the template allows, CSS repairs the root syllable such that it conforms to the template.

An implication of Myers' analysis is that resyllabification does not always lead to CSS, since the syllable template is restricted to roots. Resyllabification leading to ambisyllabicity does occur in the postlexical phonology of English leading to many segmental changes (cf. Kahn, 1976; Gussenhoven, 1986; McCarthy & Prince, 1990; among others), without triggering CSS. The syllable template is only enforced at the root level where those suffixes are available that correspond to Level I in the model of Lexical Phonology. Presumably underived words such as *Gabriel*, *nightingale*, *Moulinex*, *Abraham*, *hooligan*, etc. (cf. Kiparsky, 1982b: 147–59; Myers, 1987: appendix) either are not subject to the root-level syllable template constraint or they do not undergo resyllabification. Level II suffixes do not lead to CSS either, as in *meanness*, *loneliness*, *openly*.

Although stress-induced resyllabification is well motivated in the postlexical phonology of English, it is unclear why this process applies at the lexical level to cause shortening in the derived closed syllable, since it does not improve the weight of the stressed syllable. The initial stressed syllable in [nĀ.tu.<ral>] is heavy to begin with and conforms to the preferred template. Resyllabification leads to an unacceptable syllable which is then shortened, as in [nĂt.u.<ral>]. The weight of the syllable, however, has not changed.

At first glance, the strongest argument in favour of Myers' analysis are instances with vowel hiatus like *agreeable.* Here the long vowels do not shorten because stress-induced resyllabification cannot give rise to a closed syllable. However, the first vowel in hiatus is never short in Germanic, independent of prosodic and morphological structure; cf. *real, reality, biennial, sobriety* etc. This is also noted by Eckhardt (1936; see §2.3). Thus, this constraint is more general and is unrelated to CSS or TSS.

Yip (1987) also views TSS as CSS, although her analysis does not involve stress-

induced resyllabification. Yip argues that the vowel-initial suffixes that trigger TSS are underlyingly consonant-initial, creating the right environment for precluster shortening or CSS. The vowel (usually /i/) is epenthesized after shortening has taken place. The suffixes *-ic*, *-id*, and *-ish* consist underlyingly of a single consonant and therefore the vowel shortening in the second member of pairs like *Spain–Span[i]sh*, *cone–con[i]c* is similar to the shortening in the second member of pairs like *wide–width*, *heal–health*. The same rationale lies behind the long–short distinction in pairs like *wise–wisdom* and *sane–san[i]ty*, which can now all be described by a CSS rule. In order to account for the fact that vowel epenthesis does occur in some CVCC structures (*cone–conic*), but not in others (*keep–kept*), Yip assumes that the suffixes *-th* and *-t* trigger regressive spreading of [-voice] from the suffix to the base, which, in turn, prevents epenthesis, because of the geminate integrity effect.[24]

Yip does not address the question of what triggers epenthesis. In cases like *cone–con[i]c* the nonepenthesized form is phonotactically an acceptable English word, and yet it does undergo epenthesis. Furthermore, Yip has to assume that epenthesis takes place after any root (not affected by regressive voice assimilation), including vowel-final ones, to account for pairs like *algebra–algebraic*. As in Myers' re-syllabification analysis, epenthesis surely improves neither syllable structure nor foot structure.

In a recent paper Rubach (1996) gives an analysis of TSS that is fairly similar to Yip's – TSS is in fact CSS – except that the vowel is underlyingly present as a floating segment, which is not syllabified at the time that CSS applies. By using floating vowels he avoids the problem of epenthesis. However, he still has to explain when these floating vowels do and do not play a role. Again, improving prosodic structure is not a consideration.

In sum, although Myers, Yip, and Rubach implicitly assume that shortening leads to preferred syllable structure, the devices employed to first obtain a nonpreferred syllable – ambisyllabicity, resyllabification, epenthesis, floating segments – are not well motivated. We now turn to arguments defending TSS as a constraint inducing preferred foot structure.

5.2.2 TSS as trochaic shortening

In an analysis of rhythmic harmony of prosodic systems, Prince (1990) briefly discusses TSS, which he claims to be trochaic shortening, resulting in a moraic trochee under syllable extrametricality. Explicitly denying a resyllabification approach, he claims that a sequence of [HL]<σ>, as in (sā)ni<ty>, undergoes trochaic shortening, resulting in a bimoraic [LL]<σ> foot, as in (săni)<ty>. He also regards CSS as trochaic shortening. In addition, he predicts that languages that have TSS also have penultimate lengthening in disyllabic words, assuming syllable extrametricality.

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[24] To account for the lack of epenthesis when the base ends in a sonorant, Yip assumes that regressive assimilation takes place, but its effects are undone when at a later stage in the derivation all sonorants become automatically voiced, even if they have been previously specified [-voice].

We agree with Prince's general idea that quantity adjustment is due to foot optimization and this analysis is to be preferred over CSS accounts. When stress shifted to the right edge and the foot became a regular moraic trochee, TSS can be viewed as maximizing the foot: (sā).ni.<ty > becomes (să .ni) <ty >.

However, the situations in which TSS has occurred throughout the history of English are far more complex than understood so far. Trochaic shortening as formulated by Prince cannot be a satisfactory analysis for earlier TSS. First, it could not have explained the vowel shortening from early OE *lǣwerke* to *lǎwerke,* or *hǣringas* to *hǎringas*, since even if final syllables are assumed to be extrametrical (we have argued in section 4 that English had consonant extrametricality at the time of the early TSS) the resulting foot is not a moraic trochee, but an uneven trochee [LH]. Second, syllable extrametricality does not necessarily trigger TSS, as can be seen in Middle Dutch (MNL) and Middle High German (MHG). These languages had syllable extrametricality and OSL – which is a more general extension of penultimate lengthening – regardless of the number of syllables in a word, as in MNL *vĕdere* > *vēdere* 'feather'. We argue that the foot was optimized in all the Germanic languages, but it was not always the moraic trochee.

In sum, it is widely held that in Modern English (a) TSS is triggered by (certain) suffixes and (b) it is a version of CSS. The first claim is not controversial. The second claim either needs to assume stress-based resyllabification along with syllable extrametricality for the relevant suffixes (Kiparsky, 1968, 1982a, b, 1985; Stampe, 1979; Myers, 1987), or to treat all relevant suffixes as consonant-initial, thereby introducing intervocalic consonant clusters (Yip, 1987; Rubach, 1996). Although these approaches differ in crucial ways, they all lead to the same general conclusion that the target syllable is or becomes closed and the vowel shortened.

Contrary to these claims, we believe that TSS, both in early English and now, is triggered by preferred foot structure. In early English, consonant extrametricality led to shortening in order to maximize the resolved trochee. Middle English loans also followed this preference. Later, in Modern English, TSS also seems to be foot based, but now the foot is a moraic trochee (as in Prince, 1990).

6   Laxing or tensing?

6.1   *Medial laxing*

We have claimed that many of the suffixed words of Romance origin that came into early Middle English were borrowed independently of the underived counterparts, and that the vowel length was constrained by TSS. However, what still remains unexplained in Modern English is a possible relationship between TSS and the pairs with 'lexically conditioned' shortening (cf. Kiparsky, 1979: 431) or medial laxing like *presīde–presĭdent, admīre–admĭrable, maintāin–maintĕnance,* etc. These words differ from pairs like *explain–explanation,* where the destressing of the antepenultimate vowel is due to normal stress clash. The same holds for *ability.* When main stress is

assigned to the antepenult, the first syllable is destressed and shortened due to stress clash: (ǽ) (bí. li.) <ty> → ɑ (bí. li.) <ty>.

The pairs like *preside–president* are special because not only is a stressed long vowel destressed and shortened, but also the main stress is shifted to the preceding syllable. If one assumes the second vowel to be underlyingly long, as is generally done in the literature, then it is difficult to explain the following derivation without recourse to special means:

(19) Medial laxing
    (a) expected pattern with regular (de)stressing rules of Modern English

$$\begin{array}{ccccc} & \text{X} & & & \text{X} \\ & (\text{x}) \, (\text{x}) & & & (\text{x}) \\ \text{prē.sī. <dent>} & \rightarrow & \text{prē.sī. <dent>} & \rightarrow & \text{*prē.sī. <dent>} \end{array}$$

    (b) the correct surface pattern

$$\begin{array}{c} \text{X} \\ (\text{x . }) \\ \text{prĕ.sĭ. <dent>} \end{array}$$

Kiparsky draws particular attention to these facts arguing that these words cannot be instances of any sort of stress retraction (as in *concentrate*), because the final syllable contains a lax vowel and does not bear stress. He suggests that the medial long vowel must first be shortened before stress assignment, and draws support from the fact that no closed penults are ever skipped in this fashion: prē.sī.<dent> → prē.si.<dent> → (prē).si.<dent>. Myers (1987), on the other hand, argues that these pairs are instances of sonorant destressing whereby the main stressed long vowel is destressed when preceded by another stressed foot. The vowel then undergoes shortening: prē.sī.<dent> → (prè)(sí)<dent> → (pré)si<dent>. We will discuss the different views on medial laxing in Modern English in section 6.4, but at present the focus of our interest is different from that of these researchers.

We are concerned not so much with the shortening of the vowel which bears main stress in the base (second vowel of *preside, revere*) and is then reduced in the derived word (the second vowel in *president, reverence*), but with the assumed shortening of the vowel which bears stress when suffixed (the initial vowel in *president, reverence*). It is generally assumed that the underlying initial syllable in the base words is heavy. The issue here is whether the shortening of the initial vowel in the derived words is related to TSS, and how these words were borrowed into the language. From a diachronic perspective, we would like to know how such a state of affairs came about.

To examine these alternations systematically we have to separate productive suffixes like *-able* from the nonproductive ones like *-ence* because they play different roles with respect to prosodic structure. Romance suffixes which became productive at an early period should behave like native suffixes (such as *-ness*), while suffixes like *-ence* should behave like words with *-ity* as discussed in section 5. We first discuss the unproductive suffixes in section 6.2 and then move on to the productive ones in section 6.3.

6.2   Unproductive suffixes

Words with -*ence, -ive* could be found in Chaucer's time, where stress was generally initial.[25] Even in Levins (1570), we find words like *pérspective* and *défective,* showing that as late as the sixteenth century stress could well fall on the first syllable. Assuming Ellis' (1869–89) transcription of Chaucer's pronunciation, the initial vowel in *reverence* was long and the word was quadrisyllabic. Ellis' phonetic transcription was [ree.veren.ce] (cf. p. 687), the dots denoting stress on the preceding syllable (Part III: 679), although main stress is not distinguished. Syllables without dots are unaccented. Assuming that the resolved trochee was still in force, the word would have had two feet, both maximal, assuming that the second syllable had a short vowel. TSS would not have applied to *rēverence*.

(20) Metrical structure of 'medial laxing' loans in early Middle English

```
      X
   (x  . ) (x   . )
    H L   H  L
    rē ve  ren ce
```

After the loss of final schwa (cf. Minkova, 1991), there was no change in main stress, but a change in the metrical structure could be expected. Recall that consonant extrametricality had been invoked, making the final syllable light (see section 4 and footnote 18). Because of the preference to maximize the foot, in our analysis of TSS the main stressed vowel is shortened. This is seen in (21) where the deleted vowel is underlined.

(21) TSS after final vowel deletion

```
      X
   ([x] . ) .                    ([x .]  .)
    H  L  L                       L L  L
    rē ve re <nc>e     →         rĕ ve re <nc>e
```

Why was the second vowel in *revĕrence* lax and unstressed in Chaucer as it is now if one assumes that these were long in the first place, based on words like *revēre*? Our account does not refer to any 'shortening' of the medial vowel in words like *revĕrence*. The diachronic answer is that in this set of words the base words were mostly borrowed *after* the suffixed words, as can be seen in table 8. When a word like *reverence* was borrowed into the language, it would have been initially stressed with the structure in (20). In no sense was the medial syllable '*ve*' of *reverence* long, since the corresponding verb *revere* had not been borrowed yet. Given the prosodic structure of the language at that time, these trisyllabic and quadrisyllabic words could never have had a medial long vowel. The underived verbs were borrowed into English separately.

Our conjecture is that when the relevant verbs were borrowed, the situation was as

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[25] Stress was nativized for all loans other than those that were clearly prefixed verbs. According to Halle & Keyser (1971), stress did not totally shift to the right till the 16th century.

Table 8. *Medial laxing alternations*

abstain	1380	to withhold oneself
	1534	to refrain from food
abstinence	1300	forbearance of any indulgence of appetite
confide	1455	to trust or have faith
confidence	1430	reliance, faith
relate	1490	† to be borne or thrust in between things
	1530	to narrate
relation	1390	the action of relating in words
relative (N)	1388	(gram) a relative word
	1426	person) standing in some relationship to another
relative (A)	1530	(gram) relating or referring to an antecedent term
	1594	related to
reside	1456	to live for the discharge of official duties
	1460	† to settle
	1586	† to subside
residence	1380	the fact of living at some place for discharge of special duties
	1386	to have one's dwelling place
	1541	deposit
resident (A)	1382	having an abode in a place
revere	1661	regard with respect
reverence	1290	deep respect
finite	1493	† fixed, determined
	1597	limited
infinite	1385	unlimited in number
potent	1500	powerful
impotent	1390	physically weak
preside	1611	to act as president
president	1375	the appointed governor of a province
precede	1375	† to go before or beyond in quality or degree
	1485	to go before in rank or importance
precedence	1484	preceding in time; the fact of preceding
precedent	1391	preceding in time
saliva	1676	spittle
salivate	1669	to produce an unusual secretion of saliva

follows. For prefixed verbs, stress fell on the root. The prefix generally bore secondary stress. If final schwas had disappeared from the language at the time of borrowing, under consonant extrametricality the root would be subminimal and the vowel would have been lengthened to fulfil the requirement for a foot, as shown in (22a). If the final schwa was present the stem underwent OSL to maximize the foot, as in (22b). In both cases OSL lengthened the vowel in the prefix as well.

(22) Prosodic structure of borrowed verbs

(a)   X
     (x) (x)
     rē vē\<r\>e̱   (1661)

(b)   X
     (x) (x   .)
     prē cē de   (1375)

Only when the pairs were viewed as related was a synchronic derivation established. Our claim is that the underlying vowel remained short and the length was derived in the verb. In present-day English as well, the alternation could be accounted for by tensing rather than laxing, as we discuss in section 6.4. In pairs like *confidence–confide* or *president–preside*, if the base vowel was short, assuming consonant extrametricality and stress in the verb on the base rather than initial (i.e. on the prefix), the form [kʌnfɪ\<d\>] would contain an unacceptable foot leading to the tensing of the final vowel [kʌnfaɪ\<d\>].

If this historical account holds, then other suffixes without an original final schwa like *-ent,* which had the same effect of medial laxing, should also behave in a similar fashion with regard to the initial stressed syllable. Although the suffixes *-ent* and *-ence* are historically related, the former suffix never occurred with a final vowel in Middle English: it has a sonorant plus obstruent cluster and all early words of CVCV(C) structure plus *-ent* were stressed initially. To our knowledge, the initial vowel in words like *resident* was never lengthened. If the final cluster did not add weight to the final syllable, the foot would have been maximal and there would have been no need for OSL to apply.

6.3   *Productive Romance suffixes*

The suffix *-able/-ible* is one of the few borrowed suffixes which became productive very early on (cf. Marchand, 1969). Here we are concerned with the lack of a long medial vowel in *ádmirable* (1596), *cómparable* (1413) and *révocable* (1471), if one assumes that the second vowel is related to the stressed (final) one in *admíre, compáre,* and *revóke.* Our story is that these words behave no differently from the others with medial laxing. That is, these particular words were also borrowed independently and not derived from the corresponding verbs. If this is indeed the case then these words follow the same medial laxing pattern, or rather lack of medial laxing, as mentioned in section 6.1 and section 6.2.

There is, however, a difference. As can be seen in table 9, the dates of borrowing of the base form were quite early, and in fact the *-able* words with medial laxing were borrowed much later. So in principle they could have been derived from the verbs but we claim that they are not. These suffixed words often have parallel forms where the stress falls on the same vowel as it is on the base which retains its length: *compárable, admírable, repáirable.* Marchand (1969: 230) mentions that the suffixed words which have different stress placement are not derived from the corresponding

Table 9. *The productive borrowed suffix* -able

repair	13..	to adorn, ornament
	1387	to restore in good condition
réparable	1570	capable of being repaired
repáirable	1489	capable of being repaired
reparation	1384;1389	† reconciliation; act of restoring
divide	1374	to separate into parts
division	1374	action of dividing
divisible	1552	capable of being divided
divídable	1587	capable of being divided
compare	1375	to speak of as similar; ME cómper
cómparable	1413	capable of comparison
admire	1590	to feel or express surprise or astonishment, to wonder at
ádmirable	1596	to be wondered at
admiration	1506	the action of wondering
revoke	1374	to bring back
revókable	1584	capable of being revoked
révocable	1472	capable of being revoked

verbs. He also states that the 'derivative equivalent' for the verb *revóke* is *revókable* (1584) and not *révocable* (1472).

The different stress pairs with -*able* are part of the reason for Aronoff's (1976) assumption that two different suffixes were involved. The productive suffix gave *repáirable* while the more restricted suffix led to a stress shift. Aronoff's account relates directly to the history of these suffixes. Note that sometimes the words with predictable stress were borrowed earlier (cf. *reparable* and *repairable*). Arguably, when *ádmirable, dívisible* or *réparable* came in, they were not derived from the verb, but were patterned according to other derived words of the set like *reparation,* which had at the time initial stress and a medial lax vowel. Similarly, *divisible* was more likely to have been related to *division* than to have derived directly from *divide.* Note that in Middle English, the verb *cómper* was stressed initially and then *cómparable* was the expected form in either analysis. Only later, presumably after the verb changed to *compáre*, was *compárable* derived.

Thus, this set of words is different from the set with unproductive suffixes. The suffix -*able* became productive very early, as is evident from the following words which have a native base: *eatable* (1483), *available* (1451), *believable* (1382), *favourable* (1340), etc. Here we claim that the suffix was disyllabic as Danielsson (1948) suggested. Therefore this suffix bore secondary stress (being associated with 'able') and hence these words were not vulnerable to TSS. The words which show apparent medial laxing came in as independent words and this is reflected in the differences in meaning even to this day, as Aronoff points out. This suggests that they were

certainly not productively derived from the base but were borrowed again in analogy to other forms.

6.4   Tensing of the base in Modern English

So far we have argued that there was no medial laxing when the derived words were borrowed into the language, since they were treated as independent words. At a certain point in the Middle English period the speakers established a derivational relationship. Therefore, the present-day alternation with medial laxing requires explanation. All along it has been assumed that synchronically the long vowels are basic and that the lax vowels in the suffixed words are derived (Kiparsky, 1979; Hammond, 1984; Kager, 1989; Burzio, 1994; among others). Modern English is rich in its vowel-length and stress-shifting alternations. Vowels bearing main stress are shortened in closed syllables, as we have seen earlier. Also, under cyclic stress assignment and stress clash, long vowels can be shortened and destressed, as in pairs like *explain–explanation*. However, only in pairs like *revere–reverence,* not only is a stressed long vowel destressed and shortened, but also the main stress is shifted to a preceding syllable, which otherwise never occurs.

Kiparsky (1979) argues that medial vowels are shortened, rather than undergoing stress retraction, for otherwise one would have expected words with a medial closed syllable to be skipped when followed by a stressless suffix. That is, one would expect words like *expéct–*éxpectate*, etc. It is not clear, however, why a suffix with a long vowel is easier to skip than a closed syllable. In contrast, Myers (1987: 505) and Kager (1989:165) equate pairs like *confide–confidence* with pairs like *perspire–perspiration* and *explain–explanation.* The details of their analyses, however, differ. According to Myers, the main stressed vowel is destressed when preceded by another stressed foot (sonorant destressing) which triggers vowel shortening. Kager (1989: 119–20, 165) is critical of Myers (1987) and proposes (following Hammond, 1984) a version of 'medial laxing' which laxes medial vowels in certain morphological contexts. Burzio (1994) differs somewhat from Kager. He begins by suggesting that tensing rather than laxing accounts for the alternations as in *confide–confidence* (chapter 3), but since he later wants to equate *divine–divinity* with *confide–confidence,* the tensing analysis is given up in favour of a laxing account. Gussenhoven (1994), however, explicitly makes use of Kiparsky's intuition that these pairs are lexical exceptions.

Our analysis is more in line with Gussenhoven (1994) and Kiparsky (1979) than with Kager (1989), Myers (1987), and Burzio (1994) in that we believe that pairs like *confide–confidence* and *preside–president* are different from *explain–explanation* and *divine–divinity*. Gussenhoven (1994: 88) clearly marks words like *confidence* as exceptional, while Kiparsky accounts for them with a lexically conditioned rule. The difference between our point of view and the others is that we account for these alternations by tensing rather than laxing, both diachronically and synchronically. We claim that what is involved here is a tensing of the 'base' word rather than a

laxing of the 'derived' word. Our account presupposes that once the derivational relationship was established, there could exist pairs where there is no vowel tensing since the underlying vowel in both words would be tense. This is indeed the case where historically the derived words were borrowed later, as in *condole* (1590) – *condolence* (1603). Analyses which have laxing rather than tensing would mark these as exceptional. We assume that the vowel here is underlyingly long and nothing further needs to be said.

7   Conclusions

The various quantity alternations that we have studied lead us to conclude that TSS operated as a prosodic constraint throughout the history of English. The introduction of TSS was linked to the lack of vowel-length contrast in final syllables, which in turn led to consonant extrametricality. Interacting with OSL, TSS optimized the prosodic structure in the medieval stages of English. This led to quantity alternations in inflectional paradigms and occasionally in derived words when they were seen as one prosodic word. In addition, since OSL and TSS were operative for the entire grammar, loans were adapted accordingly. There is no doubt that Romance loans in the Middle English period followed the Germanic stress pattern. The alternations in Romance loans which involve TSS, like *sincere–sincerity*, arose from words borrowed individually, sometimes unrelated in meaning, and often the suffixed words were borrowed earlier than the base words. Since initially these words were treated as derivationally unrelated, what is significant is that they entered the language with the preferred foot structure at the time of borrowing: the resolved moraic trochee. We have argued, furthermore, that TSS is independent of CSS, although both optimized prosodic structure. Contrary to TSS and OSL, which are foot based, CSS is syllable based.

To account for the levelling of length alternations in pairs like *hēring–hĕringas*, which did not occur in pairs like *vāin–vănity,* our claim is that general levelling and restructuring of stems is contingent on alternations in inflectional paradigms. To take it one step further, the nature of the data on which restructuring is based is vital. Any opacity or unclarity in the available data may lead to a change, but only certain types of alternations are relevant, including nominative forms for nouns, infinitive, second and third person singular for verbs (Lahiri, 1982; Lahiri & Dresher, 1983–84; Fikkert, 1994). The important point is that as long as the phonological relationship is transparent, alternations are retained, as in Dutch. Also, derivationally related words like *vain–vanity* could, in principle, be treated in the same way as inflectional paradigms. If such pairs are transparent in their morphological and semantic relationship, they could also form the basis for restructuring for the language learner if the phonological relationship is opaque. However, this has not been the case in English.

The difference in the effect of TSS between the native and non-native suffixed words in Modern English came about in several steps. We have claimed that only

those suffixed words which were single prosodic words were constrained by TSS. However, most native suffixes were independent words, as were certain Romance suffixes like -*able* that became productive very early. TSS also affected loans which were borrowed as single words. Only when a derivational relationship was established between pairs like *vain–vanity*, was TSS reinterpreted as affecting derived words. This led to a dichotomy between native and non-native suffixes. Even later when native suffixes were no longer seen as independent prosodic words, the split was retained.

We further claim that not all non-native suffixes behave alike. Pairs like *revere–reverence* differ from *vain–vanity*, although the former were also borrowed independently. Contrary to the general assumption, we believe that when the derivational relationship was established between *revere* and *reverence*, unlike *vain–vanity*, the short vowels were treated as basic, and the vowel in the verb was lengthened. The vowel quantity in the noun remained governed by TSS.

In sum, TSS was triggered by prosodic preferences throughout the history of English. It affected both native and early borrowings, and through interaction with OSL, TSS led to quantity alternations in inflectional paradigms which were later levelled out. Romance loans, both suffixed and non-suffixed forms, were borrowed in their entirety and adapted to the prosodic structure of the borrowing languages which included the constraint of TSS. Only later, when these words came to be derivationally related, were quantity alternations observable, again constrained by TSS following the prosodic system of that stage. Thus, at each stage, TSS served the same purpose of optimizing the prosodic structure.

We do not claim that synchronic analyses are guided by change, nor do we claim that diachronic facts must be reflected in synchronic accounts. But history often haunts synchronic alternations and 'exceptions' appear precisely where change interfered.

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