Early metrical and lexicographical evidence for functional stress-shifts

DONKA MINKOVA and Z. L. ZHOU
University of California
(Received 29 October 2021; revised 23 January 2022)

Only three English diatones, outlaw, rebel, record, out of the current 235-item list in Hotta (2015), are on record prior to the seventeenth century; the latest record of diatonic outlaw is 1786 (Sherman 1975: 63). Whether this type of functional prosodic contrast was inherited or innovative is controversial. We revisit the Old English metrical evidence for functional stress-shifting and present new attestations of verb–noun pairs in Middle English verse in an effort to establish if the limited inherited stress-shifting model survives, and, if so, whether or how it accommodates the incoming loan vocabulary. The additional verse attestations support the idea of continuity, yet the scarcity of data falls short of statistical verifiability. A search into detailed lexicographical information for 1200–1550 reinforces the hypothesis of continuity by documenting the differential patterns of borrowing of nouns and verbs, prefixed and unprefixed. Taken together, these two sources endorse a proposal that in its earliest stages functional stress-shifting was predicated on prefixation, and that the ongoing conflict between prefixal defooting and ALIGN-L (Root, PrWd) in ME is a necessary component of the diachronic account of English prosody.

Keywords: noun–verb diatone(s), prefixation, stress, Middle English verse, lexicographical records

Two thyngys owyth euery clerk
To aduertysyn, begynnyng a werk,
If he procedyn wyl ordeneelly:
The fyrste is ‘what’, the secunde is ‘why’.
Osbern Bockenham (1393–1447?)
Legendys of Hooly Wummen

1 Sincere thanks to our reviewers for their extraordinary collegial commitment and generosity; their sharp, insightful, helpful comments could only have come from colleagues who know and value the article’s subject. The final product is better for their contribution, the imperfections are all on us.
Introduction: the what and the why of the project

The prosodic contrasts in pairs such as *upset*, n. – *upsét*, v., *convict*, n. – *convíct*, v. are known as functional stress-shifts, also referred to as diatones. In some estimates (Dabouis et al. 2014; Kiparsky 2016: 467) about 30 percent of the eligible homographic noun–verb pairs in Present-Day English (PDE) can alternate. Whether this type of prosodic contrast was an Old English (OE) inheritance, or a post-Middle English (ME) innovation is controversial, not least because some pieces of the diachronic account of English stress are missing and worth revisiting. So, one answer to the ‘what’ of this project are some lacunae in our records of pre-seventeenth-century stress with focus on functional stress-shifting.

The ‘why’ rationale of the endeavor is that verse evidence for possible prosodic changes in English is conspicuously absent from the records of the post-Chaucerian stretch of about 150 years. Halle & Keyser’s foundational 1971 account of stress in early English verse jumps from Chaucer to Shakespeare and Milton, and so does the section on ‘Accentuation’ in Lass (1992: 89–90). Dobson’s coverage of stress (1957, vol. II: 445–9) starts at 1500, officially, but his first relevant comments are to the late sixteenth century when the first English–English rhyming dictionary appeared (Levins 1570). The testimony of orthoepists before the end of the sixteenth century (Dobson 1957, vol. II: 827–30, 1020–2) is mostly silent on stress, and the relevant section in Lass (1999: 128–33) also picks up from Levins’ (1570) *Manipulus Vocabulorum*. Further, even diachronic dictionary-based searches for diatones (Dabouis et al. 2014; Hotta 2015) focus on post-sixteenth-century information. The otherwise valuable testimony of spelling is of little use for stress reconstruction; art verse remains the most promising source of prosodic information diachronically, so one of the aims of this study is to examine the way poets treat stress, and more narrowly, to attempt an extended record of the attestations of prosodic contrasts based on lexical category: nouns versus verbs.

Turning to the rapidly expanding ME lexicon, and especially late ME (1400–1550), we also present new records of the noun–verb pairs in an effort to see if the limited inherited stress-shifting model survives, and, if so, whether or how it accommodates the incoming loan vocabulary. The early history of differential stressing of nouns and verbs is discussed in the larger context of morphological versus phonological factors prior to the first contemporary records of stress (Levins 1570). A renewed scrutiny of the data on early functional stress-shifting relates directly to a widely held view of the evolution of the parameters defining the direction of stress assignment in PDE, as elaborated in section 5, and highlights some of its problematic aspects.

The outline of the article is as follows. Section 2 presents evidence for the differential stressability of prefixed OE nouns and verbs. Section 3 adduces stress-shift data extracted from the ME poetic corpus, including a range of previously unidentified attestations. The relevant lexicographical records in the *Dictionary of Old English* (DOE) and the *Oxford English Dictionary* (OED) are presented in section 4, which explores the morphological and phonological properties of pairs recorded up to 1550. The discussion in section 5
reconsiders the continuity of functional stress-shifting, the link between prefixation and the rise of diatones after the middle of the sixteenth century, and underscores the effect of verbal prefixation on the changing balance between morphological and rhythmic components in the history of stress assignment. Some implications and prospects for further research are addressed in the final section.

2 Old English stress and noun–verb prosodic contrasts

In OE, primary stress falls on the first root syllable, marking the left edge of the semantic core of the word. This model of stress assignment, familiar from inherited vocabulary as in *búsy, kétte, bróthé, òpén, útter*, and historically shared with all other Germanic languages, is known as the *Germanic Stress Rule* (GSR). In OE it also applied to loanwords, often against the stress in the donor language: OE *ábbót*, Lát. *abbátum* ‘abbot’, OE *cáldem’, Lát. *kalendae* ‘first day of the month’, OE *cándel*, Lát. *cándelae* ‘candle’, OE *cúmin*, Lát. *cumínum* ‘cumin’. All accounts of OE stress, including accounts based on the moraic trochee, acknowledge that OE primary stress falls on the first syllable of the root regardless of its weight.

Inflectional suffixes do not affect primary stress. Derivational suffixes, even if they are transparently derived from independent roots, either etymologically or synchronically, e.g. (-)hádd ‘-hood’; (-)lēas ‘-less’; (-)líc ‘-like, -ly’; (-)týne ‘-teen’, never shift the primary stress away from the base, though they may have secondary stress. The non-occurrence of primary stress on suffixes applies to all word types:

(1) Suffixation and primary stress in Old English:

| Suffixation and primary stress in Old English: |
|-----------------------------------------------|
| cýrice            | ‘church’, cýric-líc, cýric-hádd |
| dúru             | ‘door’, dúru-lēas |
| fēower           | ‘four’, fēower-tig, fēower-týne |
| býrman           | ‘to burn’, býr-ende |
| hêפen            | ‘heathen’, hêpen-isc, hêpen-nes, hêpen-sceipe |

The stability of primary stress is testable in the verse: suffixed forms may behave like compounds, allowing the suffixal syllable to fill a metrical ictus, yet that syllable’s onset does not alliterate by itself, indicating that it could not have held primary stress. Put differently, the primary stress-shifts triggered by Latinate suffixes as in *Látin – Latin-ity, pérsón – persón-ify, dráma – dramá-tic*, a central feature of English stress today, are all post-OE innovations.

Prefixation presents a more complex picture. OE treated prefixed items differently depending on the stem’s morphological class. Though often posited (Campbell 1959: 30–1; Hogg 1992a: 48–9), scribal evidence for prefixal allomorphy, e.g., ánd- vs. on-, bi(ð)- vs. be-, in- vs. in-, depending on whether the prefix is attached to a nominal or verbal/adverbial base, is inconsistent (Minkova 2008: 26–7), leaving verse as the best source of information on prefixal prominence in nouns and verbs. Simplifying somewhat, there are three types of prefixes in OE: (a) prefixes which are never stressed, nor used in alliterating positions (*be-, ge-, for-*) ; (b), stressed adverbial
prefixes which were originally attached to nominal stems (and- ‘against’, ed- ‘back’), and
the verbs derived from them preserved the stress contour; and (c), prefixes which were
stressed variably depending on the word class of the base:2

(2) Variably stressed prefixes in OE: æt-, of-, in-, on-, wiþ-, ymb-.3

æt ðam ætstæalle / ǽores mónnenes (Waldere 21)
ket ond fólna. / ÚFórd near ætstóþ (Beo 745)
þær him ñaglæca / ætgrēpe wearp (Beo 1269)
He þæ his fóndas sloh / and him ætfeíst eac (Paris Psalter 77.184)
oð þæt him æghwylec / þæra ymbssítendra (Beo 9)
sylf in þám sólere, / and ymbséteð útan (The Phoenix 204)

The prefix æt- in the nouns ætstæalle ‘station, position’ in Waldere 21, or ætgrēpe
‘grasping, aggressive’ in Beo 1269 has primary stress and alliterates, while in
the inflected verbs ætstóþ ‘stopped’ in Beo 745 and ætfeíst ‘cast/inflict hurt on’
cannot alliterate; similarly, ymb- in ymbssítendra (of) the neighboring people’ has vowel
alliteration, while inflected ymbssétedo ‘surrounds’ alliterates on [s-]. Nouns (and
adjectives) derived with the prefixes in (2) are thus not subject to ‘prefix defooting’
(Selkirk 1980).

OE verse supports an assumption of some degree of prosodic distinction of any
unemphatically used nouns versus verbs; we return briefly to this in section 6. Further
details aside for now, scholarly opinions converge on one point: functional contrast can
be reconstructed beyond doubt only for prefixed items as in (2). They present the key
metrical evidence for positing prosodic prominence asymmetry between finite verbs and
other lexical words in OE, an asymmetry attested and much tested and discussed for PDE.4

3 Stress-shifts in pre-1550 verse

From the earliest strictly stress-alternating septenarius poems, through the blossoming of
the tetrameter, and Chaucer’s and Gower’s innovative pentameter, prefixes on Germanic
verbal bases remain uniformly unstressed. Newly borrowed non-Germanic prefixed verbs
fit into the native framework; monosyllabic prefixes such as ad-, co-, ex-, pre- solidified
and expanded the already well-established native pattern.5

2 While the prosody of adjectives aligns with nouns, for reasons of space we mostly address nouns vs. verbs here. We
exclude non-monosyllabic prefixed elements: ofer-, under-, umbe-, wiþer-. Their prominence relative to the stems
they attach to cannot be reliably tested in the tetrameters and pentameters of ME; besides, umbe- and wiþer- were
unproductive in ME. The main criterion we consider for what constitutes a prefix and what constitutes a particle is
separability: in the verse separable particles can fill an ictic position.
3 Alliterating onsets are in boldface. Further noun–verb stress contrasts in OE verse are recorded in Minkova (2008).
4 For discussion and statistics on the prosodic unevenness of verbs and nouns in PDE see, e.g., Sherman (1975), Kelly
& Bock (1988), Burzio (1994), Berg (1999, 2000), Hurrell (2001), Schlüter (2005: 40–2, 60–4), Sonderegger
(2010/2016), Sonderegger & Niyogi (2013), Smith (2016), Hofmann (2020).
5 We treat etymologically prefixed items in ME as having transparent prefixes, following the OED headword
eytologization. This includes Anglo-Norman (AN) and Old French (OF) items for which the prefix-stem
boundary may have been opaque from the start (e.g. rebel, n., v.; profit, n., v.; promise, n., v.; envy, n., v.; exile,
Continuity of $\# \sigma \dot{\sigma} (\sigma) \#$ for prefixed verbs in ME.\footnote{We follow the common editorial practice of under-dotting presumed ‘silent’ <e(-)>’s line-internally.}

(a) Germanic prefixes and stems

& swá bilámmþ patt wíddwe pá \hspace{1cm} (Ormulum 8681 c.1180)
Sché wíþbráid and fél vpríþt. \hspace{1cm} (Arth. & M. (Auch) 8449 c.1330 (?a.1300))
Men máy the óld èatrénne and nótt atréde. \hspace{1cm} (Chaucer CT KnT 2449)
Béuþ is swérd anón vpswápte \hspace{1cm} (Bevis (Auch) 95/1899 1330 (?c.1300))

(b) Latinate prefixes and stems

It tó corrécẹ and éc to rúbbe and scrápe \hspace{1cm} (Chaucer Adam 6 c.1385)
If théy presúmed mé to cóuntreféte \hspace{1cm} (Chaucer CT PhyT 18 c.1390)
Wheróf the Gréks afférmẹ and séie \hspace{1cm} (Gower Ca (Fr 3) 5.857 a.1393)
Texité mén to yíue fáls credénce \hspace{1cm} (Lydgate FP (Bod 263) 4.3447 (?a.1439))

The usage recorded in (3) may seem like an effort to show the obvious, but the single most extensive documentation of stress-shifts in late ME verse (Nakao 1977: 33–4, 105–6) uses rhymes and marks stress on verbal prefixes (bêwrappen ‘bewrap’, púrsu ‘pursue’, pórvey ‘purvey’) based on examples from ME alliterative verse; this then becomes part of the argumentation against the existence of noun–verb diatones in ME. We believe that both rhyme- and alliterative attestations should be left out of the evidential basis.\footnote{Nakao’s extensive database (1977: 13–130) is is thus of limited usefulness; he follows Halle & Keyser’s (1971) methodological misstep of relying on rhyme for $\sigma \dot{\sigma} (\sigma)$ and alliterative evidence for $\sigma \dot{\sigma} (\sigma)$ stress reconstruction. The problems of using rhyming as evidence for ME stress are discussed in Minkova (1997); increased non-oral text composition and transmission renders ME alliteration unreliable; see Minkova (2009: 99–101) and references there. We look only at non-line-final attestations in tetrameter and pentameter verse and treat as inconclusive rare alliterative verse attestations as, e.g., project, n. in On fe propurest of proiecte þat euire prince bere (Wars Alex. (Ashm 44) 3332 c.1450).}

Recognition of the persistence of $\# \sigma \dot{\sigma} (\sigma) \#$ for prefixed verbs still leaves open the question of the coexistence of noun–verb prosodic contrasts in ME. For the native lexicon, the only Germanic noun–verb pair recognized as a diatone in Levins (1570) is outlaw, OE ùtlàga. The first possible $\# \sigma \dot{\sigma} (\sigma) \#$ record for the verb is post-1400 and it can be ambiguous in the verse, in line with the treatment of compounds in stress-alternating verse. Searching for further contrasting noun–verb pairs is prohibitively time-consuming – the Middle English Dictionary (MED) allows no search option for ‘verse’ attestations – without the development of specialized tools.\footnote{Thanks to one reviewer for making us aware of the existence of one potential tool: the RNNTagger described in Schmid (2019). Schmid’s results are promising, with ‘the accuracy… comparable to that of the manual annotation’. Nonetheless, there exists no pretrained model for ME and so we must leave this possibility to future work.}

Still, the placement of the boldfaced nouns in (4) would be hard to account for unless we assume continuity of at least optional functional stress-shifting; a (?) is added after a line if an alternative scansion cannot be ruled out.

n., v.). We have no access to the way speakers perceived them, but we hypothesize that by contravening the transparent model of non-initial stress on prefixed items they must have played a role in expanding the diatonic set. We refer to noun–verb pairs as ‘homographic’, following the OED headwords; for the ME data we use the variant spelling for the cited line.
(4) Noun–verb possible early Germanic, or mixed etymology, diatones:

(a) Germanic stems:

Seint Dúnsan wás of Éngelónd incóm of góde móre  
(St. Dunstan, Harl 2277, 57, c.1305–10)

At þé incóm of þe fírth monét,  
(Ioséph him wént to názaréth)  
(Cursor (Vsp A.3)11127 a.1400 (a.1325))

of wám we béoþ of-sprónge  
(Lazamon Brut (Otho) 13185b c.1300)

And ál his of-spring fórth with-ál.  
(Havelok (LdMisc 108) 2565 c.1300)

Ánd thou wér ẹ outláwd ẹ ther-fóre (?)  
(Lyddate (7S a g e s 2964 a.1450)

And át the lást, this outlaw stóde  
(Metrical Homilies fourteenth cent.)

Fortún ẹ mysháppyng mákith mén to sé (?)  
(Chaucer Rom(Hunterian) 5543 a.1425 (?a.1400))

Schal hé his mishap wite mé  
(Owl & N. (Clg A.9)1249 c.1275 (?c.1250))

Iésus wás vp-stéi til héuen  
(Cursor (Vsp A.3)18863 a.1400 (a.1325))

Éfter þé vpstei ọ ã pat drightin (?)  
(Cursor (Vsp A.3)20831 a.1400 (a.1325))

Hé vpős and ọs förbóuʒte  
(Castle Love (1) (Vrn)1414 c.1390)

Abide þóu min vpíst, òóu be hónged.  
(7 Sages (1) (Auch)70/1639 c.1330)

(b) Mixed etymology:

The blóod outcry on your cursed déde  
(Chaucer PrT B.1768 c.1390)

Ál the wórld outcry on vs twéyne  
(Lyddate FP (Bod 263)1.7005 ?a.1439)

Mák an outcry on hir dóbilnésse  
(Lyddate FP (Bod 263) 2.71?a.1439)

Gret cáus hau ọ an outcry fór to make  
(Lyddate Minor Poems II 504 a.1449)

In some of these pairs the verbal prefixes have subsequently become particles: come in, spring off, rise up, or the lexeme is obsolete: †upstty ‘resurrect’, but note that diatonic outcry (4b) is attested long before its assumed first date, mid-nineteenth century (Hotta 2015). Looking for more potential Germanic noun–verb contrasts, e.g., upcast, upset, upbrud ‘reproof’, uphold ‘support’, uplift, upspring ‘sunrise’, outcome, outryde, outfar ‘expedition’, outgate ‘exit’, outstrai ‘deviation’, has not been revealing; even if a pair
is attested pre-1550, the stress placement is not recoverable. The pickings are slim; nevertheless, the attestations in (4) clearly duplicate the OE pattern in (2).

For the non-Germanic portion of the lexicon, the only surviving diatones identified in Levins (1570) are rebel and record; the non-surviving ones are depute, divine, mischief, quarrel.

A manual search in the OED, the Corpus of Middle English Prose and Verse (https://quod.lib.umich.edu/c/cme), as well as individual texts, yields attestations of noun-initial versus verb-final stress in verse that have not previously been considered potential inputs to the later history of diatones. The examples in (5) and (7) are arranged roughly chronologically by the date of the # ó σ # noun:

(5) Possible early Latin/Romance diatones:

| Example | Textual Source |
|---------|----------------|
| So þóu respité þi sónes líf | (Seven Sages (Auch.) (1710) c.1330) |
| And ȝif him réspite óf his bále | (Seven Sages (Auch.) (691) c.1330) |
| The quén textile and slén hir childre twéyne | (Lydgate FP (Bod 263) 4: 3409 ?a.1439) |
| Hóu her king en éxile ȝéde (?) | (Sir Orfeo (493) c.1330) |
| Whan mén conséilliid wél, y hérde it náght(?) | (Hoccleve ASM 311?c.1422) |
| By ál the cónseil ãnd the báronáge | (Chaucer KnT A.3096 c.1385) |
| Tó conquést the lánd all hálelý | (J. Barbour Bruce xvi. 315 1487 (a.1380)) |
| That nédés tó the cónquest of Ytáyle. | (Chaucer LGW 1298 c.1430 (c.1386)) |
| He cástę, and háth compássed òfte | (Gower CA 7, 2252 (a.1393)) |
| Fór to fést, wit cómpas sléí | (Cursor (Vsp A.3)8797 a.1400 (a.1325)) |

10 Compare the verb in ‘Of yóure hért ëp cásteth thé viságe’ (Chaucer Tr 5.1838 [c.1385]), yet the earliest OED record for (testable) úpcast, n., is 1616; similarly, outrýde, v. The noun upset ‘revolt’ is attested in the fifteenth century (1463-4, ‘Upset n.’ Dictionary of the Scots Language. www.dsl.ac.uk/entry/dost/upset_n.; accessed 3 September 2021) but only in prose; the current meaning of upset, n. is nineteenth century. The verb upsét is attested in verse since c.1440 (OED).

11 A reviewer asks if there are examples of non-rhyme nouns following the verbal iambic pattern in verse, or even of verbs following the trochaic nominal pattern in the poetic records, and the answer is yes, thus:

| Example | Textual Source |
|---------|----------------|
| For pár-of will i cónsail mé. | (Cursor (Vesp)13151 a.1400 (a.1325)) |
| Here-ôf in cónsail sûld þai spék | (Cursor (Vesp.) 10696 a.1400 (a.1325)) |
| Bot fótto cónselle ôf mi péines | (Gower CA (FrF 3)4.3464 a.1393) |
| That dái mai nó cónsail aváile | (Gower CA (FrF 3)2.3415 a.1393) |
| We seek to establish stress variables, but the low numbers do not allow meaningful quantification. |

12 Earlier attested verb forms are trisyllabic; stress on the middle syllable is the default, e.g. Out of lond exíled him, Roland and Vernagu (39) (c.1330)

13 The OED dates both noun and verb exile c. 1300. Chaucer uses exile, n. only in the prose Tale of Melibee (x2). The prefix was non-separable from the Latin stem; similarly envy.

14 Both examples illustrate the obsolete meaning of the noun as ‘artifice’ and of the verb as ‘to contrive’ (OED).
Þou schóldest ús présénte & gýve
A présént wé havé bróght in hýe

(Chaucer TC 5.234 a.1425 (c.1385))

Who kán confórtë nów youre hértës wérrë?
Good hôpe such cómfort háth hym yíve

(Chaucer Rom (Htrn 409)2760 a.1425 (?a.1400))

I nýl envýê nó virgínitée (?)
Thórgh al érth of énvy èn dèbáêt

(Chaucer WB. D.142 c.1395)

Isolating un-paired # σ σ (σ) # prefixed verbs, or # σ σ # prefixed nouns, in, roughly, pre-1400 records yields more examples, see (6). These cannot be considered ‘evidence’ for synchronic noun–verb contrasts since matching nouns for # σ σ (σ) # verbs, or verbs matching # σ σ # nouns, did not appear in the verse citations in the OED and the Corpus of Middle English Prose and Verse.

(6) Prefixed loanwords in the pre-1400 poetic records:

Þa tgámes hë refúse nóldë
With Júpitèr compòuned só was shé

(King Alisaunder (396) c.1300)

Chaucer LGW (2585) c.1386

In ìncestë schôlë ȝe lỳbbe (?)
And in the rëscûs / óf this Pálamòn
Ând a cónduyt þàr-bi-sìde (?)
In rëward óf my dòughtër Shàmë
Of cóntræctës, ánd of làkkë of sàcràmentz

(Shoreham (Add 17376)68/1929 c.1350 (a.1333))

(Chaucer KnT 2643, also Tr I 478)

(S Engl Legendary (381/160) c.1300)

(Chaucer Rom 3254?a.1400)

(Chaucer FrT D.1308 c.1395)

Additional pairs can be posited for the post-1400 period, yet once again the rarity of such contrastive noun–verb attestations in the verse does not allow more than a tentative conclusion regarding the item’s ‘preferred’ prosodic contour in the poet’s or the scribe’s language.

(7) Noun–verb possible fifteenth-century Latin/Romance diatones:

He wëep, and hým excúseth pitóuslý
Bút for éxskus first of my rudnéssé (?)

(Chaucer MLT B.1059 c.1390)

(Lydgate FP (Hrl 1766)9.3366 ?a.1439)

Possible earlier examples would be (Jëte ñó shált wiþ Gódes míȝt) / Mo présánteë and jîftë him diȝt in Arthour & of Merlin (4172) (c.1330 [c.1300]), which allows scansion as a headless line with syncopë Mó presânteës… Also: In présànteë hëo hîn bróȝen, óLég.(LdMisc 108)178/22 (c.1300).

Also: Is cómfortë èn réfrèsshìng tò thàire kynìdë. On Hushbòndrìe 42:294. # σ σ (σ) # stress on the verb continues into the fifteenth century: Thus shé cómfortëd hyr amonçé (Ipomodyon 512 c.1440); also: Yow tò cómpòrt is hòly mỳn èntënte (Gener. (2) (Trin-C O.5.2) 76 a.1500, a.1450).

A headless scansion (I nýl ènvyë…) is unlikely because Chaucer’s headless lines are overwhelmingly syntactically enjambéed with the previous line, while this is an independent sentence.

All disyllabic attestations rescowe ‘to rescue’ in Chaucer (Tr III 857, Tr V 231) are in rhyme position.

Excuse, n., first recorded 1374. Headless lines constitute over 65 percent of the ‘irregular’ lines in The Fall of Princes (Myklebust 2012: 697).
And willfully rebelle & dissobeye
As blithe, his rebel gooost it mortifeþ;
O trine and óon, God Lorde, record I the
This sáide Xérxes, be récord óff auctórs (?) (Lydgate FP (Bod 263) 3.2234 ?a.1439)
And hárdi prówesse you tó conducte and leeđe
How gód hath máde this cónducte ánd convoye
That är subjécit tó tharę jóke
For cráfte ys siguęt vn-to kýnde

The attestations in (4)–(7) illustrate options available to the poets; they are selective and do not preclude final stress for the nouns, typically in rhyme position; see fn. 11. In addition to the items identified here, desert and incense have been identified as diatones for the period 1567–1700, but we have not found any testable attestations of a noun–verb contrast for them in verse before Levins (1570).22

This is a disappointingly short report on pre-1550 stress-shifts as found in verse. The demise of the ‘classical’ OE alliterative tradition with its robust link between stress and alliteration, and the transition to binary foot structure in ME isosyllabic verse, make the post-1150 verse materials much less informative about word prosody. The difficulty of tracking the metrical behavior of noun–verb pairs in the verse is compounded by the interference of paraphonological variants in the matching of the various metrical templates to the shape of lexical units whose prosodic contour is the target of discovery. The relative regularity of the metrical templates of some pre-1400 compositions, such as the septenarius of the Ormulum, or the tetrameters and pentameters of Chaucer and Gower, may allow more dependable, even quantifiable, parsing and testing of hypothetical prosodic contours of individual lexemes as in (6); see Duffell (2018), Duffell & Billy (2004). Yet the problems of final -e’s elision, optional inflectional syncope, stem-internal and compound-internal syncope, apocope in proclitics, [i, u] + [ə] contraction (synizesis), persist and appear to be much more

20 Scanned as Lydgate’s Type B: an extra w after the second beat, similarly the line illustrating record, n. in Lydgate FP (Bod 263) 3.2234. For the typology of Lydgate’s lines see Myklebust (2012: ch. 7).
21 This takes us into the sixteenth century: W. Lauder Compend. Tractate Dewtie of Kyngis sig. B4v. All pre-Levins citations of subject, v. in the OED are either in prose, or, if in verse, the verb rhymes. We have checked all attestations in the MED, Lydgate, Bokenham, On Husbondrie.
22 Genesis and Exodus a.1325 (c.1250) has 7 instances of désert n. ‘a barren area’ (975, 1248, 2770, 2852, 3308, 3734, 3883) versus 9 instances of désèrt (2737, 2867, 3296, 3352, 3562, 3646, 3744, 3845, 3879). Desert, v. ‘to abandon’ is first attested in 1539, but the first verse citation in the OED is Milton 1667, Paradise Lost 563: Of Wisdom; she désérts thee not. For incense we found: That fyry flambe ensènsed àlwaу out in Hawes, Pastime of Pleasure i. xv (1509), but no attestation of éncense, n. (# ǝ σ #) before: Offer pure incense to so pure a shrine (Shakespeare Lucrece sig. Clv,1594).
text- and author-variable in the fifteenth century. Two of the leading poets in the fifteenth-century illustrate the hazards of any automated data-collection: Hoccleve counted ten syllables per line meticulously (Jefferson 2000), but the iambic rhythm takes a back seat; and Lydgate adds idiosyncratic patterns such as pre-sonorant disyllabic long vowels in monosyllables, e.g., gold, child, fire, and schwa epenthesis in some [l] + [obstr.] coda clusters: -lk, -lf, thus follek for folk, selef for self. Both poets were fluent in Latin and French, a further complication.

Excluding attestations in rhyme, and discounting ME alliteration as evidence for prefixal stress, we have quadrupled the list of early diatonic pairs and have confirmed the likelihood of continuity of the OE subpattern. Nevertheless, the results still call for a quantifiable foundation for positing that the ME loanwords were undergoing change in line with the native diatonic model.

The sociocultural shift in the mode of versification in ME is accompanied by rapid accrual of Latin and OF/AN vocabulary. Quantifying the French and Latin contributions to ME, Durkin (2014: 256–7) finds that 48 percent of the MED headwords and 44 percent of the OED headwords first recorded in ME are from French or Latin. The sheer bulk of new items in which the original stress assignment rests on different principles eventually impacts the entire prosodic system and complicates further the issue of inherited asymmetry of verbal versus nominal prominence. Searching for more information on the interaction of native and borrowed vocabulary, we turned to lexicographical records that might be illuminating with regard to the continuity and/or significance of the pattern of prefixed diatones in OE as adumbrated in (2).

4 Revisiting the lexicographical records on functional stress-shifting

The strongly articulated dismissal of the possibility of functional stress-shifting in late ME in Nakao (1977: 152–61) emphasizes the discontinuity of the OE pattern of prefixal stress and yet posits a separate ‘rule’ for stress in prefixed items in late ME. It is precisely the prefixed items and their relation to stress-shifting that we want to explore further. This section addresses data that may help us evaluate existing proposals on the continuity and triggers of diatonic stress-shifting for the period up to Levins’ (1570) first contemporary records of stress.

4.1 Stress and prefixed productivity in Old English

As demonstrated in section 2, testable stress-shifting in OE occurs only within a subset of the prefixed items. Turning to the correlation between prefixal stress and prefixed productivity in the OE lexicon, it is clear that some prefixes combine much more

---

23 Kastovsky (1992: 361) states that stress alternations of prefixed items in OE was ‘the source’ of PDE record, v., récord, n. but his prefixation data (1992: 377–81) include only a few examples, no discussion. Minkova (2013: 310–12), Online Companion (2014: 9.6.1) addresses the fuzziness of the continuity of functional stress-shifting in OE and PDE.
readily with either nominal or verbal bases. A DOE search for the stress-shifting prefix æt- shows 74 verb headwords versus only 9 noun headwords. A search for in- shows 89 verbs and 47 nouns. We exclude prefixed verb derivatives in -end, -ing/-ung, -nes—they are not used in the poetry.24

The search for ‘exact’ numbers is often hampered by ambivalence on prefixal versus adverbial units, prompting an analytical equivalence between prefixed nouns and compounds (Kendall 1991: 176).25 With this preamble in mind, we collected the complete set of DOE entries for two prefixes, and- and ed-, which are always stressed, two stress-shifting prefixes, æt- and in-, and the consistently unstressed be- and for-. Table 1 presents the raw data on the correlation between prefixal stress and prefixal productivity.

It is only with and- and ed- that prefixed nouns (and adjectives) outnumber the verbal forms and they all preserve the prosodic contour of the input, e.g. éd-lēan ‘reward’ (c.300 tokens) versus éd-lēanian (8 tokens), also ge-éd-lēanian, ge-éd-lēanod, éd-lēaniend, ge-éd-lēaniend, éd-lēamung, ge-éd-lēamung. Both and- and ed- are lost very early in ME (OED, Molineaux 2012), leaving OE ánd-swaru, ánd-sawarian, ‘answer’, n., v. as the sole trace of that prefixal pattern.

For the variable and the unstressable prefixes, noun prefixation in OE is a more limited pattern compared to suffixation, both in terms of types and in terms of tokens, e.g. æt-hrīnan, v. ‘to touch’ (c.110 tokens), æt-hrine, n. ‘touch’ (17 tokens); belimpan, v. ‘pertain, occur’ (c.225 tokens) vs. belimp, n. ‘occurrence’ (11 tokens). In a lexical basis of 16,694 nouns, González Torres (2010: 23) reports that ‘suffixation outnumbers

| Prefix | Infinitive | Unsuffix. noun | -end | -ing/-ung | -nes |
|--------|-----------|---------------|------|-----------|------|
| and-   | 15        | 41            | 0    | 4         | 8    |
| ed-    | 18        | 29            | 5    | 11        | 1    |
| æt-    | 74        | 9             | 1    | 2         | 5    |
| in-    | 89        | 47            | 3    | 28        | 20   |
| be-    | 423       | 14            | 12   | 29        | 26   |
| for-   | 228       | 34            | 17   | 25        | 47   |

24 These are the only stress-shifting prefixes in DOE’s current version. The count for the nouns in in- excludes compounds of inwit-, innan-. Kendall (1991: 100) lists æ-, for-, geond-, of-, op-, to-, þurh-, wip- in verbs as always unstressed; these prefixes are not attested in nouns in Beowulf.
25 The DOE’s marking for prefixes versus adverbs and prepositions is ambivalent; hyphenation is used both after prefixes and after the first element of a compound. A search for be-, prefix, defines the entry as ‘The unstressed form of the prepositional adverb be, which forms a first element mainly in compound verbs.’ The entry lists 530 be- verbs in the database. The be- nouns are all verbal derivatives. The entry ed- ‘again’ has ed-wíþ ‘opprobrium’ hyphenated, but not edwitscipe ‘disgrace’. On attested particle–noun compounds, mostly non-monosyllabic, in ME, see Sauer (1992: 176–85).
prefixation at practically a ratio of 9 to 1 [(351 derived by prefixation and 3,137 by suffixation)]. This prompts us to set aside the suffixed noun forms in table 1. Focusing just on the noun–verb ratios for the other two types of prefixes, stress-shifting æt-, in-, and the unstressed be-, for-, the ratio graph in figure 1 illustrates the strong preference for prefixes to attach to verbal stems.

The clear preference for monosyllabic prefixes to combine with verb stems in the Germanic lexicon creates a competing model of stress assignment in which left-edge word-alignment is overridden by the presence of a (C)V(C)- prefix. The numerically most productive prefixes in table 1, be- and for-, plus over 2,000 ge- entries in the DOE, are thus entirely outside the stress template, irrespective of the grammatical nature of the stem. This, we believe, is a plausible lexicon-based starting point for assessing the role of prefixes in the historical trajectory of stress assignment.26

A reviewer points out that the case would be even more convincing if we were able to supply token frequencies. Unfortunately, token frequencies are not so readily available: the DOE as of Jan 2022 is currently only A to I. LAEME (2013) has token numbers but only covers selections until c.1325. LALME (2013) has only approximate estimates of token frequency. The impossibility of matching written-to-spoken frequency is obvious. Even in contemporary corpora of transcribed speech there are significant differences in the frequencies of very common words: Brysbaert et al. (2012) report such in a comparison of SUBTLEX-US, a corpus of mostly social interactions from film and television, and COCA, a corpus of TV and radio talk shows and written sources.

Figure 1. Noun–verb ratios for æt-, be-, for-, in-
4.2 Germanic versus Latin and OF/AN prefixes in Middle English

In ME the productivity of Germanic verbal prefixation continued along with the development and spread of phrasal verbs and the obsolescence of some OE prefixes (Lutz 1997; van Kemenade & Los 2003; Schröder 2008; Molineaux 2012; Thim 2012). Some monosyllabic prefixes (and-, æt-, ed-, forð-, on-, or-, oð-, þurh-, ymb-) lost their productivity during ME and some Germanic prefixes merged with their Romance homophones: mis-, in-. The reduced allomorph [ǝ]- of OE æ-, at-, on-, or-, and Lat. ad-, en-, ends up as ‘not a real prefix’ (Marchand 1969: 139), though new derivatives, all in predicative use (aflame, alee, aswoon), continue to be coined in ME.

The loss of predominantly heavy, stressable OE prefixes (Molineaux 2012) in ME increases the proportion of unstressable prefixes in the lexicon. The inseparable and always unstressed be- is very robustly productive. Petré (2006) records a steady rise in verbal be- prefixation up to 1350; a quick check of the timeline of the frequency of be-verbs in the OED shows a rising trajectory with both native and mixed etymology forms (begrudge, betray, bedoubt, beglue). After 1350, the numbers are doubled and even trebled, reaching a peak for 1600–50. The same OED search for verbs with for(e)- shows a peak in the 1350–1400 span for both native and mixed etymology verbs such as forchase, foreclose, forjoust. Such overlaps, as well as the density of new derivatives with unstressed Germanic prefixes, potentially enriches the input for noun–verb pairings both in the Germanic and in the new Latin and Romance vocabulary for the extended ME period.

A further rationale for a closer look at the lexicographical information for our period comes from the database of diatonic pairs in PDE. Hotta (2015: 16) expands the earlier list in Sherman (1975) from 150 to 235. Only 3 out of the 69 pre-1800 recorded pairs (torment, cement, bombard) are not prefixed items. Of the remaining more recently attested pairs, only 12 are not transparently prefixed. The role of prefixes in PDE diatonic stress assignment has been recognized (Hurrell 2001), and the ‘morphology hypothesis’ (Fournier 2007; Dabouis & Fournier 2017) has been tested and confirmed statistically, but pre-1550 data were not included in these studies.

4.3 OED data on prefixed nouns and verbs in ME

Turning to the attestations of prefixed nouns and verbs in the OED, we present in figure 2 a graph showing the first attestation dates that the OED cites for Latin/Romance nouns and verbs borrowed between 1200 and 1550. We chose the 1550 cut-off date, 20 years before the publication of Levins’ Manipulus vocabulorum (1570), assuming that he was recording prosodic patterns typical of his adult speech. We have filtered out compounds, suffixed and derived forms, as we are interested primarily in base forms;

27 The MED entry on in-, prefix reads: ‘The prefix in- loses its original sense … Perhaps because of its frequent occurrence in L & OF borrowings in which the original sense of the prefix had been forgotten (impugnacioun, incantacioun, etc.), in- is often a semantically empty addition to OE or ON roots (esp. verbs) used for translating foreign words in in-: … inknouen, inlouen, etc.’
we have also attempted to filter out monosyllables,\textsuperscript{28} as they do not give any evidence for stress.

A total of 8,295 words comprise this dataset. As we see, the number of non-Germanic nouns borrowed into ME vastly outnumbers that of verbs, 6,297 to 1998. We find that about 76 percent of all borrowings are nouns – and this trend is stable, with none of the half-century periods under consideration diverging notably from this proportion. The result is congruent with an earlier study sampling MED entries A–O first recorded 1100–1500, finding that ‘the bulk of lexical borrowing from the Romance languages (more than 2/3) consists of nouns’ (Dekeyser 1986: 261); the same study also records a drop in OF nominal borrowing from 87.5 percent of all Old French (OF) loans before 1200 to 61.25 percent in the latter half of the fifteenth century.

The picture is very different when we consider only prefixed items. Figure 3 displays a subset of the data presented in figure 2 where we have filtered out all words which, orthographically, must be unprefixed. A total of 2,173 words comprise this dataset, including 256 noun–verb pairs.\textsuperscript{29} Under these conditions, we find that prefixed nouns and verbs were borrowed into ME at much more similar rates. Though even within the prefixed population more nouns are borrowed than verbs (1,218 to 955), there are 50-year spans where the margin of error bars for nouns and verbs do overlap, unlike in figure 2.

\textsuperscript{28} A very basic attempt: we removed all entries with exactly one orthographic vowel.

\textsuperscript{29} A reviewer asked us to take this opportunity to see if there is a preferential order for pair borrowings: i.e. if nouns tend to be borrowed before or after their verb counterparts. We calculated the difference in years for when nouns were borrowed and when verbs were borrowed for our 256 pairs and found the differences were approximately normal, with a mean of 2 years toward verbs and a standard deviation of 101.6 years. We interpret this to mean there is no evidence of bias.
It is when we compare prefixed to unprefixed nouns and prefixed to unprefixed verbs that the picture becomes most clear. As shown in the bottom left panel of figure 4, prefixed nouns are a minority of borrowed nouns, 1,230 to 5,144 across the 350-year span, and the margin of error bars for the proportions in the upper left panel do not overlap. In contrast,
the bottom right panel shows that prefixed verbs are very close in number to unprefixed verbs, 957 to 1,045 for the same period, and that while the margin of error bars for the first 50-year span for verbs do not overlap, this is not so for any of the following spans, as the proportion of prefixed verbs continuously increases.

Considering the root-aligned stress pattern of ME, the righthand charts thus show that there has been consistent lexical pressure to model verbs as a sublexicon with noninitial stress. Yet, before moving onto the discussion, we wish to address the thought-provoking alternative possibility raised by a reviewer: prefixed verbs could have been more readily borrowed because they fit the established, right-strong stress pattern while prefixed nouns were blocked by strong left-strong stress. The best response we can give relies on what we know of borrowing patterns in contemporary languages. Though we are not experts in this field, we are unaware of research examining purely phonological factors that facilitate loanword adoption. That said, the idea that phonological factors may inhibit borrowing seems to us difficult to defend, as, impressionistically cross-linguistically, nearly every form of phonological process has been deployed to nativize borrowed, ungrammatical structures.30

5 Discussion

Our first remit in this article was to track and record evidence for the perseverance of the inherited OE subpattern of prefixed noun–verb stress-shifts in ME verse. Our expectations were partially validated in section 3; we more than quadrupled the known number of individual lexical items whose placement in ME verse bears out the hypothesis of continuity, yet due to the scarcity of data, the results fall short of statistical verifiability. The addition of lexicographical information (figure 4) reinforces the hypothesis of continuity by documenting that, whereas borrowed nouns came into ME with a preponderance of them unprefixed, prefixed verbs grew in proportion to unprefixed verbs quite early on. Taken together, these two angles on the evidence endorse a hypothesis that, in its earliest stages, functional stress-shifting was predicated on prefixation, in line with the ‘morphological hypothesis’ (Fournier 2007; Dabouis et al. 2014) formulated on the basis of later data. This inquiry into the early history of diatones suggests a significant lexical pressure to model verbs as a sublexicon with noninitial stress which affects the account of the overall evolution of the prosodic system of English.

30 If this were so, we might expect a language such as Japanese to borrow more words that conform to its strict phonotactics than otherwise expected, separate from prestige and topic-related factors. The ideal test case would be a language in contact with multiple languages with similar levels of prestige, similar perceived cultural strengths and starkly different phonotactic constraints. The finding of such a case is unfortunately beyond the scope of this article, though our interest has been piqued.
Examining stress patterns up to and including Chaucer, but not beyond, Minkova (1997) rejected earlier proposals that either the OF/AN, or the Latin stress rule had displaced the left-edge Germanic stress in pre-1400 English; similarly, Redford (2003), adding a hypothesis of ‘hovering’ stress for doublets in verse.\(^{31}\) McCully (2002) looks at post-1500 OED data, and McCully (2003: 355) talks of ‘the phonological crisis provided by the spectacle of incoming romance rules’, and provides arguments against what he labels ‘the catastrophe model’; his focus is on evaluating the empirical validity of competing descriptive models, but as far as source ME data go, it is still Chaucer/ Chaucerian versus later, or contemporary English, as in the most recent study of historical noun–verb stress contrasts (Hofmann 2020). Should one need further justification for our diachronic fact-finding mission, one particular recurrent statement about the chronology of prosodic change in English attempts a more explicit timeline for the stress innovations in PDE:

(8) Sequence of changes in stress parameters:

1400: Foot direction Leftward, Main stress Left (as in OE)
1530: Foot direction Rightward, Main stress Left
1660: Foot direction Rightward, Main stress Right

(Cited from Fikker, Dresher & Lahiri (2006: 146); also in Dresher & Lahiri (2005: 82–3), Dresher (2013: 61), Lahiri (2015: 231), Dresher & Lahiri (2015))\(^{32}\)

Obviously, any attempt to pin down cut-off dates has to draw arbitrary lines in a continuum, yet it is quite clear why the history of noun–verb contrasts and other pre-seventeenth-century developments call for a magnifying glass.\(^{33}\) Again, the consensus on the issue of MAIN STRESS LEFT / ALIGN-L (Root, PrWd) is that the exposure to the borrowed lexicon did not affect stress parameters before the sixteenth century. Recall also that in ME, most unprefixed disyllabic loanwords followed the GSR by default, except words borrowed directly from OF in which the ultima was not a light syllable (L), [-ǝ]; these items are readily assimilated to the GSR. All Latin disyllabic words obeyed the GSR, as did trisyllables with a light penult:

---

\(^{31}\) Redford (2003: 173) argues that ‘the weak-strong pattern is subject to a specific condition, namely it only occurs at the edge of a phrasal domain’, and he considers the possibility of hovering stress as in ten Brink (1881) and Nakao (1977).

\(^{32}\) Dresher & Lahiri (2015) skip the 1400-stage in the evolution of stress and amend their earlier timeline, leaving the OE model in force until around 1570. Drawing on Danielsson (1948), Poldauf (1981) and others, they associate the post-1560 change in the direction of parsing to the increased borrowing of Latinate suffixes such as -able/-ible, -ation, -ic(al), -ity, -ator, etc.

\(^{33}\) Compare Speyer (2009: 25) on German acquiring the Latin Stress Rule: ‘The shift towards the Latin stress occurred around the 17th century, to judge from the scarce data which is offered by the poetic scanning of the few native polysyllabic quasi-simplex words which exist in German.’
(9) Stress in disyllabic monomorphemic loans:

(a) Romance

\[ \sigma \text{H: } \sigma \sigma \text{tresor, real, colour, v., entrer, v.} \]

\[ \sigma \text{L: } \sigma \sigma \text{frere, dance, rouge, rime} \]

(b) Latin

\[ \text{H \sigma: } \sigma \sigma \text{gratis, herpes, index, factor} \]

\[ \text{L \sigma: } \sigma \sigma \text{crucus, onyx, legend} \]

With trisyllabic and longer non-Germanic words the patterns are more varied, but in that set, too, the potential of left-edge stress for underived words exists for \( \sigma L \sigma \) strings as in ábacus, Lúcifer, litany, símile. Alternating stress in borrowed derivatives: créature, pilgrimage, chivalrie is another prosodic contour compatible with OE suffixed words: bitellice ‘bitterly’, cristen-dômes ‘of Christianity’. These structural overlaps and the fact that English continued to be the first language of the majority of the population underlie the entrenchment of initial stress in the unprefix lexicon throughout ME.

Against this background, the new component in the timeline is the persistent violation of left-alignment for a considerable portion of the lexicon: the prefixed verbs irrespective of etymology, plus the overwhelming majority of paired prefixed nouns. While prefixes are accommodated by extrametricality/defooting for verbs, some prefixes lose their extrametricality in nouns in favor of satisfying Main Stress Left / Align-L (Root, PrWd). This was already the case in OE, providing a landing site for the expansion of the diatonic model in ME. On the other hand, the new non-Germanic prefixed lexicon strengthens prefixal defooting, creating ongoing competition between the two types of stress assignment. We submit, therefore, that the trajectory of stress-shifts in (8), which leaves the OE system intact into the middle of the sixteenth century, must be elaborated.

To recap, some factors that suggest a revised account of the ME ‘roots’ of functional stress-shifting are:

◊ Survival and considerable growth of OE unstressable prefixation (e.g. be-, for-, [ɔ-])
◊ Extrametricality of all borrowed monosyllabic prefixes in ME
Different noun–verb ratios for unprefixed and prefixed loanwords

Additional factors that influence the trajectory of diatonic stress-shifts are:

- Decreased transparency of borrowed monosyllabic prefixes, see fn. 5
- Persistence of left-alignment for nouns, both prefixed and unprefixed
- Increased exposure to stress-attracting suffixation

The combination of these factors presumably leads to the weakening of the essential principle of the GSR:

Demotion of ALIGN-L (Root, PrWd)

The ranking of these factors is a matter we cannot address yet, nor do we have the numbers or methodologies that might clear up the picture (Elkins 2020; Zuraw et al. 2021). Our findings nevertheless support a hypothesis that treats prefixes as the fifth column undermining the GSR from the earliest records on. The ‘future’ of diatonic pairs is foreshadowed by the prosodic asymmetry of prefixed nouns and verbs in OE. In ME, only a very small subset of OE prefixed nouns survives, while the verbal portion of the prefixed lexicon gains strength.34

All attempts to identify the factors for the rise and growth of diatones in English, a spectacularly unidirectional graph (Hotta 2015), take the middle of the sixteenth century as their starting point. We revisited the whole issue of how ME poets chose to position prefixed words and the status of these items in the ambient lexicon. The findings are thus relevant to the two central prosodic issues for ME: continuity of root-based primary stress, and continuity/evidence for variably stressed prefixed nouns and verbs. Going back to Sweet (1888: 887), Jespersen (1909: 174–82), Halle & Keyser (1971: 112–18), Kastovsky (1992: 361), we read that the OE model in (2) continued in Middle English.

(10) Halle & Keyser on dating the Middle English stress-shifts:

… the generalization of the Stress Retraction Rule did not at first extend to verb-noun pairs of the permit type … it is not until 1634 that we have reliable evidence of stress retraction in the nouns of this class. (1971: 112, n. 16)35

… in the earlier stage of the language, verb-noun stress doubllets did not occur in the Romance portion of the vocabulary but were restricted to the Germanic portion. (1971: 118)

Similarly, recall that Nakao’s study concludes that ‘There is little or no coherent correlation observable between prefixal stress and lexical categories’ (1977: 91).36 Our renewed, closer look at relevant pre-seventeenth-century data highlights previously

34 We agree with Fournier’s (2007: 226) statement on prefixed non-nouns: ‘If the prefixed part is an independent unit, its pronunciation is not changed. We contend that these historical prefixes are still part of the synchronic system of English.’

35 Their Stress Retraction Rule posited for OE and restricted to nouns (1971: 90), ‘retracts the stress from the last, or only, syllable of the stem to the first syllable of the word’. Suffixation does not affect the rule’s operation.

36 Nakao (1984: 99) acknowledges that prefixes ‘merit consideration’ in the evolution of stress, but only as secondary to suffixes, and without further discussion.
ignored morphological and lexical factors in play throughout the history of the language. This leads us to suggest that the diatonic pattern was never interrupted, though the metrical evidential basis for the assumption was found to be slim, slight and slender. That part of the data remains disappointingly unobtainable.

Nevertheless, the newly documented high rates of verbal prefixation in the lexicons of OE and ME reveal a fresh angle on the role of prefixed verbs: they have been destabilizing ALIGN-L (Root, PrWd) from OE on. At the same time, while newly borrowed, prefixed nouns did enter the ME lexicon, the majority of borrowed nouns were not prefixed and so immediately or near-immediately conformed to the native stress pattern.

This is in partial agreement with Kiparsky (2016: 467) who comments on the various approaches to the growth of diatones, stating: ‘This is obviously not sound change but the analogical spread of a morphological stress rule within the lexicon.’ Is there a phonological component? Kelly (1988: 213) noted the relevance of stem codas for stress contrasts in noun–verb homographs in PDE, and Minkova (1997) treats ME nouns and verbs separately on account of the lag-time in inflectional loss in verbs, compared to nouns, an observation bolstered by subsequent digging into the prevalence of alveolar codas in verb loans exhibiting the shift (see also Sonderegger 2010/2016: 415; Hotta 2015). It is possible that phonological factors were involved in the non-survival of earlier diatonic pairs as in envy, exile, council cited in (5). Thus, we are not ready to reject the ‘sound change’ aspect of the early development until we have more data on the phonological details of the material in figures 2–4.

6 Implications and prospects

Recent research that looks into ME verse evidence for the noun–verb prosodic asymmetry (Hofmann 2020) seeks to establish the effect of rhythmic context for the attested patterns as found in Chaucer. Hofmann’s tentative conclusion is that rhythmic context is an additional factor in the behavior of verbs and nouns. However, he does note (2020: 480) that other conditioning factors, including derivational morphology, have not been addressed, singling out the prosodic status of prefixes as one of those possible or probable aspects of the reconstruction that has not been dealt with. We concur, and this article endeavors to address prefixation and its interaction with prosody, meter and the structure of the lexicon.

Our findings here are not as complete as we would like. Consider Molineaux’s (2012) argument that the heavy, stressable, monosyllabic prefixes of OE were lost in the transition to ME, motivated by stress-clash avoidance. The extent to which this avoidance is a factor in the accommodation and later history of borrowed prefixes is unclear. The

37 Molineaux (2012) argues for a prosodic component in the account of the loss of native prefixation in ME verbs: ‘In this new situation, words with heavy monosyllabic prefixes displayed an undesirable succession of stressed syllables at the prefix–root boundary, which ultimately brought about prefix loss and lexicalisation.’ Prefixal weight is isolated as a phonological factor in Nakao (1977: 182), who states: ‘We have seen that LME word
The majority of prefixed borrowed words (1200–1550) have heavy prefixes, with already reduced OF/AN de-, pre-, pro-, re- as our only exceptions. However, words with these light prefixes comprise a large portion of our data, which would align them with the robustly productive and unstressable a-, be-, for- in the native input. Moreover, the issue of prefix weight is not fully addressable without considering the weight of the first post-prefixal syllable and the composition of its onset. This involves future work on the creation of a database that includes the OED’s IPA transcriptions; see Smith (2016).

The roots and causes of the spread of stress-shifting in sixteenth–twenty-first-century vocabulary remain a troubled topic. Although the focus of this study is on continuous or newly emerging functional prosodic contrasts as in présent, n., adj. – présént, v., both the methodology and the results bear directly on mapping the overall evolution of stress patterns in earlier English. The correlation between morphological structure and diatonic shifts in homographic pairs is addressed here only on the level of word stress. The extent to which the assumed presence of diatones in OE and ME correlates with the general prosody of the language with respect to higher-level prominence for different word classes is not a straightforward matter either. In OE, variable verb-placement in different types of clauses (VS, VO, SV, OV) may interact with right prominent phrasal stress, and the type of verb (auxiliary, pre-modal, or full) also affects its prosodic prominence. Thus, despite the long tradition of citing prefixed category-specific shifts in OE (Campbell 1959; Hogg 1992; Lass 1994) for the variably stressed prefixes, further discussion of the prefixation condition for # σσ- in nouns and adjectives versus # σ- in finite verbs has to take into account the well-documented differential behavior of unprefixed verbs and nouns/adjectives as in gripe ‘grip, sword’ vs. grīpeð ‘grasps’ or cearu ‘care, sorrow’ vs. cearað ‘cares, is anxious’:

(11) Variably stressed noun–verb unprefixed pairs in OE verse:

| Word  | Line | Source |
|-------|------|--------|
| oððe gripe mēces, / oððe gāres flīht, | (Beo 1765) |
| mōdwlonc mcowle, / þet heo on mcc grīpeð | (Riddle 25.7) |
| cūþe folme; / cearu wēs genīwod | (Beo 1303) |
| longsumne lōf; / nā ymb his Ilf cearað | (Beo 1536) |

The pattern of non-alliteration of unprefixed verbs illustrated in (11) is not categorical; in Beowulf, 23.6 percent of the finite verbs alliterate (Getty 2002: 62). Finete verbs are treated differently verse-initially and verse-finally, and the main alliterative templates

stress is by and large predictable from underlying segmental composition of words, without being sensitive to the distinction of the categories that they belong to.’

Russom (2022) discusses the relationship between early OE V-final syntax, which favors finite verbs line-finally in the meter of Beowulf. In that position finite verbs other than be and auxiliaries are metrically prominent, but less prominent than earlier in the line. Also, the semantic nature of the verb and its frequency have an effect on the prominence of the finite verb (see also Getty 2002; Los et al. 2012; Griffith 2016). Getty (2000) expresses a very skeptical view of the verse-based assumption of ‘weaker’ prominence for lexical finite verbs in OE: ‘one is left having to say that finite verbs are stressless except when they aren’t’ (2000: 47); ‘the idea that the stress properties of finite verbs, especially robustly lexical verbs … can be swept aside is suspect, if not altogether baffling’ (2000: 48). How this can be tested in ME – maybe with monosyllabic pairs – is a separate issue which deserves to be recorded under ‘future directions’.
(a b : a x, or a a : a x) preclude correspondence between alliteration and metrical prominence at the end of the b-verse. Again, the verbs’ variable behavior in verse depends on their position in the clause; initial, medial, final; on the nature of adjacent lexical items in the verse; and not least, on the ‘poetic register’, a topic of much attention and disagreement; see Bliss (1967), Russom (1987: 33–8, 2022), Kendall (1991: 26–36), Los (2015: 226–9), Griffith (2016), Donoghue (2018: 143–51) and references there. For PDE, Kelly & Bock (1988) turn to metrical evidence to corroborate their experimental findings. They report that the alignment of words with strong beats depends on grammatical class: monosyllabic nouns fill strong metrical positions 94 percent of the time in samples of Milton’s and Shakespeare’s verse, while verbs fill such positions only 76 percent of the time.

How these questions play out in ME is still unclear; they warrant a separate treatment. In this connection we note that experimental research on the prosodic asymmetry in PDE (Kelly & Bock 1988; Guion et al. 2003, confirmed in Smith 2016) finds that disyllabic nouns are significantly more often trochaic, while disyllabic verbs are iambic.

Finally, the role of lexical frequency in the earlier history of functional stress-shifting also remains murky. Phillips (2006: 121) found that ‘low entrenchment’ of the new, low-frequency homographic words allowed nouns to get initial stress – they were treated as ‘new’ words. Hotta (2015) finds the frequency effect ‘difficult to evaluate’, and Sonderegger (2010/2016) makes a convincing case for combining the frequency factor with the structural factor of prefixation in the account of the smaller diatonic database in Sherman (1975). How these positions jibe with the high productivity and token density of items with inherited unstressable prefixes (be-, for-, a-) has not yet been elucidated. Further, current research suggests that separate lexical entries are maintained for not only phonologically identical content words (Gahl 2008) and inflectional morphemes (Plag et al. 2017), but also homophonous, homographic, zero-derived noun–verb pairs (Lohmann 2018, 2020a, 2020b). Though we will likely never know if the durational correlations discussed in these articles can be projected back to OE and ME, it is clear that lexical frequency should not be ruled out as a factor without cause.

Authors’ addresses:

Department of English
University of California, Los Angeles
Renée & David Kaplan Hall
Los Angeles, CA 90095–1530
USA
minkova@humnet.ucla.edu

Department of Linguistics
University of California, Los Angeles
3125 Campbell Hall
Los Angeles, CA 90095-1543
References

Berg, Thomas. 1999. Stress variation in British and American English. *World Englishes* 18(2), 123–43.

Berg, Thomas. 2000. The position of adjectives on the noun–verb continuum. *English Language and Linguistics* 4, 269–93.

Bliss, Alastair J. 1967. *The metre of ‘Beowulf’*. Revised edn. Oxford: Blackwell.

Brysbaert, Marc, Boris New & Emmanuel Keuleers. 2012. Adding part-of-speech information to the SUBTLEX-US word frequencies. *Behavior Research Methods* 44(4), 991–7.

Burzio, Luigi. 1994. *Principles of English stress*. Cambridge: Cambridge University Press.

Campbell, Alistair. 1959. *Old English grammar*. Oxford: Clarendon Press.

Dabouis Quentin, Jean-Michel Fournier & Marjolaine Martin. 2014. Testing parameters for stress placement: The case of dissyllabic prefixed verb/noun pairs. Paper presented at the Old World Conference in Phonology, January 2014, Leiden. [https://hal.archives-ouvertes.fr/hal-01346865/document](https://hal.archives-ouvertes.fr/hal-01346865/document)

Dabouis, Quentin & Jean-Michel Fournier. 2017. The stress pattern of English verbs. Paper presented at the Thirteenth PAC (Phonologie de l’Anglais Contemporain) Conference, Université Paris Nanterre, 28–30 September 2017.

Danielsson, Bror Axel. 1948. *Studies on the accentuation of polysyllabic Latin, Greek, and Romance loan-words in English, etc*. Stockholm: Almqvist & Wiksell.

Dekeyser, Xavier. 1986. Romance loans in Middle English: A reassessment. In D. Kastovsky & A. Szwedek (eds.), *Linguistics across historical and geographical boundaries*, 253–65. Berlin: Mouton de Gruyter.

Dobson, Eric. 1957. *English pronunciation 1500-1700*. Oxford: Oxford University Press.

DOE: The Dictionary of Old English: A to I online. 2018. [https://tapor.library.utoronto.ca/doi/](https://tapor.library.utoronto.ca/doi/)

Donoghue, Daniel. 2018. *How the Anglo-Saxons read their poems*. Philadelphia: University of Pennsylvania Press.

Drescher, Elan. 2013. The influence of loanwords on Norwegian and English stress. *Nordlyd* 40(1), 55–65.

Drescher, Elan & Aditi Lahiri. 2005. Main stress left in Early Middle English. In Michael Fortescue, Eva Skafte Jensen, Jens Erik Mogensen & Lene Schøsler (eds.), *Historical Linguistics 2003. Selected papers from the 16th International Conference on Historical Linguistics, Copenhagen 11–15 August 2003*, 75–85. Amsterdam: John Benjamins.

Drescher, Elan & Aditi Lahiri. 2015. Romance loanwords and stress-shift in English: A quantitative approach. Talk presented at the Second Edinburgh Symposium on Historical Phonology, University of Edinburgh, 3–4 December 2015.

Duffell, Martin. 2018. *Chaucer’s verse art in its European context*. Tempe, AZ: Arizona Center for Medieval & Renaissance Studies.

Duffell Martin J. & Dominique Billy. 2004. From decasyllable to pentameter: Gower’s contribution to English metrics. *The Chaucer Review* 38(4), 383–400.

Durkin, Philip. 2014. *Borrowed words: A history of loanwords in English*. Oxford: Oxford University Press.

Elkins, Noah Eli. 2020. Prefix independence: Typology and theory. PhD dissertation, University of California, Los Angeles. ProQuest Dissertations Publishing 28152198.

Fikkert, Paula. 2003. The prosodic structure of prefixed words in the history of West Germanic. In Paula Fikkert & Haise Jacobs (eds.), *Development in prosodic systems*, 315-48. Berlin: Mouton de Gruyter.
Fikkert, Paula, B., Elan Dresher & Aditi Lahiri. 2006. Prosodic preferences: From Old English to Early Modern English. In Ans van Kemenade & Bettelou Los (eds.), The handbook of the history of English, 125-50. Oxford: Blackwell.

Fournier, Jean-Michel. 2007. From a Latin syllable-driven stress system to a Romance versus Germanic morphology-driven dynamics: In honour of Lionel Guierre. Language Sciences 29, 218–36.

Gahl, Susanne. 2008. Time and thyme are not homophones: The effect of lemma frequency on word durations in spontaneous speech. Language 84(3), 474–96.

Getty, Michael. 2000. Differences in the metrical behavior of Old English finite verbs: Evidence for grammaticalization. English Language and Linguistics 4(1), 37–67.

Getty, Michael 2002. The metre of Beowulf: A constraint-based approach. Berlin: Mouton de Gruyter.

González Torres, Elisa. 2010. The bases of derivation of Old English affixed nouns: Status and category. Studia Anglica Posnaniensia 46(2), 21–33.

Griffith, Mark. 2016. Alliterating finite verbs and the origin of rank in Old English poetry. In Leonard Neidorf, Rafael Pascual & Tom Shippey (eds.), Old English philology: Studies in honour of R. D. Fulk, 103–21. Cambridge: D. S. Brewer.

Guion, Susan G., J. J. Clark, Tetsuo Harada & Ratree P. Wayland. 2003. Factors affecting stress placement for English nonwords include syllabic structure, lexical class, and stress patterns of phonologically similar words. Language and Speech 46, 403–26.

Halle, Morris & Samuel J. Keyser 1971. English stress: Its form, its growth, and its role in verse. New York: Harper and Row.

Hofmann, Klaus. 2020. Stress in real time: The noun–verb stress contrast and the rhythmic context hypothesis in the history of English. Journal of Historical Linguistics 10(3), 452–86.

Hogg, Richard. 1992a. A grammar of Old English, vol. I: Phonology. Oxford: Blackwell.

Hogg, Richard. 1992b. Phonology and morphology. In Hogg (ed.), 67–168.

Hogg, Richard (ed.). 1992c. The Cambridge history of the English language, vol. I: The beginnings to 1066, 67–168. Cambridge: Cambridge University Press.

Hotta, Ryuichi. 2015. A phonological motivation behind the diatonic stress-shift in Modern English. In Dag T. T. Haug (ed.), Historical linguistics: Selected papers from the 21st International Conference on Historical Linguistics, 3–18. Amsterdam: John Benjamins.

Hurrell, Esther. 2001. The morphology and phonology of English noun–verb stress doublets. PhD dissertation, Edinburgh University.

Jefferson, Judith A. 2000. The Hoccleve holographs and Hoccleve’s metrical practice: More than counting syllables? Parergon 18(1), 203–26.

Jespersen, Otto. 1909. A modern English grammar on historical principles. Part I: Sounds and spellings. Heidelberg: Carl Winter.

Kastovsky, Dieter. 1992. Semantics and vocabulary. In Hogg (ed.), 290–408.

Kelly, Michael H. 1988. Rhythmic alternation. Cognition 30, 107–37.

Kelly, Michael H. & J. Kathryn Bock. 1988. Stress in time. Journal of Experimental Psychology 14(3), 389–403.

Kemenade, Ans van & Bettelou Los. 2003. Particles and prefixes in Dutch and English. In Yearbook of Morphology 2003, 79–117. Dordrecht: Springer.

Kendall, Calvin B. 1991. The metrical grammar of ‘Beowulf’. Cambridge: Cambridge University Press.

Kiparsky, Paul. 1977. The rhythmic structure of English verse. Linguistic Inquiry 8(2), 189–247.

Kiparsky, Paul. 2016. Labov, sound change, and phonological theory. Journal of Sociolinguistics 20(4), 464–88.
Lahiri, Aditi. 2015. Change in word prosody: Stress and quantity. In Patrick Honeybone & Joseph Salmons (eds.), The handbook of historical phonology, 219–44. Oxford: Oxford University Press.

Lass, Roger 1992. Phonology and morphology. In Norman Blake (ed.), The Cambridge history of the English language, vol. II: 1066–1476, 23–154. Cambridge: Cambridge University Press.

Lass, Roger 1994. Old English: A historical linguistic companion. Cambridge: Cambridge University Press.

Lass, Roger (ed.), 1999. Cambridge history of the English language, vol. III: 1476–1776. Cambridge: Cambridge University Press.

LAEME. 2013. A Linguistic Atlas of Early Middle English, 1150–1325, version 3.2, compiled by Margaret Laing. www.lel.ed.ac.uk/ihd/laeme2/laeme2.html

Levins, Peter. 1570. Manipulus vocabulorum: A rhyming dictionary of the English language. Reissued 1867 (EETS o.s. 27). London: Trübner in Komm.

Lohmann, Arne. 2018. Cut (n) and cut (v) are not homophones: Lemma frequency affects the duration of noun–verb conversion pairs. Journal of Linguistics, 54(4), 753–77.

Lohmann, Arne. 2020a. Nouns and verbs in the speech signal: Are there phonetic correlates of grammatical category? Linguistics 58(6), 1877–911.

Lohmann, Arne. 2020b. No acoustic correlates of grammatical class – Failure to replicate Sereno & Jongman (1995). Phonetica. https://doi.org/10.1159/000506138

Los, Bettelou. 2015. Historical syntax of English. Edinburgh: Edinburgh University Press.

Marchand, Hans. 1969. The categories and types of present-day English word-formation, 2nd edn. Munich: C. H. Beck.

Mccully, Christopher B. 2002. Exaptation and English stress. Language Sciences 24(3/4), 323–44.

Mccully, Christopher B. 2003. Left-hand word-stress in the history of English. In Paula Fikkert & Haike Jacobs (eds.), Development in prosodic systems, 349–94 Berlin: De Gruyter Mouton.

Minkova, Donka. 1997. Constraint ranking in Middle English stress-shifting. English Language and Linguistics 1(1), 135–75.

Minkova, Donka. 2008. Prefixation and stress in Old English. Word Structure 1, 21–52.

Minkova, Donka. 2009. Diagnostics of metricality in Middle English alliterative verse. In Judith Jefferson & Ad Putter (eds.), Approaches to the metres of alliterative verse, 77–113. Leeds: Leeds Texts and Monographs.

Minkova, Donka. 2013. A historical phonology of English. Online Companion (2014) at https://edinburghuniversitypress.com/pub/media/resources/Historical_Phonology_of_English_-_Online_Companion.pdf. Edinburgh University Press.

Molineaux, Benjamin. J. 2012. Prosodically conditioned morphological change: Preservation vs loss in Early English prefixes. English Language and Linguistics 16(3), 427–58.

Myklebust, Nicholas. 2012. Misreading English meter: 1400–1514. PhD dissertation, University of Texas, Austin.

Nakao, Toshio. 1977. The prosodic phonology of late Middle English. Tokyo: Shinozaki Shorin.

Nakao, Toshio. 1984. On late Middle English word stress. In N. F. Blake & Charles Jones (eds.), English historical linguistics: Studies in development, 87–100. Sheffield: University of Sheffield.

Petré, Peter. 2006. The prefix be-/bi- as a marker of verbs of deception in late Old and early Middle English. BELL: Belgian Journal of English Language and Literatures 4, 109–27.
Phillips, Betty S. 1998. Word frequency and lexical diffusion in English stress-shifts. In Richard Hogg & Linda van Bergen (eds.), *Germanic linguistics*, 223–32. Amsterdam: John Benjamins.

Phillips, Betty. 2006. *Word frequency and lexical diffusion*. New York: Palgrave.

Plag, Ingo, Julia Homann & Gero Kunter. 2017. Homophony and morphology: The acoustics of word-final S in English. *Journal of Linguistics* 53(1), 181–216.

Poldauf, Ivan. 1981. The genesis of terminational stress in English. *Lingua* 54(4), 335–59.

Redford, Michael. 2003. English stress doubles: New evidence from Chaucer’s meter. In Paula Fikkert & Haïke Jacobs (eds.), *Development in prosodic systems* (Studies in Generative Grammar 58), 159–96. Berlin: Mouton de Gruyter.

Russom, Geoffrey. 1987. *Old English meter and linguistic theory*. Cambridge: Cambridge University Press.

Russom, Geoffrey. 2022. Metrical evidence for the evolution of English syntax. *English Language and Linguistics* 26(3), 583–601.

Sauer, Hans. 1992. *Nominalkomposita im Frühmittelenglischen*. Tübingen: Max Niemeyer Verlag.

Schlüter, Julia. 2005. *Rhythmic grammar: The influence of rhythm on grammatical variation and change in English*. Berlin: Walter de Gruyter.

Schmid, Helmut. 2019. Deep learning-based morphological taggers and lemmatizers for annotating historical texts. *DATECH: Proceedings of the 3rd International Conference on Digital Access to Textual Cultural Heritage. May 2019, Brussels, Belgium*, 133–7. New York: Association for Computing Machinery.

Schröder, Anne. 2008. Investigating the morphological productivity of verbal prefixation in the history of English. *AAA: Arbeiten aus Anglistik und Amerikanistik*, 47–69.

Selkirk, Elisabeth O. 1980. The role of prosodic categories in English word stress. *Linguistic Inquiry* 11(3), 563–605.

Sherman, Donald. 1975. Noun–verb stress alternation: An example of the lexical diffusion of sound change in English. *Linguistics* 13(159), 43–72.

Smith, Jennifer L. 2016. Segmental noun/verb phonotactic differences are productive too. In Patrick Farrell (ed.), *Proceedings of the Linguistic Society of America*, vol. 1, art. 3717. Washington, DC: LSA. [http://journals.linguisticsociety.org/proceedings/index.php/PLSA/article/view/3717](http://journals.linguisticsociety.org/proceedings/index.php/PLSA/article/view/3717)

Sonderegger, Morgan. 2010/2016. Testing for frequency and structural effects in an English stress-shift. *Proceedings of the 36th Annual Meeting of the Berkeley Linguistics Society*, 411–25.

Sonderegger, Morgan & Partha Niyogi. 2013. Variation and change in English noun/verb pair stress: Data, dynamical systems models, and their interaction. In Alan C. L. Yu (ed.), *Origins of sound patterns: Approaches to phonologization*, 262–84. Oxford: Oxford University Press.

Speyer, Augustin. 2009. On the change of word stress in the history of German. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 131(3), 413–41.

Sweet, Henry. 1888. *A history of English sounds from the earliest period: With full word-lists*. Oxford: Clarendon Press.

Ten Brink, Bernhardt. 1881. *Chaucers Sprache und Verskunst*. Leipzig: T. O. Weigel.

Thim, Stefan. 2012. *Phrasal verbs: The English verb-particle construction and its history* (Topics in English linguistics 78). Berlin: Walter de Gruyter.

Zuraw, Kie, Isabelle Lin, Meng Yang & Sharon Peperkamp. 2021. Competition between whole-word and decomposed representations of English prefixed words. *Morphology* 31, 201–37.