Homorganic Cluster Lengthening, Pre-Cluster Shortening and Preference-Based Change in Early English*

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This paper discusses the processes of Homorganic Cluster Lengthening (HCL) and Pre-Cluster Shortening (PCS) occurring in the late Old English and Early Middle English periods. These processes are responsible, respectively, for vowel-lengthening before voiced homorganic consonant clusters (OE *bindan, feld, hund* > lOE/EME *bīnd*, *fēld, hūnd*) and vowel shortening before other clusters (OE *cēpte, fīfta, brōhte* > ME *kepte, fifte, brohte*). This paper builds on reassessments of data by Minkova (2014) to contribute an account of HCL within the system of "preference laws" articulated by Vennemann (1988). This account attributes the motivation for HCL to preferences for syllable-internal transitions between nucleus and coda in order to explain the fine details of HCL; namely, the fact that HCL applies with higher frequency to high vowels followed nasals than to low/mid vowels and in a sporadic manner to front vowels followed by /l/ compared to back vowels. These differences are attributed to the application of the Coda and Nucleus Laws (Vennemann 1988: 25, 42), with additional proposals about the effect of velarization of /l/ in Old English, with comparison to PCS providing important context throughout.

Keywords: Old English, Middle English, homorganic cluster lengthening, pre-cluster shortening, preference laws, sound change

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1. Introduction

This paper discusses two phonological changes occurring in the Old English and Early Middle English periods: Homorganic Cluster Lengthening (HCL) and Pre-Cluster Shortening (PCS). These processes are responsible, respectively, for the lengthening of short vowels preceding voiced homorganic consonant clusters (OE *ċild* > ME *chīld*) and the shortening of long vowels before other cluster-types in OE (OE *cēpte* > ME *kepte*). These sound changes have figured in most accounts of the phonological diachrony of Early English, but the precise details of their application and extent have continued to stimulate debate. This paper reviews the relevant data and proposes an account of HCL, with comparison to PCS, based in the system of “preference laws” developed by Theo Vennemann (1988) and later work. The core proposals are such that the distribution of HCL can be attributed to preferences in syllable-internal transitions between segments in the nucleus and coda of words. In particular, the account presented here captures the fact that HCL applies with higher frequency to high vowels followed by nasals than to low/mid vowels, and in a sporadic manner to front vowels followed by /l/ compared to back vowels. These differences are attributed to the application of the Coda and Nucleus Laws (Vennemann 1988: 25, 42), along with proposals about the effect of velarization of /l/ in Old English, with comparison to PCS providing important context throughout.

The paper is organized as follows: Section 2 introduces the phenomena of HCL and PCS in detail, relying on data derived from surveys in Campbell (1959), Hogg (1992), Minkova & Stockwell (1992), Liberman (1992), Vennemann (2000), and Minkova (2014). Section 3 provides an overview of prior accounts of these phenomena, demonstrating how HCL is treated exceptionally in each, while PCS is not. Section 4 contains the central proposals of the paper. Section 5 summarizes the proposals in the context of other accounts and presents some conclusions.

2. Background

2.1 Homorganic Cluster Lengthening

Between the 7th and 9th centuries (see Liberman 1992), short vowels in Old English lengthened before a homorganic (i.e., sharing the same specification of place) sequence of sonorant (either a liquid or nasal segment) plus a voiced obstruent. The set of homorganic clusters that are typically cited as relevant for lengthening is as follows: /ld, nd, ng, mb, rd, rs, rð/. However, I will follow Minkova & Stockwell (1992: 197–

198) and Minkova (2014: 165) in setting aside all clusters except for /ld/ and /nd/ on the grounds that other clusters are subject to various interfering factors which exclude them from the definition of HCL.

In the case of /ng/ and /rC/, no lengthenings have actually survived to Present-Day English (PDE), and evidence of lengthening in ME is largely reconstructed and/or may be due to other factors beyond HCL (e.g., /r/-vocalization for /rC/; see Minkova 2014: 121–124). In the case of /mb/, the dataset is too small to make solid generalizations (only nine forms survive, four of which lengthen: PDE *climb, comb, coomb/combe, womb*) and inconsistency in the simplification of /mb/ to /m/ in late OE (cf. OE *dum(b)e* 'dumb', OE *þume* 'thumb') prevents us from classifying such lengthenings as strictly instances of HCL. In contrast, the clusters /ld/ and /nd/ show the most consistent lengthening effects which can be confidently tied to the homorganic nature of the cluster and the segmental makeup of the consonants and vowels involved.

Lengthening did not occur before geminate liquids or nasals, nor did it occur before non-homorganic clusters. In the former case, this is illustrated by OE *fyllan*, which becomes *fill* in PDE rather than *fyllan* > *fīll*. In the latter case, OE *wæps* shows PDE *wasp*, rather than *wǣsp/wēsp*. Together, these contexts show that the vocalic lengthening involved in HCL is strongly conditioned by (i) the homorganicity of the cluster and (ii) the differentiation between the first and second segment in the cluster (liquid/nasal followed by obstruent).

Vowel quality is also an important conditioning factor. Minkova & Stockwell (1992: 199) find that, before the cluster /ld/, the back vowels /a/ and /o/ lengthened categorically, as shown in Table 1. A single example of a high back vowel possibly lengthening is noted by Minkova (2014: 168): *shoulder* < OE *sculdor*. In contrast, the front vowels /i/ and /e/ lengthened more sporadically, with about 60% undergoing lengthening and the rest remaining short, as in Table 2.

Table 1. Lengthening of back vowels before /ld/.

	Old English	**Middle English**	**Present-Day English**
/ald, old/	**a**ld (Angl.)	**ā**ld, **ǭ**ld	"old" [oʊ]
	c**a**ld	c**ā**ld, c**ǭ**ld	"cold" [oʊ]
	h**a**ldan	h**ā**lden, h**ǭ**lden	"hold" [oʊ]
	g**o**ld	g**ǭ**ld, g**oo**ld	"gold" [oʊ]

(Also: b**o**ld, f**o**ld, h**o**ld, m**o**ld, s**o**ld, etc.)

Table 2. Sporadic lengthening of front vowels before /ld/.

	Old English	Middle English	Present-Day English
/ild, eld/	ċ**i**ld	ch**ī**ld	"child" [aɪ]
	m**i**lde	m**ī**lde	"mild" [aɪ]
	w**i**lde	w**ī**lde	"wild" [aɪ]
	f**e**ld	f**ẹ̄**ld, f**ee**ld	"field" [iː]
	sc**e**ld	sc**ẹ̄**ld, sh**ee**ld	"shield" [iː]
	g**y**ldan	g**i**lden	"gild" [ɪ]
	m**e**ldan	m**e**ld	"meld" [ɛ]
	s**e**ldan	s**e**ldom	"seldom" [ɛ]

(Also: b**ui**ld, g**ui**ld, **e**lder, etc.)

Before the cluster /nd/, vowel height is more important. High vowels /i/ and /u/ underwent categorical lengthening (as in Table 3), while mid/low vowels /a, o, e/ remained short in all cases, (as in Table 4) (Minkova & Stockwell 1992: 198).

Table 3. Lengthening of high vowels before /nd/

	Old English	Middle English	Present-Day English
/ind, und/	b**i**ndan	b**ī**nden	"bind" [aɪ]
	bl**i**nd	bl**ī**nd	"blind"[aɪ]
	f**i**ndan	f**ī**nden	"find"[aɪ]
	ġec**y**nde	k**ī**nde/k**ȳ**nde	"kind"[aɪ]
	(be)h**i**ndan	bih**ī**nde	"behind"[aɪ]
	w**i**ndan	w**ī**nden	"wind" (v.) [aɪ]
	gr**u**nd	gr**ū**nd, ground	"ground" [aʊ]
	h**u**nd	h**ū**nd, h**ou**nd	"hound" [aʊ]
	p**u**nd	p**ū**nd, p**ou**nd	"pound" [aʊ]

Table 4. Non-lengthening of mid/low vowels before /nd/.

	Old English	Middle English	Present-Day English
/and, ond, end/	b**a**nd	b**a**nd	“band” [æ]
	c**a**ndel	c**a**nd(e)le	“candle” [æ]
	h**a**nd, h**o**nd	h**a**nd	“hand” [æ]
	l**a**nd, l**o**nd	l**a**nd	“land” [æ]
	st**a**ndan	st**a**nden	“stand” [æ]
	w**e**ndan	w**e**nden	“wend (went)” [ɛ]
	s**e**ndan	s**e**nden	“send” [ɛ]

(Also: s**a**nd, b**e**nd, **e**nd, r**e**nd, sp**e**nd, etc.)

Finally, it is notable that HCL was blocked in contexts where a short vowel was followed by three consonants, even when the cluster formed by the first two consonants, along with vowel quality, would otherwise have conditioned lengthening.

Table 5. Blocking of HCL.

	Old English	Middle English	Present-Day English
/VCCC/	ċ**i**ldru	ch**i**ldren	“children” [ɪ]
	t**y**ndre	t**i**nder	“tinder” [ɪ]
	h**u**ndred	h**u**ndred	“hundred” [ʌ]
	s**u**ndrian	s**u**nder	“sunder” [ʌ]
	w**u**ndrian	w**o**nder	“wonder” [ʌ]

The upshot of these observations (emphasized by Minkova 2014) is that HCL is neither as homogenous nor as widespread as has been typically characterized in prior work. The process is at once more limited than is generally discussed, with exceptions being relatively easy to find, and more systematic than has been thus far appreciated. The cross-weaving interaction of segmental properties for both vowels and consonants and the narrow, highly-specified environment in which HCL occurs makes accounting for this sound change notoriously difficult, and it has accordingly provided fodder for much discussion, as will be seen in Section 3. Before moving on, however, let us introduce the complementary process of Pre-Cluster Shortening.

2.2 Pre-Cluster Shortening (PCS)

In late OE and early ME, long vowels shortened regularly when followed by a consonant cluster where the second consonant was typically a dental obstruent /t, d, θ/, with the exception of the set of clusters that would otherwise condition HCL and potentially cause maintenance of the long vowel. This process has led to the development of classic alternations in the morphological paradigms of English verbs and nouns, as seen in Table 6 and Table 7.[1] Unlike HCL, segmental properties of vowels and consonants do not appear to strongly condition PCS.

Table 6. PCS in verbal paradigms.

	Old English	Middle English	Present-Day English
/V:Cte, V:Cde/	d**ǣ**lan / d**ǣ**lte	d**ē**len / d**ea**lt(e)	“deal / dealt” [i] / [ɛ]
	c**ē**pan / c**ē**pte	k**ē**pen / k**e**pt(e)	“keep / kept” [i] / [ɛ]
	cr**ēo**pan / cr**ē**pte	cr**ē**pen/ cr**e**pt(e)	“creep / crept” [i] / [ɛ]
	m**ǣ**nan / m**ǣ**nte	m**ē**nen / m**e**nt(e)	“mean / meant” [i] / [ɛ]
	h**ȳ**dan / h**ȳ**dde	h**ī**den / h**i**d(de)	“hide / hid” [aɪ] / [ɪ]

Table 7. PCS in nouns.

	Old English	Middle English	Present-Day English
/V:Ct, V:Cþ/	d**ēo**p / *d**ēo**pþ	d**ē**p / d**e**pthe	“deep / depth” [i] / [ɛ]
	h**ǣ**l / *h**ǣ**lþ	h**ea**l / h**ea**lth(e)	“heal / health” [i] / [ɛ]
	f**ī**f / f**ī**fta	f**ī**fe / f**i**fte	“five / fifth” [aɪ] / [ɪ]
	f**ū**l / f**ȳ**lþ	f**ou**l / f**i**lth	“foul / filth” [aʊ] / [ɪ]

The contrast between the contexts for conditioning HCL and PCS is subtle. On one hand, a short vowel followed by a cluster /ld/ triggered HCL consistently, while a long vowel followed by a cluster /lt/ triggered an inverse process. Both sound changes involve modifications of the quantitative properties of vowels in specific segmental and

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[1] Shortening also occurred inconsistently before /st/, e.g., *blast* < OE *blǣst*, *breast* < OE *brēost*, *dust* < OE *dūst*, *fist* < OE *fȳst*, but cf. *Christ, east, least, priest, ghost, roost,* etc. (Minkova 2014: 212–213).

syllabic contexts, and so any comprehensive account of one phenomenon should ideally make reference to the other.

2.3 Summary

We have reviewed how HCL exhibits different frequencies of application depending on the makeup of the homorganic cluster and the vowel quality of the nucleus. Before the cluster /ld/, vowel frontness is the conditioning feature, with non-front vowels lengthening and front vowels lengthening about half the time. Before the cluster /nd/, vowel height is the conditioning feature, with high vowels lengthening consistently and low/mid vowels remaining the same. Furthermore, whatever phonological system-pressure is responsible for motivating HCL, any account must include the fact that this pressure is removed when an additional syllable of the form CV is present.

Turning to PCS, this process differs from HCL in that it appears to be primarily motivated by the presence of a consonant cluster following a long vowel — a configuration that is historically prone to modification in English — rather than on interactions between consonant and vowel quality. Even so, it should be noted that the set of clusters before which PCS applies generally excludes the set of clusters which condition HCL, namely homorganic clusters terminated by a voiced stop. Thus, in a contrast between /ld, nd/ on one hand and /lt, nt/ on the other, it is interesting that HCL is conditioned by the former (*ċild*, *bind*, etc.), while PCS is conditioned by the latter (*dǣlte, mǣnte,* etc.), among many other heterorganic clusters. This emphasizes the importance of examining the fine segmental makeup of the consonant clusters involved in each process.

3. Prior Accounts

Much has been written about HCL and PCS over the past century and a half, but these processes — HCL in particular — remain a persistent thorn in the side of many accounts. A very brief overview of the assumptions of these accounts will demonstrate why. To be clear, the following discussion does not aim to refute the claims or commitments of these accounts. Many of the theoretical proposals are extremely effective in capturing all kinds of phonological phenomena in Germanic and other languages. What will be demonstrated is that HCL simply does not fit comfortably with any of the major accounts. In each case, HCL either goes against the predictions of the account entirely, or requires additional stipulations in order to be brought into the fold.

PCS, in contrast, fits very well regardless of the theoretical framework chosen. This discussion will set the stage for the preference-based proposal in Section 4.

3.1 Optimal syllable weight and compensatory lengthening

The most widespread class of accounts assumes a kind of phonological homeostasis at the word level. This manifests in various ways, most commonly as an assumption that syllables in Germanic tend towards an “optimal syllable weight” — bimoraicity — and that phonological changes are adjustments toward this ideal. HCL is problematic in this respect, since it involves vowel-lengthening before a consonant cluster even in cases where words are monosyllabic. The environment where HCL applies should not require adjustment toward a bimoraic norm, since it should already contain at least two morae (one from the vowel, and at least one from the coda consonant(s)). PCS, on the other hand, accords with the idea that syllables move toward bimoraicity, since it involves a word with at least three morae shifting toward the bimoraic optimum.

Different proposals attempt to solve the problem of HCL by stipulation: Luick (1889) proposes that homorganic clusters simply count as a single coda consonant, which is therefore extrametrical. If the cluster is extrametrical, this means that the syllable is actually monomoraic, and this leads to lengthening of the vowel: $V_{\mu}CC > V_{\mu\mu}CC$. Nearly identical concepts are echoed by Malsch (1976), Hogg (1992), and Ritt (1994), all of whom locate the motivation for phonological change in the case of both HCL and PCS in concepts of optimality which exist independently from the phonological system. In each case, HCL (but not PCS) is captured by the addition of an exceptional principle (extrametricality of an entire consonant cluster licensed by homorganicity) to the phonological system.

Proposals by Sievers (1901) and Luick (1921) follow a similar path in their accounts but assume that the motivation for lengthening is instead suprasegmental, embodied by a "two-peaked" accentual pattern in Germanic that must be maintained after syncope of unstressed vowels. Although different in application, this accentual approach is, in spirit, the same as "optimal syllable weight" approaches since it incorporates an external ideal or optimum toward which syllables are adjusted. Importantly, however, these accounts also introduce the notion of "compensation" as a motivation for phonological change. This is further developed by Morsbach (1988) and Liberman (1992), who assume that phonological forms and contrasts are maintained by addition of new features or modification of old features in order to make up for elements of phonological representation that have been lost. Such accounts view HCL as "compensatory lengthening" in response to syncope. In particular, Liberman assumes that the first consonant in the homorganic cluster acquires an additional feature — either velarization, palatalization, or extra length — after syncope of final unstressed syllables in Germanic. This feature is eventually transferred as vocalic length to the nucleus because of perceptual pressure to emphasize and/or maximize the stressed nucleus (an idea developed by Phillips 1981).

Compensatory accounts are more effective because they locate the motivation for change in the well-established concept of phonological compensation. However, they leave many questions unanswered. Why are homorganic clusters especially targeted for the assignment of a compensatory feature after syncope? Why is the first segment assumed to carry this feature? In addition, the postulation of a compensatory feature does not explain the difference in frequency of HCL-application to different segmental contexts (/nd/ vs. /ld/) as shown in Section 2.1. Indeed, this problem is shared by all accounts discussed thus far: accounting for the differential behavior of individual vocalic and consonantal segments in the context of HCL poses a greater challenge to accounts which postulate an external optimum, since the number of segment-specific stipulations increases.

3.2 Direct phonetic motivations

With this in mind, we turn to a different approach which seeks an explanation for phonological change as a result of more grounded phonetic principles. Originally presented by Eliason (1948), this approach has gained more currency with work by Phillips (1981, 1983), Minkova & Stockwell (1992), Moon (2004), and Minkova (2014). These authors understand changes in phonological structure to be motivated directly by articulatory or perceptual properties of segments. In the case of HCL and PCS, the phonetic properties of the liquid or nasal are assumed to directly induce lengthening or shortening. Moon (2004) in particular notes that, phonetically, both vowels and liquids have longer duration when they occur before voiced consonants. In addition, Lehiste (1972) claims that vowels and liquids tend to "fuse" into a single timing unit for lengthening/shortening and emphasizes that the articulatory and perceptual properties of segments must be taken into account when discussing these processes.

A phonetic account of HCL fares somewhat better in that it is able to appeal to clear articulatory and perceptual differences between segments. The one significant shortcoming of such accounts is that, while they are fully able to provide detailed descriptions of the phonetic environments in which change is conditioned, conditioning alone does not explain why a change occurs. Such accounts are ultimately missing a crucial motivating factor. For this reason, an account of HCL or PCS which simply states the special phonetic properties of homorganic clusters or the vowels which precede them does not truly provide an explanation, even though it correctly identifies the important contours of the problem (namely, the featural makeup of the segments involved). See Minkova & Stockwell (1992: 196–198) for additional criticism and discussion.

3.3 Syllable Cut

Finally, a parallel class of accounts have looked to a prosodic and typological explanation for HCL, PCS, and many other phonological changes. Starting with Sievers (1901) and developing through Trubetzkoy (1939), Vennemann (2000), Restle (2003), and Mailhammer (2009), these accounts appeal to a notion of "syllable cut": an emergent phonological category established on the basis of strong correlations between segmental and structural properties of syllables. Structurally open syllables (CV.C…) correlate with segmentally long vowels ("smooth" cut) while structurally closed syllables (CVC.C…) correlate with segmentally short vowels ("abrupt" cut), and the pressure to organize syllables into these two newly-established classes provides the motivation for quantitative adjustment.

Other important cues for cut assignment include the nature of the vocalic and consonant segments involved. High vowels, for example, tend to be inherently shorter and therefore regularly cue abrupt cut, while low vowels cue smooth cut. Likewise, a strong or fortis consonant following the nucleus cues abrupt cut, while a weaker, lenis, or high sonority consonant cues smooth cut (Vennemann 2000: 253–254). These principles of cut assignment have been deployed in the literature to address nearly every sound-change involving quantity-adjustment in the history of Germanic languages: open syllable lengthening, closed syllable shortening (with PCS as a subcase), (de-)gemination, etc. (see Riad 1995 for an overview). Because of the broad and comprehensive scope of syllable cut theory, it is worth evaluating the predictions of this framework in some detail.

To begin with, PCS is easily captured within a syllable cut system as an example of the assignment of abrupt cut, since it occurs in syllables which are invariably closed, and the consonants following the vowel in such syllables tend to be strong/fortis (stops, voiceless segments, etc.). This does not necessarily privilege syllable cut above weight-based frameworks, however, because PCS is just as easily captured under assumptions of preferred bimoraicity. On the topic of HCL, Vennemann (2000: 265–267) argues that lengthening before voiced clusters is an example of the application of smooth cut, claiming that the high sonority of the first segment of the homorganic cluster (liquid or nasal) pushes for smooth cut assignment. Because we also find instances of PCS with homorganic clusters consisting of a liquid/nasal + C, this means that the threshold for cut-assignment is actually found in the second segment. When the second segment is voiced (*ċild̲, bind̲an*), smooth cut is assigned (= HCL). If the second segment is voiceless (*dǣlt̲e, mǣnt̲e*), abrupt cut is assigned (= PCS). This seems to work well. However, Vennemann does not address contexts where HCL (a) fails to apply categorically (*hand, band*) or (b) applies inconsistently (*child* vs. *meld, build*). Once we delve into the details of how HCL is governed by vowel quality, we see that, in fact, syllable cut cues makes some incorrect predictions.

Recall that words with /nd/ show categorical lengthening when the vowel is high (*bindan* > *bīnden*), but not when the vowel is low (*band* > *band*). Since high vowels are supposed to cue for abrupt cut, while low vowels cue for smooth cut, the lengthening in these cases is the opposite of what syllable cut predicts. If Vennemann is correct, high vowels should show some resistance to HCL, since they cue for abrupt cut, while low vowels should show no resistance at all, but this is not what we find.

Next, consider words with /ld/, which show partial lengthening when the vowel is front (*ċild* > *chīlde* but *seldan* > *seldom*) and categorical lengthening when the vowel is back (*ald* > *āld*). If low sonority consonants following the vowel cue smooth cut, then we expect that smooth cut should apply more strongly to cases with /ld/, since /l/ is more sonorous (weak, lenis) than /n/. This prediction is indeed borne out for the syllable cut account: HCL occurs more consistently overall with /ld/ than with /nd/. However, a syllable cut account does not provide us with an answer to why front vs. back placement features are relevant in /ld/-contexts, compared with high vs. low elsewhere. Place features do not typically play a role in the cues for cut-types that Vennemann outlines. We could, of course, add a front/back dimension to cut-assignment cues by saying that back vowels cue for smooth cut, while front vowels cue slightly for abrupt cut, but this exposes a weakness in the syllable cut system: simply stating which features cue what does not explain the actual motivation.

To be clear, the main issue that I target here is that a syllable cut account does not clearly explain the *relative* difference between lengthening with high/low vs. front/back. Syllable cut is not a categorical phenomenon and categorical application of cut-types is therefore not to be expected. However, it does make certain predictions about tendencies for cut-assignment. Vennemann (2000: 262), for example, defines the assignment of smooth and abrupt cut in terms of preferred correlations between structural properties of syllables and cut-type. Even though Vennemann does not claim a direct causal link between syllable properties and cut-assignment (e.g., all closed syllables will be abrupt, all open syllables will be smooth), the preferences outlined in his account still lead us in the wrong direction for HCL when it comes to accounting for the role of the vocalic and consonantal segments involved. This does not mean that exceptions to cut-assignment are fatal to a syllable cut account; only that an alternative that appeals to different preferences may ultimately be more successful. Such an account should be able to provide a reason for why front/back is relevant for /ld/, while high/low is relevant for /nd/, while simultaneously capturing the relatively higher application of HCL to contexts with /ld/ compared to /nd/.

3.4 Summary

This overview of different theories leaves many of the details of specific accounts unaddressed, but it highlights the set of questions that every account of HCL and PCS must attempt to answer in some form or another. These questions are listed in (1):

(1) a. What is the motivation for quantitative adjustment (lengthening for HCL, shortening for PCS)?

b. What role do the features of the consonant cluster play? (liquid vs. nasal, voiced vs. voiceless, homorganicity, etc.)

c. What role do the features of the nucleus vowel play (high/low, front/back)?

For many of the accounts, the contrast between PCS and HCL is quite stark. The former is typically very easy to reconcile with basic theoretical assumptions about motivation and readjustment, while the latter consistently requires exceptional treatment. Accounts that center the motivation for such sound changes in the maintenance of moraic minimums, compensation for phonological loss/reduction, or the assignment of innovated phonological categories are inadequate to deal with HCL because they must either (a) make stipulations about the treatment of homorganic clusters in order for HCL to fit with the target (a phonology-external optimum, such as bimoraicity), (b) make incorrect predictions about the application of HCL (as in the preferences for smooth vs. abrupt cut assignment) or (c) postulate featural changes that are not necessarily well-attested or evident on the surface (a velarization/palatalization feature originating after syncope and shifting from C to V, for example).

Accounts which assume a direct phonetic explanation, on the other hand, may appeal to perceptual and articulatory data to explain why lengthening could be allowed in the case of HCL (e.g., articulatory lengthening of vowels and liquids before voiced obstruents), but they do not have much to say about the actual motivations for the change, beyond the fact that the specific phonetic configuration makes change possible.

As noted at the outset, refutation of these accounts is not the goal here, and on balance, most of the issues that have been brought up are by no means crippling to the accounts which they address. The discussion does, however, highlight the consistently exceptional nature of HCL (and, in contrast, the consistently unexceptional nature of PCS) within prior accounts. I believe this exceptionality should motivate us to look elsewhere for the solution to the problem of HCL; a solution which does not attempt to force HCL into an ill-fitting mold, but instead provides an insightful treatment that stands alongside existing accounts. The proposals in the next section, which locate the motivation for HCL in preference-based pressures, provide just such a complementary treatment.

4. Major Proposals

4.1 Preference-based Change

Theo Vennemann (1988) outlines an important theory of "preference laws" governing a variety of cross-linguistic phonological changes. Preference laws are theorems about language change which characterize pressures for change in terms of gradient levels of markedness. Preference laws are not "sound change laws" in the inviolable Neogrammarian sense but are instead derived from observable tendencies of change which appear across languages, with potentially diverse and heterogenous causes. They constitute an attempt at representing the motivation behind sound change in a way that is far enough removed from specific theoretical frameworks as to approach a level of neutrality that is nevertheless still insightful. See Murray & Vennemann (1982,

1983) and Mailhammer, Restle & Vennemann (2015) for further background. As an example of this system, consider two of the preference laws Vennemann proposes:

(2) **The Nucleus Law:** A nucleus is the more preferred…

a. the steadier its speech sound, and

b. the higher the sonority[2] of its speech sound.

(3) **The Coda Law:** A syllable coda is the more preferred…

a. the smaller the number of speech sounds in the coda,

b. the higher the sonority of its offset, and

c. the more sharply the sonority rises from the offset toward the sonority of the preceding syllable nucleus.

These generalizations amount to the observation that (i) the nucleus of a syllable should remain perceptually and articulatorily distinct from the margins of a syllable, and (ii) the coda portion of a syllable should be minimized. Put another way, the combination of the Nucleus Law and the Coda Law predicts that languages should

[2] Vennemann (1988) uses "consonant strength" instead of "sonority". Consonant strength is the inverse of sonority, and the definitions in (2) and (3) have been modified accordingly.

prefer phonological adjustments which maximize the disparity in sonority between the nucleus (high sonority) and the periphery (low sonority). Vennemann relies on the well-established Sonority Hierarchy, tracing back at least to Hooper (1976), as the scale of measurement (see Figure 1).

voiceless stops	voiceless fricatives	voiced stops	voiced fricatives	nasals	liquids[3]	glides	vowels		
							high	mid	low
1	2	3	4	5	6	7	8	9	10
low sonority	→								high sonority

Figure 1. Sonority Hierarchy

Using this scale as a baseline, changes in the structural and segmental properties of syllables can be motivated by preferences in the transition between sonority levels within and between syllable-domains. These preferences (internal to the nucleus or coda, between the nucleus and coda, etc.) frequently involve maximizing or minimizing the sonority of one domain in comparison to another. Importantly, the application of

[3] For our purposes here, I define liquids as the phonemes /l/ and /r/.

such changes is further governed by principles of relative preferability in the language system. Vennemann (1988: 2–3) formalizes these principles as the Diachronic and Synchronic Maxims.

(4) **Diachronic Maxim:** Linguistic change on a given parameter does not affect a language structure as long as there exist structures in the language system that are less preferred in terms of the relevant preference law.

(5) **Synchronic Maxim:** A language system will in general not contain a structure on a given parameter without containing those structures constructible with the means of the system that are more preferred in terms of the relevant preference law.

These maxims make specific predictions about which structures will be subject to change from one stage of a language to another (see example 4) and which structures will be licensed at a given stage of a language (see example 5). The diachronic maxim will be the most relevant for the discussion below. In essence, if at one stage of a language, a particular structure A is less preferable along a certain parameter than another structure B, then A will be more susceptible to elimination or modification than B. With the principles of the theoretical framework established, we may now turn to the question of whether or not quantity adjustment (lengthening, shortening) can be motivated by such preferences.

4.2 Preferability of HCL Contexts

Taking the two preference laws in (2) and (3) into account, along with the elaborated Sonority Hierarchy in Figure 1, we can straightaway evaluate the relative preferability of the phonological environments in which HCL occurs.

First, consider the relevant combination of nucleus and coda, VC. At the extreme end of the spectrum, sequences with high sonority vowels followed by low sonority consonants are preferred (3c). HCL, involves a sequence of a vowel plus a liquid (sonority 6) or nasal (sonority 5). These combinations are less preferred than, e.g., sequences of vowel plus obstruent, but are nevertheless still allowable. In addition, the sequence of vowel plus nasal (VN) is one step better on the scale than vowel plus liquid (VR), since nasals are less sonorous than liquids, yielding greater disparity in sonority between coda and nucleus. Based on this difference alone, we can predict that if an adjustment occurs in the context of VN, it should also occur in the context of VR, unless some other factor intervenes.

Second, consider the sequence of consonants which make up the coda-internal cluster. A sequence of liquid or nasal plus a voiced stop (sonority 3) is less preferable than combinations with lower sonority offsets, such as voiceless stops (sonority 1), by (3b). In addition, the homorganicity of the cluster may influence preferability, but it is unclear how since homorganicity is defined over place of articulation and is not incorporated into the Sonority Hierarchy. We will return to this issue below.

Third, consider the sonority differential between vowels. Low/mid vowels have greater relative sonority than high vowels, and this impacts the preferability of the transition between nucleus and coda. High vowels tend to be shorter and more peripheral than low vowels, and this difference in duration correlates with a difference in sonority (greater duration = greater sonority; see Parker 2002). Therefore, a high vowel in the context of VN/VR is less preferable than a low or mid vowel, by (2b) and (3c). Furthermore, the correlation between duration and sonority leads to another general conclusion: long vowels are higher on the scale of sonority than short vowels in general. This provides an answer to the question of whether preference laws can provide motivation for quantity adjustments: They can, since vowel quantity/duration manifests on the Sonority Hierarchy. Let us now apply these ideas to HCL directly.

4.3 Application to HCL

We have established that the environments where HCL occurs exhibit sequences that are not highly preferable according to the Nucleus and Coda Laws. These environments should therefore experience pressure for adjustment. The means of adjustment can also be justified. A change in vowel quantity is the most minimal change that can be applied in order to alter the sonority differential between nucleus and coda. It also makes sense that the segmental property of vowel quantity would be open for manipulation in late OE specifically, since the breakdown of the quantity system, where distinctions in vowel duration were exploited for phonemic purposes, was already well underway at this point (see Mailhammer 2009). This leads us to the first proposal:

(6) **Proposal 1:** HCL is a response to a non-preferred sonority-configuration involving both the transition from nucleus to coda and coda-internal transitions. Vowel-lengthening increases the vowel's sonority, with the effect that:

a. the nucleus is made more preferable by (2b), and

b. the disparity between nucleus and coda is increased, in accord with (3c).

Let us now consider specific instances of HCL. In the case of the sequence VNC, the proposal plays out straightforwardly. High vowels like /i/ and /u/ lengthen consistently before homorganic clusters with a nasal due to the relative closeness of their sonority levels in comparison to the nasal (OE *blind* > ME *blīnd*; OE *hund* > ME *hūnd*). Mid/low vowels like /e/, /o/, and /a/, on the other hand, are inherently more sonorous, and do not lengthen (OE *spendan* > ME *spend*; OE *hand* > ME *hand*).

The case of VRC is more complex. Lengthening does not apply along the lines of high vs. mid/low, as it does in VNC contexts. Instead, front vs. back is the relevant feature. Lengthening applies with both vowel types /i, u, e, o, a/, but to a lesser extent with front vowels /i, e/. The fact that lengthening applies to some extent regardless of vowel quality, cross-cutting the Sonority Hierarchy for high>low vowels, can be explained by the observation made above with respect to the relative preferability of RC vs. NC: Liquids are higher in sonority than nasals, resulting in more pressure for change in the context of VRC.

A question remains, however: Why are front vowels more “insulated” from lengthening in the case of VRC, while back vowels are not? To answer this question, we must consider the properties of liquid /l/ more closely. Minkova & Stockwell (1992:

199) propose an account of lengthening before the sequence /ld/ that relies on the fact that /l/ in OE (and in most dialects of PDE) is “dark”; in other words, velarized [ɫ]. This attribution of velar properties to /l/ in OE is by no means unique, and in fact has a long history in the phonological tradition. The assumption of a dark-/l/ in OE serves most commonly as a means of capturing the process of vowel “breaking” in prehistoric OE whereby the vowels /æ/, /e/, and /i/ became the diphthongs /ea/, /eo/, and /io/ before consonant clusters consisting of /h, r, l/ and another consonant. Examples with breaking of /æ/ are as follows: OE ***ea***_hta_ ‘eight’, _b_***ea***_rn_ ‘child’, _c_***ea***_ld_ ‘cold’ (cf. Gothic ***a***_htau,_ _b_***a***_rn,_ _k_***a***_lds_). In this context, the velar or “back” nature of /l/ allows the lateral to be grouped together with /h/ and /r/, unifying breaking contexts. For further background and references to dark-/l/ in OE see Luick (1914–1940: §143), Wyld (1929: §102, fn.2), Smirnitsky (1955: §92) (cited by Krupatkin 1970: 50), Howell (1991), Lass (1994: xix), and Huber (2008: 147). Minkova & Stockwell’s (1992) proposal is notable amongst these because it extends the concept of dark-/l/ to HCL-contexts in particular.

In the context of (6) above, I will incorporate Minkova & Stockwell’s idea by exploiting the fact that velarization is specifically a feature of place (i.e. backness) and may therefore interact with vocalic features like frontness and backness. With this in mind, consider the second proposal below:

(7) **Proposal 2:** Velarization of /l/ introduces an additional effect alongside sonority, an interaction between [velar] and [+/– front].

a. [+front] vowels contrast more strongly with [ɫ] in terms of place

b. [– front] (i.e. back) vowels do not contrast with [ɫ]

According to (7), pressure for change still exists in the sequence /VlC/ due to the high sonority of /l/, but [+front] vowels maintain an additional contrast with [ɫ], resulting in more disparity between nucleus and coda, and a lower frequency of lengthening: OE *ċild* > ME *chīld*, OE *feld* > ME *fę̄ld, feeld*, alongside unlengthened *build, meld*, etc. Back vowels, on the other hand, are less preferred in /VlC/ contexts both on the level of sonority and on the level of [+/– front], so lengthening is much more consistent: OE *ald* > ME *āld*; OE *cald* > ME *cāld*, etc.

In effect, (7) holds that place of articulation is also relevant for the preferability of transitions in the syllable. This naturally extends to the homorganic nature of the consonant cluster. Homorganicity of a coda cluster would be less preferable in monosyllables where both consonants are forced into the same syllable-domain. This provides an additional motivating factor, although one that may be mitigated somewhat by the fact that many of the contexts in which HCL applies are modulated into polysyllabic forms by morphological paradigms. Thus, homorganicity cannot be the prime motivator for HCL, and, accordingly, I focus attention on the featural composition of vowels and consonants instead.

Ultimately, appealing to a special featural property of /l/ allows us to (a) explain the exceptional behavior of HCL in contexts with /l/ (i.e., incomplete application of HCL) and (b) explain why the features [front/back] are relevant in /ld/ contexts, unlike in /nd/ contexts where [high/low] is relevant. Postulating a [velar] feature on /l/ neatly addresses both of these factors while also fitting into the larger picture of sound changes like breaking. On these grounds, I believe it is justifiable and moves our understanding of HCL forward.

4.4 Application to VCCC contexts

Recall that HCL is blocked when the homorganic cluster is followed by an additional consonant. Thus, OE *ċild* becomes ME *chīld* but OE *ċildru* becomes ME *children*, not *chīldren.* As discussed previously, it is the full complex of short vowel (V) plus liquid/nasal (R/N) plus homorganic voiced stop (C) that induces lengthening. Therefore, if we adopt the preference-based account, blocking of lengthening by an additional consonant must be tied to the influence of the added C on the preferability of the environment. Since HCL applies in both monosyllables like OE *ċild* and disyllables like OE *bindan*, it appears that both VRC#/VNC# and VRCV/VNCV contrast with VRCCV/VNCCV. Something about the addition of another consonant after the homorganic cluster improves the preferability of the environment enough that the pressure for lengthening is removed.

There are two options to account for this within the preference law system. The first option is that the pressure for lengthening may be removed by principles of syllabification in OE, whereby sequences of obstruents and liquids are typically tautosyllabified, especially if the liquid is /r/ (see Lutz 1986: 200). Thus, sequences like /VldrV/ and /VndrV/ syllabify as /Vn.drV/ (*ċil.dru*) and /Vn.drV/ (*sun.drian*). This means that a syllable-boundary breaks up the homorganic cluster, and this intervention introduces a new set of pressures governed by different preference laws; namely, the Syllable Contact Law (Murray & Vennemann 1983). For reasons of space, I will not delve further into the preferences involved in syllable contact, only noting that differences in syllabification can account for the non-application of HCL in this case. A further consequence of this approach is that it must be assumed that HCL in disyllabic words is facilitated by analogy either from a monosyllabic base or from a base where the homorganic cluster is tautosyllabic in the first syllable.

The second available option is to appeal again to the featural makeup of the segments involved in VRCCV and VNCCV contexts and the relative preferability of the environments of syllable domains. It should be noted that the consonant which is added is /r/ in nearly all cases. Furthermore, the preferability of syllable-domains in words like *ċild* and *bindan* is such that there is pressure for change, as evidenced by application of HCL. At the same time, it is notable that the adjustment itself ends up targeting the stressed vowel. Considering the details of the Coda Law and its inverse, the Head Law for onsets, adapted from Vennemann (1988: 13) in (15) below, shows that the transitions internal to the coda in *ċild* and the transition from the first to the second syllable in *bindan* are actually preferable. It makes sense, then that the nucleus is what would be targeted for change in these cases.

(8) **The Head Law:** A syllable head is the more preferred:

a. the closer the number of speech sounds in the head is to one,

b. the lower the sonority[4] value of its onset, and

c. the more sharply the sonority rises from the onset toward the sonority of the following syllable nucleus.

Turning now to the cases with added /r/, it can be seen that, according to the Head Law, the configuration /drV/ is relatively less preferred because of the gradualness of the transition in sonority from /d/ (sonority 3) through /r/ (sonority 6) to the nucleus of the following syllable (sonority 8–10). It is possible that this relatively lower level of preferability in the second syllable may actually alleviate the pressure for change in the stressed syllable. Since both syllables are generally mediocre in terms of preferability, neither one undergoes adjustment. In contrast, if no /r/ is added, the distinction between the less preferable nature of the stressed syllable and the more preferable nature of the unstressed syllable leads to higher pressure for change. If this idea is adopted, analogical lengthening between monosyllables and disyllables in morphological paradigms could go in either direction. In effect, the proposal here is

[4] Vennemann again uses "consonant strength" here, which I have adapted to "sonority".

that the pressure for change can be relativized to domains larger than the syllable; the preferability of the entire word is taken into account.

Ultimately, whichever option is chosen, we have a preference-based means of accounting for the effect of an additional consonant on the preferability of transitions from the stressed vowel to the liquid/nasal, from the liquid/nasal to the homorganic voiced obstruent, and the transition into a following unstressed syllable.

4.5 What about Pre-Cluster Shortening?

Unlike HCL, PCS shows very few of the context-sensitive properties that modulate the application of lengthening beyond the presence of a consonant cluster. Many different sequences of vowel plus cluster sequences are found, with the only gap being those covered by HCL: a liquid/nasal followed by a voiced homorganic stop. The majority of PCS cases involving a homorganic cluster such as /lC/ or /nC/ have a second consonant with lower sonority than voiced stops: OE *fȳlþ* > *filth*, OE *dǣlte* > *dealt*, OE *mǣnte* > *meant.* This prevents any of the pressures involved in HCL from arising, and PCS applies instead.

In the absence of HCL, what motivates shortening? Many of the accounts referenced in Section 2 could fit with the preference-based account articulated above. For example, accounts based on the concept of optimal syllable weight (=bimoraicity) views sequences of long vowels plus consonant clusters in monosyllables as "super-heavy" and therefore prone to shortening. In fact, Vennemann (1988: 30) incorporates such an account into a proposed preference law: the Weight Law (="Prokosch's Law," Prokosch 1939: 140), adapted below.

(9) **The Weight Law:** In stress accent languages an accented syllable is the more preferred, the closer its syllable weight is to two moras, and an unaccented syllable is the more preferred the closer its weight is to one mora. (The optimal stress syllable is bimoric, the optimal unstressed syllable is unimoric)

A reviewer points out that, if the preference-based account of HCL is adopted, it should predict that an approach to PCS based on optimal syllable weight is incorrect, since if optimal syllable weight pressures exist for PCS they should also exist for HCL. This is not necessarily the case, however. If we adopt the most basic approach to understanding metrical weight in Germanic languages (i.e., all segments are associated with morae except for a word-final consonant, which may be extrametrical), then, at most, HCL-contexts involve an instance of a heavy syllable VC-C. Thus, the prediction of optimal syllable weight systems should be that HCL-contexts are already optimal and do not need adjustment. Preferences for syllable-internal prosody transitions may then take over and play a role in influencing vowel quantity.

The question then becomes: what about after the adjustment? Even if HCL applies unmotivated by syllable weight, it will fall into non-optimal territory as soon as the vowel is lengthened, and then the prediction is that it should undergo shortening again immediately. Leaving aside the fact that there are many instances where HCL is indeed reversed in ME, if we wish to preserve an account that countenances optimal syllable weight as a motivator for phonological change, then, in essence, we must assume that pressures stemming from optimal syllable weight may be outweighed by pressures stemming from syllable-internal transitions.

Alternately, as noted in Section 3, a perspective based on syllable cut would view the environment of PCS as a prime candidate for the assignment of abrupt cut due to the closedness of the syllable structure and the presence of a strong/fortis consonant following the syllable nucleus (see Murray 2000 for further discussion of "Closed Syllable Shortening"). The crucial factor, in light of the preference-based proposal for

HCL, is that PCS-cases have none of the dispreferred configurations that lead to HCL. The transitions from nucleus to coda and coda-internally are relatively preferable, and so the cause of shortening must be independent of the process which causes lengthening.

5. Conclusions

In this paper, I have proposed an account of the process of Homorganic Cluster Lengthening in Early English based on the system of preference laws articulated by Vennemann (1988) and located with respect to the inverse process of Pre-Cluster Shortening. This account was articulated in the context of some guiding questions that all such accounts must answer (repeated from 1):

(10) a. What is the motivation for quantitative adjustment (lengthening for HCL, shortening for PCS)?

b. What role do the features of the consonant cluster play? (liquid vs. nasal, voiced vs. voiceless, homorganicity, etc.)

c. What role do the features of the nucleus vowel play (high/low, front/back)?

The basic assumptions of this account are that HCL is motivated by a dispreference for specific aspects of the segmental and syllabic makeup of the environments in which it occurs. In particular, the high sonority of the liquid or nasal constituting the first segment of the homorganic consonant cluster is dispreferred in general by the Coda Law, and the relative closeness of sonority between the liquid/nasal and the following voiced obstruent is also dispreferred. This provides a direct answer to the guiding question of motivation for HCL in (10a) above.

The first proposal is that lengthening of the vowel functions to increase the sonority of the syllabic nucleus, thereby improving the preferability of the transition between the nucleus and coda. When the homorganic cluster is the form nasal + voiced obstruent, this lengthening occurs categorically for high vowels, but not for mid/low vowels, in accord with the generally higher inherent sonority of mid/low vowels compared to high vowels. When the cluster is of the form liquid + voiced obstruent (/lC/ specifically), lengthening affects both high and mid/low vowels, with the property of frontness cross-cutting the application of lengthening instead: back vowels lengthen consistently, while front vowels only lengthen sporadically. This accords with the fact that /lC/ is relatively less preferable than the clusters with nasals due to the higher sonority of liquids, leading to higher pressure for change lengthening overall. The second proposal of the paper is that frontness/backness plays a mitigating role in /lC/ contexts, since /l/ in Old English is velarized, a feature correlating articulatorily with vowel backness. This provides an additional contrast between front vowels and /l/, leading to sporadic lengthening of front vowels instead of the categorical lengthening experienced by back vowels. This provide answers to (10b) and (10c) on the features of the consonant cluster and the nucleus vowel, respectively.

The blocking effect introduced by the addition of another consonant after the homorganic cluster is also discussed in preference-based terms. Two options are proposed, one appealing to principles of syllabification and “syllable contact” which intervene to eliminate the context in which HCL would otherwise apply, and the other relying on the notion that the addition of another consonant /r/ lowers the overall preferability of both the stressed and unstressed syllables in question, ultimately cancelling out the pressure for HCL. Finally, Pre-Cluster Shortening is placed in contrast to HCL and ultimately attributed to more general pressures that have been proposed and articulated elsewhere (optimal syllable weight, syllable cut assignment, etc.).

It remains to be seen if the preference-based account of HCL is truly more successful than other proposals, especially from a cross-linguistic perspective. It should be noted that a preference-based account has two advantages compared to other proposals. First, it accounts for the somewhat narrow and peripheral application of HCL compared to other widespread sound changes like Open Syllable Lengthening by locating the motivation for change in the *relative* preferability of sonority transitions. The transition between nucleus and coda in HCL-contexts (i.e. vowel to liquid/nasal and liquid/nasal to voiced obstruent) is less preferable than other contexts, but it is hardly the least preferable context imaginable, according to specifications of the Sonority Hierarchy. Therefore, the changes that apply are not necessarily categorical for all words that exhibit the right configuration. Inconsistency is allowable, in line with the Diachronic and Synchronic Maxims.

Second, the preference-based approach makes the right predictions on the scope of application of HCL: the configuration VNC is slightly more preferable than VRC, so if VNC is enough to trigger an adjustment, the same adjustment should apply even more strongly in VRC. This is exactly what we find when comparing frequency of application in contexts with a nasal versus contexts with /l/, modulo the effects of velarization.

Other accounts of HCL, such as the optimal syllable weight approach, are forced to introduce exceptional principles, like allowing the homorganic cluster to function as a single segment for the determination of extrametricality, in order to bring HCL into the fold. But this has the effect of “normalizing” HCL when it should not necessarily be normalized due to its limited and peripheral application. Accounts which appeal to a direct phonetic explanation of HCL also suffer from issues related to the motivation for change. In particular, although segmental lengthening of vowels and liquids is clearly observed in HCL contexts, it seems to predict that such lengthening should phonologize much more easily, if this is indeed what allows lengthening to occur, and it seems to predict that HCL should be a more widespread crosslinguistic phenomenon.

In the end, an explanation of the processes of sound change in Early English and elsewhere requires insights from multiple accounts in order to succeed, and so it is not my goal to dismiss prior proposals. Instead, the goal of this paper has been to present an additional possibility for understanding HCL in the form of preference-based motivation, which has made valuable contributions elsewhere. To the extent that this is successful, I believe the account articulated here offers a useful addition to the well-worn discussion of phonological change in the history of English.

Abbreviations

HCL	Homorganic Cluster Lengthening
EME	Early Middle English
ME	Middle English
lOE	late Old English
OE	Old English
PCS	Pre-Cluster Shortening
PDE	Present Day English

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