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Productivity and graduality in the Layered Structure of the Word. Opaque word-formation in Old English.

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Opaque word-formation in Old English

Abstract

This article deals with two theoretical aspects of lexical derivation, productivity and graduality. After a discussion of transparency and opaqueness in Old English word-formation, it focuses on lexical productivity and puts forward a typology of recursive phenomena. On the basis of this typology, the morphological template of the Layered Structure of the Word is revised. The main conclusion is that a more diachronically oriented analysis is likely to opt for a decompositional template, whereas a more synchronically directed study which seeks typological validity will probably favour the template with one functional slot. If the focus is on diachronic linguistics, a template based on minimal constituent analysis can guarantee a detailed description of the derivational steps of the word, including non-affixal derivation and semantically opaque affixes.

Keywords: derivational morphology, Old English, Layered Structure of the Word, recursivity productivity, graduality.

Resumen

Este artículo trata dos aspectos teóricos de la derivación léxica, la productividad y la gradualidad. Tras una discusión sobre la transparencia y la opacidad en la formación de palabras en inglés antiguo, el trabajo se centra en la productividad léxica y propone una tipología del fenómeno de la recursividad. De acuerdo con dicha tipología, se modifica la plantilla morfológica de la estructura jerárquica de la palabra (*Layered structure of the word*). La conclusión principal es que un análisis en el eje diacrónico optará por un modelo de descomposición gradual, mientras que un estudio sincrónico que se proponga lograr la validez

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tipológica recurrirá al modelo de plantilla morfológica con una única posición funcional. En el análisis diacrónico, la plantilla de constituyentes mínimos garantiza la descripción detallada de los procesos derivativos de la palabra, incluidos la derivación no afijal y los afijos opacos desde el punto de vista semántico.

Palabras clave: morfología derivativa, inglés antiguo, estructura jerárquica de la palabra, recursividad, productividad.

1. Introduction

This article deals with two theoretical aspects of lexical derivation: productivity, and graduality. These topics, relevant for word-formation in general, are central to recursive, and opaque formations because they raise issues related to the limits of analyzable derivations, including the relationship between the analyzable, and the unanalyzable parts of some formations. The language of analysis is Old English because it combines relatively transparent derivations, characteristic of word-formation, with *Ablaut* relations, and derivational mismatches more compatible with a language with stem formation.

This research also intends to contribute to the development of the morphology of Role and Reference Grammar (hereafter RRG, Robert Van Valin and Randy LaPolla 1997; Van Valin 2005). So far, the advances in the morphology of this theoretical model have been made in two directions mainly. Francisco Cortés Rodríguez (2006) as well as Cortés Rodríguez and Eulalia Sosa Acevedo (2008) have put forward a general framework of word-formation in the theory with special emphasis on the semantic side of derivational morphology, and Javier Martín Arista (2008; 2009; 2011a) has focused on the generalization of the syntagmatic procedure of the clause to the complex word, called the *Layered Structure of the Word*. The Layered Structure of the Word, which has been applied to non-recursive transparent formations, needs a revision in order to accommodate more complex phenomena like the ones

1 that arise in the lexical derivation of a language such as Old English, which is in the transition
2 from variable base morphology to invariable base morphology (Dieter Kastovsky 1992).
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4 The question of recursivity in word-formation has not been addressed yet in the RRG
5 framework, and has drawn little or no attention in the wider context of the discipline.
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7 Recursivity in syntax, on the other hand, has been at the core of linguistic debate recently. In
8 general, Generative Linguistics has insisted on the aspects of this phenomenon relating to the
9 knowledge of language, and its productive potential (thus, for instance, the volume edited by
10 van der Hulst in 2010). The RRG approach, on its part, has focused on the embedding
11 capacity of certain constructions, as in the discussion of relativization in English, and Basque
12 by Emma Pavey (2010: 312). For this author, recursion in syntax is the “embedding of clauses
13 inside clauses”, as in a relative clause inside another relative clause within a noun phrase.
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25 For these reasons, this article addresses the question of recursivity in word-formation,
26 and takes issue with some theoretical aspects such as productivity, and the graduality of
27 derivations. It is organized as follows. Section 2 is devoted to transparency, and opaqueness.
28 It stresses the transparency of Old English word-formation, and the suitability of this
29 historical language for a study in the derivation of derivatives, but also focuses on some
30 opaque areas of word-formation. In section 3, which deals with lexical productivity from a
31 qualitative point of view, a typology of recursive phenomena in Old English is proposed that
32 draws a number of basic distinctions based on the dynamic nature of word-formation as well
33 as the interaction of derivational processes, and the units that partake in them. In section 4, a
34 revised version of the morphological template of Old English is proposed that is based on the
35 typology of recursive phenomena. The main conclusions are summarized in section 5.¹
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56 ¹ We would like to thank Javier Martín Arista for his comments and remarks on earlier versions
57 of this paper. Disclaimers apply.
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2. Transparency vs. opaqueness in the derivations of Old English

One of the most remarkable characteristics of the lexicon of Old English is its Germanic character, which is directly related to its associative nature. Indeed, the use of native sources to feed word-formation processes gives rise to a derived lexicon that consists, with few exceptions, of native elements; while the lack of a wide choice of foreign elements reinforces derivational processes based on native elements. These aspects have been discussed by Kastovsky (1992), who describes these characteristics, and stresses the existence of large morphologically related word-families in Old English, like the one of the strong verb *gan* ‘to go’ (*gang* ‘going, journey, track’, *angenga* ‘a solitary, lone goer’, *agan* ‘to go, go by’, *began* ‘to go over’, *forgan* ‘to pass over, abstain from’, among others). Kastovsky (1992: 294) considers the morphological relationships that hold in the word-families of Old English *transparent not only formally but most often also semantically*.²

Some recent works explore the limits of the formal, and semantic transparency of Old English. While concurring on the general assessment made by Kastovsky (1992) with respect to transparency, these works find areas of opaqueness, both on the semantic, and the morphological sides of lexical derivation.

² The data for this research comprise around 33,000 lexical entries (in type analysis) retrieved from the lexical database of Old English *Nerthus*, which is based on the dictionaries by Bosworth-Toller, Hall and Sweet. The evidence gathered for this section comprises 346 recursive suffixed nouns (out of a total of 3,658 suffixed nouns), 160 recursive suffixed adjectives (out of 2,299 suffixed adjectives) and 127 recursive strong verbs (the total of prefixed strong verbs being 1,025).

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With respect to semantic transparency, and opaqueness, Martín Arista and Raquel Veá Escarza (2016) raise the question of how transparent the affixation of nouns and adjectives in Old English is. These authors put forward three principles of semantic transparency. The first stipulates that the attachment of an affix modifies the meaning of the base of derivation in a significant way. The second principle requires that an affix perform the same lexical function in all the derivatives where it is attached. The third principle of semantic transparency establishes that a lexical function is performed by the same affix in all the derivatives where it is found. Martín Arista, and Veá Escarza (2016) hold that the relation affix-function is more transparent than the relation function-affix. For instance, in the formation of nouns the maximal degree of transparency is found in affixes that are going through naturalization after being borrowed (*ante-*, *arce-*, *sub-*) or lexical items that are undergoing grammaticalization (*eall-*, *full-*, *twi-*, *wið-*, and *-bora*); while in the formation of adjectives the maximal transparency corresponds to prefixes with a prepositional counterpart (*æfter-*, *tō-*, *wiðer-*), and suffixoids (*-cund*, *-feald*, *-leas*, and *-sum*). On the basis of these principles, Martín Arista and Veá Escarza (2016) reach the conclusion that the affixation of Old English nouns and adjectives is relatively transparent.

As regards formal transparency and opaqueness, three areas have drawn attention, to wit, alternations, the formation with some specific affixes, and mismatches in derivation.

With respect to alternations, Kastovsky (1968) presented the first systematic account of the vocalic alternations found in the formation of Old English nouns from strong verbs, although the question had been tackled before, thus Carl Palmgren (1904), Claus Schuldt (1905), and John Jensen (1913), among others. Kastovsky (1968) described the alternations involving the stems of the present, preterit and past participle of strong verbs, on the one hand, and those of the nouns that are morphologically related to the strong verb, on the other. For instance, between the strong verb *drīfan* (infinitive) ‘to drive’ - *drāf* (first preterit) - *drifon*

1 (second preterit) - *drifēn* (past participle) and the noun *dræf* ‘a drive’ an alternation holds with
2 respect to the first preterit that can be represented by means of the graphemes <ā> ~ <æ>.
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4 Martín Arista (2017) engages in the vocalic alternations that hold between zero derived
5 nouns, adjectives, and weak verbs, and their bases of derivation, and insists on the need for a
6 more systematic model of alternations. Zero derivation in this work is derivation without the
7 attachment of derivational morphemes. Four subtypes can be distinguished on the grounds of
8 this definition (Martín Arista 2017: 152): zero derivation with inflectional morphemes, and
9 without derivational morphemes, as in *rīdan* ‘to ride’ > *ridda* ‘rider’; zero derivation without
10 explicit inflectional or derivational morphemes, as in *bīdan* ‘to delay’ > *bīd* ‘delay’; zero
11 derivation with Ablaut, such as *cnāwan* ‘to know’ > *cnēowian* ‘to know carnally’; and zero
12 derivation with formatives, such as *-m* in *flēon* ‘to fly’ > *flēam* ‘flight’. This author
13 distinguishes direct from reverse alternations depending on whether or not they conform to
14 the general evolution of i-mutation. For instance, *steppan* ‘to step’ ~ *stepe* ‘step’ is a direct
15 alternation whereas *hebban* ‘to heave’ ~ *hæf* ‘leaven’ is a reverse alternation. A distinction is
16 also drawn between alternations with a strong verb source, such as *āðswerian* ‘to swear’ ~
17 *āðswaru* ‘oath’, and alternations with a weak verb target, like *bær* ‘bare’ ~ *barian* ‘to lay
18 bare’. Author (2014), Author (2015), and Martín Arista (2017) also underline the synchronic
19 relevance of alternations, which hold in pairs comprising the seven classes of strong verbs,
20 and the three classes of weak verbs, as well as their importance for the assessment of the
21 change from variable base morphology to invariable base morphology (Kastovsky 1992).

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In a study in the prefix *ge-*, Martín Arista (2012) describes this affix as the most widespread in Old English, both from the quantitative, and the qualitative point of view. To give just some examples, *ge-* is found in the inflection of the past participle, as in *gedrifēn* ‘driven’, as well as in the formation of nouns, such as *sweostor* ‘sister’ > *gesweostor* ‘sisters’; adjectives, like *swāt* ‘sweat’ > *geswāt* ‘sweaty’; and verbs, as in *rīnan* ‘to rain’ > *gerīnan* ‘to

1 wet with rain'. On the grounds the lack of semantic contrast between the simplex, and the
2 derived form, as in *eardung/geeardung* 'tabernacle', *gylden/gegylden* 'golden',
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4 *wærian/gewærian* 'to pass by', and *hlēowe/gehlēowe* 'in a sheltered manner', Martín Arista
5 (2012) describes a path of grammaticalization for the prefix starting from the Proto-Germanic
6 derivational prefix **ga-*, and leading to the inflectional *ge-* that is attached to the past
7 participle. This author quantifies the progressive loss of the derivational productivity of the
8 prefix, and the gradual increase in inflectional distribution to draw the conclusion that the
9 zero derived neuter noun contributes to the decategorialization of the prefix, which undergoes
10 grammaticalization due to overmarkedness, and ultimately becomes exclusively inflectional.
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21 As regards the mismatches in derivation, they have been identified in the formation of
22 adjectives (Martín Arista 2011b), and nouns (Martín Arista 2014). By gathering sets of near-
23 synonyms that share a lexemic root, such as *bebyrgung / byrging / bebyrgednes / byrignes /*
24 *gebyrgednes* 'bury', Martín Arista (2014) finds two types of mismatch in the formation of
25 nouns in Old English, namely, convergent derivation due to the competition of suffixes
26 (*hergung / hergað* 'harrying'), and convergent derivation that results from the competition of
27 bases (*riht / rihtwīs > rihtwīsnes* 'righteousness'). In general, such mismatching sets comprise
28 a zero derivative, and an affixal derivative (like *blōt*, and *blōtung* 'sacrifice'), or a derivative
29 with a more productive affix, and another one with a less productive affix (thus *bocræding*,
30 and *bocræde* 'reading of books'); or a recursive formation (the derivative of a derivative), and
31 a non-recursive one (as is the case with *onstyreðnes*, and *styrung* 'movement'). Redundant
32 derivation holds in pairs of adjectives like *langsum / langsumlic* 'tedious'. These mismatches
33 in the word-formation of Old English indicate *the coexistence of the output of at least two*
34 *waves of word-formation that configure two lexical layers, zero derivation, and affixation,*
35 *including recursive affixation* (Martín Arista 2014: 184).
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2 To summarize, Kastovsky (1992: 294) underlines the productive character of Old
3 English lexical derivations, which he considers transparent both formally, and semantically.
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5 The data confirm that this is largely correct, although opaque formations are far from
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7 exceptional. As it has just been said, opaqueness arises, at least in aspects of word-formation
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9 related to alternations, some specific affixes, and mismatches in derivation. Nevertheless, the
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11 formation of words in this period of the history of English is remarkably transparent for, at
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13 least, two reasons: the strong verb base of derivational morphology, and the derivation of
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15 already derived items. These reasons are discussed in turn.
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19 The first reason for the transparency of the derivations in Old English is pointed out by
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21 Kastovsky (1992: 294), who uses the term *word-family* to refer to morphologically related
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23 sets like the one presented below. The term *derivational paradigm*, which draws on Amanda
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25 Pounder's (2000) *lexical paradigm*, is preferred in this work because *derivational* insists on
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27 the morphological nature of the phenomenon while *paradigm* indicates a structured inventory.
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29 Indeed, the derivational paradigm relates all the non-basic forms to the base of derivation with
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31 which they share a lexemic root. In Old English, as in the Germanic languages in general, the
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33 strong verb is often the base of derivation of the whole paradigm (Elmar Seebold 1970; Frank
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35 Heidermanns 1993). For instance, among the many morphological relations holding in a
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37 derivational paradigm like the one of the strong verb (class IIIb) *belgan* 'to be or become
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39 angry', it is the case that the strong verb (class IIIb) *ābelgan* results from the prefixation of *ā-*
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41 to the base of derivation of the paradigm. Furthermore, *ābelgan* 'to make angry' has a zero
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43 derived noun based on the infinitive vowel, *ābylg* 'anger', on which the weak verb (class 1)
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45 *ābylgan* 'to irritate', and the suffixal noun *ābylgnes* 'offence' are formed; and a suffixed noun
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47 based on the past participle vowel with the suffix *-nes*, *ābolgennes* 'irritation' (< *ābelgan*,
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49 *ābolgen*). Derivational paradigms thus described, therefore, comprise the relevant processes
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51 (like affixation, and zero derivation), and units (lexemic roots, prefixes, and suffixes)
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1 whatever their formal, and semantic transparency is. In the part of the derivational paradigm
2 of *belgan* shown above, more formally transparent processes like prefixation, and less
3 transparent ones like zero derivation co-occur; as more semantically transparent affixes, like
4 the suffix *-nes*, do with less transparent ones such as the prefix *ā-*. In other words, derivational
5 paradigms reflect not only synchronic productivity but also diachronic recoverability (in
6 Detlef Stark's 1982 terminology). Finally, derivational paradigms guarantee the paradigmatic
7 approach to word-formation that the analysis of the derivation of derivatives that is discussed
8 below requires.

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19 The second reason for the derivational transparency of Old English word-formation is
20 the generalized formation based on derivatives that result from the same or similar
21 derivational processes. In Old English, the derivation of derivatives is found mainly in the
22 formation of prefixed strong verbs as well as suffixed nouns, and adjectives (Author 2017;
23 Veá Escarza 2012, 2016). For reasons of space, this section focuses on the derivation based
24 on the strong verbs, and is restricted to the repetition of a given process, as is the case, for
25 instance, with the prefixation of a prefixal derivative.

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36 As far as strong verbs are concerned, it is necessary to distinguish between what Juan
37 de la Cruz (1975) calls *the pure prefixes* from the preverbs of the adpositional, and adverbial
38 classes.³ The pure prefixes, which do not have a prepositional counterpart or have one with a
39 different meaning, include the following elements, which are ordered by type frequency, from
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³The pure prefixes undergo a process of semantic weakening that results in a remarkable degree
of interchangeability (Dorothy Horgan 1980; Risto Hiltunen 1983; Michiko Ogura 1995).
Eventually, the prepositions and adverbs of place and direction grammaticalize as markers of
telicity (Laurel Brinton 1988; Brinton and Elizabeth Closs Traugott 2005). See also Martín
Arista and Cortés Rodríguez (2014).

1 the most to the least frequent: *ge-* (*gebringan* ‘to bring’), *ā-* (*āberan* ‘to bear’), *be-* (*bebītan*
 2 ‘to bite’), *on-* (*oncunnan* ‘to accuse’), *for-* (*forlēogan* ‘to lie’), *tō-* (*tōstincan* ‘to distinguish by
 3 smell’) y *of-* (*ofđīnan* ‘to be too moist’)⁴. By type frequency, the free forms that function as
 4 preverbs include *ofer-* (*oferberan* ‘to carry over’), *ođ-* (*ođiernan* ‘to run away’), *in-*
 5 (*inasendan* ‘to send in’), *under-* (*underwītan* ‘to write at the foot of’), *đurh-* (*đurhđrīfan* ‘to
 6 drive through’), *wiđ-* (*wiđspurnan* ‘to hit against’), *forđ-* (*forđhrēosan* ‘to rush forth’), *ymb-*
 7 (*ymblicgan* ‘to surround’), *ūp-* (*ūpārīsan* ‘to rise up’), *ūt-* (*ūtātēon* ‘to draw out’), *fore-*
 8 (*foresittan* ‘to preside over’), *æt-* (*ætslāpan* ‘to sleep beside’), *geond-* (*geondsāwan* ‘to
 9 scatter’), *eft-* (*eftārīsan* ‘to rise again’), *fram-* (*frambringan* ‘to take away’). The prototypical
 10 pattern of derivation of derived verbs consists of a base prefixed with a pure prefix to which a
 11 free form is attached. The combinations *ūp-ā-*, and *ūt-ā-* are the most frequent (Martín Arista
 12 2011b, 2014), thus: *ūpāblāwan* ‘to blow up’, *ūpābreccan* ‘to break out; boil’, *ūpābregdan* ‘to
 13 lift up; expand’, *ūpāhebban* ‘to lift up; fly’, *ūpāhōn* ‘to hang up’, *ūpālūcan* ‘to eradicate’,
 14 *ūpārīsan* ‘to rise up’, *ūpāspringan* ‘to spring up’, *ūpāstīgan* ‘to rise’, *ūpātēon* ‘to draw up’,
 15 *ūpāweallan* ‘to well up, boil up’, *ūpāwegan* ‘to lift up’; *ūtāberstan* ‘to burst out’, *ūtābreccan*
 16 ‘to break out’, *ūtādelfan* ‘to dig out’, *ūtādrīfan* ‘to drive out’, *ūtāfaran* ‘to depart’, *ūtāflōwan*
 17 ‘to flow out’, *ūtāscēotan* ‘to sprout forth’, *ūtāslēan* ‘to strike outwards’, *ūtāslīdan* ‘to slip
 18 forwards’, *ūtāspīwan* ‘to spew forth’, *ūtātēon* ‘to draw out’, *ūtāwindan* ‘to fall into’. As
 19 Martín Arista and Cortés Rodríguez (2014) show, there are no derivatives that display three
 20 preverbs, neither can bound forms (the pure prefixes) attach after free forms (the preverbs).
 21 On the other hand, two bound forms can co-occur, as in *on-ā-*, *of-ā-*: *onāwinnan* ‘to fight
 22 against’, *onāslīdan* ‘to fall away’, *onāsāwan* ‘to implant’, *onārīsan* ‘to rise up’, *onāhōn* ‘to
 23 hang on’, *onāhebban* ‘to lift up’, *onāgēotan* ‘to infuse’; *ofāceorfan* ‘to cut off’, *ofādrincan* ‘to
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 59 ⁴ See Klaus Dietz (2007, 2010) on Old English affixation.
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1 drain', *ofāhēawan* 'to cut off', *ofāniman* 'to take away', *ofāsceacan* 'to shake off', *ofāsciran*
2 'to cut off', *ofāsēoðan* 'to purge', *ofāslēan* 'to smite off', *ofāsnīdan* 'to cut off', *ofāstīgan* 'to
3 descend', *ofātēon* 'to pull out', *ofāweorpan* 'to throw off'. The pure prefixes *ā-*, *be-*, *ge-* can
4 attach after another pure prefix (Martín Arista 2011b, 2014), as in the following sequences:
5 *ge-ā-* (*geārīsan* 'to rise'), *of-ā-* (*ofāstīgan* 'to descend'), *on-ā-* (*onāgēotan* 'to infuse'), *tō-ā-*
6 (*tōātēon* 'to draw in'), *ā-be-* (*ābetēon* 'to accuse'), *tō-be-* (*tōbeflōwan* 'to flow up to'), *on-be-*
7 (*onbebringan* 'to bring upon'), *on-ge-* (*ongefealdan* 'to wrap'), *tō-ge-* (*tōgesettan* 'to put to').
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9 In sum, in the formation of strong verbs based on derived strong verbs the pure prefixes *a-*,
10 *be-*, *ge-* stand out not only for their type frequency but also, from the qualitative point of
11 view, because, unlike the other prefixes, which can only precede a pure prefix, they can attach
12 after another pure prefix.

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27 As regards nouns (Vea Escarza 2016), the suffixation of already suffixed derivatives
28 comprises the affix sequences that follow. They are illustrated with an instance for which the
29 strong verb functioning as the base of derivation is indicated: *-t-el* (*tihtle* 'accusation' < *tiht*
30 'charge' < *tēon* 'to accuse'), *-t-en* (*tyhten* 'incitement' < *tiht I* 'charge' < *tēon* 'to accuse'), *-t-*
31 *end* (*tyhtend* 'inciter' < *tyht* 'instruction' < *tēon* 'to pull'), *-ð-ere* (*māðere* 'mower' < *māð*
32 'cutting of grass' < *māwan* 'to mow'), *-el-nes* (*crypelnes* 'paralysis' < *crypel* 'crippel' <
33 *crēopan* 'to creep'), *-els-nes* (*wrigelnes* 'protection' < *wrigels* 'covering' < *wrēon* 'to cover'),
34 *-end-nes* (*āblinnendnes* 'cessation' < *āblinnend*, *āblinnan* 'to cease' < *blinnan* 'to cease'), *-*
35 *ing-nes* (*swēgungness* 'sound' < *swēging* 'sound' < *swōgan* 'to sound'), *-lic-nes*
36 (*ācumendlicnes* 'possibility' < *ācumendlic* 'tolerable' < *ācuman* 'to come'), *-or-nes* (*slipornes*
37 'filthiness' < *slipor* 'filthy' < *slīpan* 'to slip'), *-ð-nes* (*gesihðnes* 'vision' < *gesiht* 'sight' <
38 *sēon* 'to see'), *-ð-rāden* (*māðrāden* 'mowing' < *māð* 'cutting of grass' < *māwan* 'to mow'),
39 *-el-ung* (*setlung* 'sitting' < *setl* 'seat' < *sittan* 'to sit'). As these instances evidence, the suffix *-*
40 *nes* in the final position (rightmost) as well as the dental suffix *-t / -ð*, in prefinal position

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outnumber other suffixes as to distribution. These suffixes form abstract nouns from adjectives, verbs, and other nouns.

As for the derivation of derived adjectives by suffixation (Author 2016) from strong verbs, the following combinations of elements take place: *-or-ig* (*heolstrig* ‘shadowy’ < *heolstor* ‘dark’ < *helan* ‘to conceal’), *-cund-lic* (*metcundlic* ‘metrical’ < *metcund* ‘metrical’ < *metan* ‘to measure’), *-en-lic* (*gelumpenlic* ‘occasional’ < *gelumpen*, *gelimpan* ‘to happen’), *-end-lic* (*bebēodendlic* ‘imperative’ < *bebēodend* ‘master’), *-fæst-lic* (*gemetfæstlic* ‘moderate’ < *gemetfæst* ‘moderate’ < *metan* ‘to measure’), *-ful-lic* < (*tēonfullic* ‘abusive’ < *tēonfullic* ‘evil’ < *tēon* ‘to hurt’), *-ol-lic* (*swicollic* ‘fraudulent’ < *swicol* ‘false’ < *swīcan* ‘to depart’), *-ð-ig* (*cystig* ‘charitable’ < *cyst* ‘free will’ < *cēosan* ‘to choose’), *-ð-lēas* (*cystlēas* ‘worthless’ < *cyst* ‘free will’ < *cēosan* ‘to choose’), *-ð-sum* (*genyhtsum* ‘abundant’ < *genyht* ‘abundance’ < *genugan* ‘to suffice’). These instances show that in this type of derivation the most frequent elements are the suffix *-lic*, which forms adjectives of relation, in final position, and the suffix *-t / -ð*, in prefinal position (Author 2016).

Although only the main areas of derivation on derivatives have been examined, the overall picture that emerges from the evidence gathered in this section is one of remarkable efficiency of the derivational apparatus, which compensates for the lack of loanwords in many parts of the lexicon, and reinforces the consistently Germanic character of the vocabulary of Old English. It also follows from this discussion that the processes of word-formation interact with one another in complex ways, and moreover, that synchronic, and diachronic facts overlap in derivation. These questions are addressed in the following sections.

3. Productivity in lexical derivation

Lexical creation can be considered from two perspectives: lexical creation as a process, and lexical creation as a product. In this section, it is held that recursivity contributes to the

1 economy, and potential scope of the lexicon by maximizing lexical resources through the
2 embedding of lexical items into other lexical items. Recursivity defined in this way depends
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4 on lexical productivity. That is, a lexical item can be embedded in a more complex lexical
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6 item if, and only if a fully operational process of word-formation motivates the resulting
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8 structure. This means that recursivity in word-formation, as a property that reflects the
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10 dynamic, and creative nature of lexical creation, has to be studied in terms of immediate
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12 constituents, given that it is concerned with the final outcome of derivation, and potential new
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14 formations.⁵
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19 Derivational depth (Martín Arista 2013) is understood as the product of successive
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21 word-formation processes. This means that formations can be decomposed into their minimal
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23 constituents, regardless of the productive or non-productive character of the derivational
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25 steps. A further difference between recursivity, and derivational depth lies in the number of
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27 embeddings relevant to description. Whereas recursivity is concerned with the final
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29 derivational step exclusively, derivational depth, so to say, tells the whole derivational story,
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31 and analyses all derivational steps, including those that entail non-productive processes. It
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33 follows from these definitions that, in word-formation, latest developments, and productivity
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35 (that is, mostly synchronic facts) are relevant to recursivity, whereas non-productive patterns
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37 (resulting from diachronic evolution mainly) bear on derivational depth. Furthermore, in the
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39 study of a natural language, recursivity has to be considered in an open lexical paradigm,
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51 ⁵ The approach to productivity adopted in the article is strictly qualitative. That is, productivity
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53 is not a quantification of the output of the processes of word-formation, or their potential output.
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55 On the assessment of the productivity of Old English affixes through several indexes, see
56
57 Raquel Mateo Mendaza (2012, 2014, 2015).
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1 while in historical linguistics derivational depth reflects a closed lexical paradigm, which
2 poses some problems of data but has the advantage of allowing for an exhaustive description.
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4 Bearing this distinction between recursivity, and derivational depth in mind, a
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6 typology of recursive word-formation phenomena in Old English can be proposed. It is based
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8 on two criteria, namely type of embedding, and place of embedding.
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11 With respect to the type of embedding, broad embedding is distinguished from narrow
12 embedding. Broad embedding requires process repetition (as in the prefixation inside
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14 prefixation, like *un-ge-witt* ‘folly, madness’ in figure 1, which consists of two derivational
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16 steps). Notice that in figure 1 capital letters represent linguistic units, and subscripts stand for
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18 categories. Although in *un-ge-witt* in figure 1 the bases of the two prefixations involved are
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20 nominal, it is not a requisite of broad embedding that the category of the base is preserved, as
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22 the different categorial subscripts in figure 1 indicate.
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34 $[[A_v B_w]_x [B]_y]_z$

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39 $[\quad]_z$



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48 $[]_x []_y$

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53 *un-ge-witt* ‘folly, madness’

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56 Figure 1: Broad embedding.
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1 Narrow embedding does not entail rule repetition (as in the prefixation *ge-witt* ‘folly,
 2 madness’ in figure 2, which comprises a single derivational process). Narrow embedding,
 3 unlike broad embedding, inserts a category into the same category, with which the categorial
 4 feature is repeated, rather than the morphological process. Even if this condition is accepted,
 5 for narrow embedding to produce a recursive structure it is necessary to provide the prefix
 6 with a categorial feature, in such a way that, for instance, a noun is embedded in a complex
 7 nominal structure. The subscript x in figure 2 shows that narrow embedding is category-
 8 preserving.
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24 $[A_x B_x]_x$



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41 *ge-witt* ‘understanding’

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44 Figure 2: Narrow embedding.

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48 As can be seen in figures 1, and 2, broad embedding can change lexical category
 49 whereas narrow embedding depends on the categorial feature, which has to be kept constant.
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 51 Recursive formations in the lexicon result from the derivation of derived bases, not simply
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 53 from the derivation of simplex bases that produces derivatives of the same lexical category.
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That is, morphological recursivity (or recursivity proper) can be represented as is shown in figure 3:

[[A_v B_w]_x [B]_y]_z

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[] []

ā-blāc-nes ‘pallor, gloom’

Figure 3: Morphological recursivity.

This definition of recursivity is applicable to individual lexical items. In order to apply it to processes of lexical derivation as a whole, it is necessary to consider the second criterion on which the typology of recursive word-formation phenomena in Old English is based: place of embedding. Place of embedding is mainly a question of adjacency. Harry Van der Hulst (2010: xxiv) distinguishes *nested* from *tail* recursive segments. In nested recursive formations, a segment is inserted into the middle of another segment, which becomes discontinuous as a result of the recursive operation. In tail recursive formations, a segment is added to the left or the right of another segment, which remains continuous in spite of the recursive operation. In an affixal language such as Old English, which does not use infixation,

1 recursive word-formation exhibits tail recursivity, rather than nested recursivity. In this
2 respect, prefixation, and suffixation can be subsumed under the heading of affixation, since
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4 both represent tail phenomena if they apply recursively. For instance, *ā-blāc-nes* ‘pallor,
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7 gloom’ in figure 3 displays tail recursivity of the suffixal type.
8

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10 Zero derivation, in the sense of derivation without derivational morphemes, raises
11 some interesting questions concerning the distinction between tail, and nested recursivity
12 because, according to the representation in figure 3, recursivity turns up only if a given
13 process is repeated. The similarity of prefixation, and suffixation in this respect has already
14 been stressed, but zero derivation constitutes a substantially different process. Indeed, it
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16 resorts to inflectional means to perform derivational functions or does not insert any
17 morphemes at all. For example, *blice* ‘exposure’ (< *blīcan* ‘to shine’) has explicit inflection,
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19 but *glid* ‘slippery’ (< *glīdan* ‘to slip’) or *wīg* ‘fight’ (< *wīgan* ‘to fight’) do not. For this
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21 reason, we draw on Roberto Torre Alonso (2010; 2011) for the concept of process feeding,
22
23 which is defined as the combination of different processes of word-formation to turn out
24 complex derivatives based on complex bases. Process feeding is represented in figure 4,
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26 where different types of brackets have been used to mark different morphological processes:
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28 square brackets represent tailed processes whereas nested processes are indicated by means of
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30 round brackets.
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46 $[(A_v B_w)_x [B]_y]_z$

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ǣt-ing ‘eating, pasture’ (after zero derivation *etan* ‘to eat’ > *ǣt* ‘food’)

Figure 4: Process feeding.

As can be seen in figure 4, the strong verb *etan* ‘eat’ produces the zero derivative *ǣt* ‘food’ which, in turn, serves as base of derivation for the suffixed noun *ǣt-ing* ‘eating, pasture’. It is not possible to consider the formation of *ǣt-ing* ‘eating, pasture’ recursive unless the type of morphological process at stake is ignored, and the repetition of lexical derivation is considered recursive, in a holistic approach. More importantly, the zero derivation of *ǣt* ‘food’ from the strong verb is based on *Ablaut*, which constitutes an instance of nested embedding. This leads to a generalization concerning the type, and the place of embedding: morphological recursivity, at least in Old English, calls for broad embedding, and tailed embedding. Tentatively, we use the term *lexical recursivity* to refer to recursive phenomena that fall under the nested type. Lexical recursivity can be based on formal modification, as in *stincan* (strong IIIa) ‘to stink’ > *stenc* ‘odour, scent; stench’ > *stencan* (weak 1) ‘to stink’; or on recategorization without formal change, as in *ān*_{Numeral} ‘one’ > *ān*_{Adjective} ‘alone, single’ > *ān*_{Adverb} ‘alone, only’. Both types of lexical recursivity require process repetition. The consequence of this condition is that lexical recursivity without formal change is rare. Lexical recursivity with formal change is more frequent, but still represents a less generalized phenomenon than affixation or compounding.

4. *Lexical graduality*

The Layered Structure of the Word (LSW), as presented in Martín Arista (2008; 2009; 2011a), distinguishes, by drawing on Van Valin and LaPolla (1997), and Van Valin (2005),

1 three word layers: Nucleus, Core, and Word. The fourth layer, the Complex Word, which has
 2 scope over the layer of the Word, is relevant for syntactically motivated word constituents.
 3
 4 Each layer has an associated set of lexical arguments, and lexical operators, so that lexical
 5 arguments are governed by the principle of structural dependence whereas operators abide by
 6 the principle of operator scope. In the LSW, as presented in figures 5, and 6, the Nucleus
 7 constitutes the base of derivation in a minimal constituent analysis in terms of which
 8 derivational morphemes with a syntactic counterpart are represented as arguments, and
 9 derivational morphemes without a syntactic counterpart are accounted for by lexical
 10 operators. An illustration with *inscēawere* ‘inspector’ (Martín Arista 2011a: 403) is given in
 11 figure 5, which shows the constituent projection only.

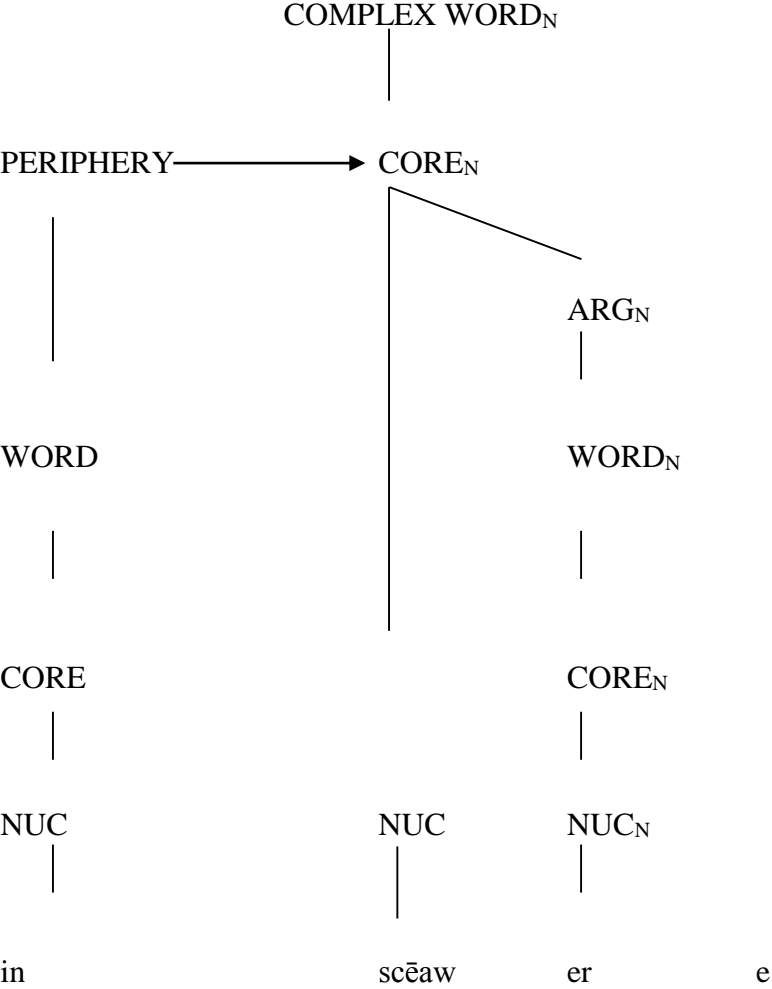


Figure 5: *Inscēawere* ‘inspector’ in the LSW.

Trees like the one in figure 5 constitute instances of two morphological constructions with cross-linguistic relevance (Martín Arista 2008, 2009): the endocentric construction, in which the morphological features (including, at least, lexical category) are projected from the Nucleus; and the exocentric construction, in which these features are projected from a non-nuclear element, and percolate to the Core node. The layered representation of *up-ferian* ‘raise’ in figure 6 illustrates the endocentric morphological construction, while *inscēawere* ‘inspector’ in figure 5 is an instance of the exocentric morphological construction (Martín Arista 2011a: 398). Notice that separable directionals like *up* in *up-ferian* ‘raise’ work as Argument-Adjuncts in a Word Core because they express compulsory direction. Non-separable directionals constitute lexical operators.

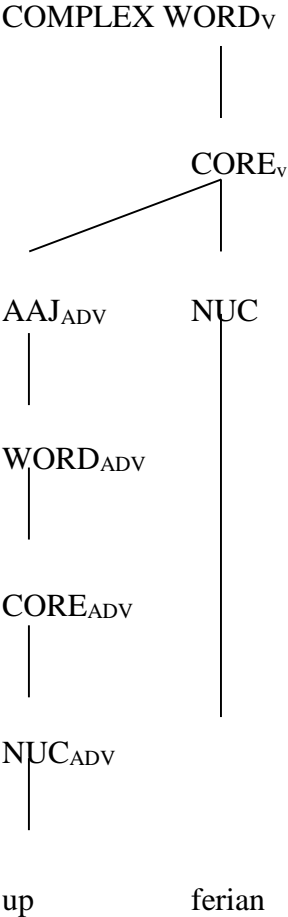
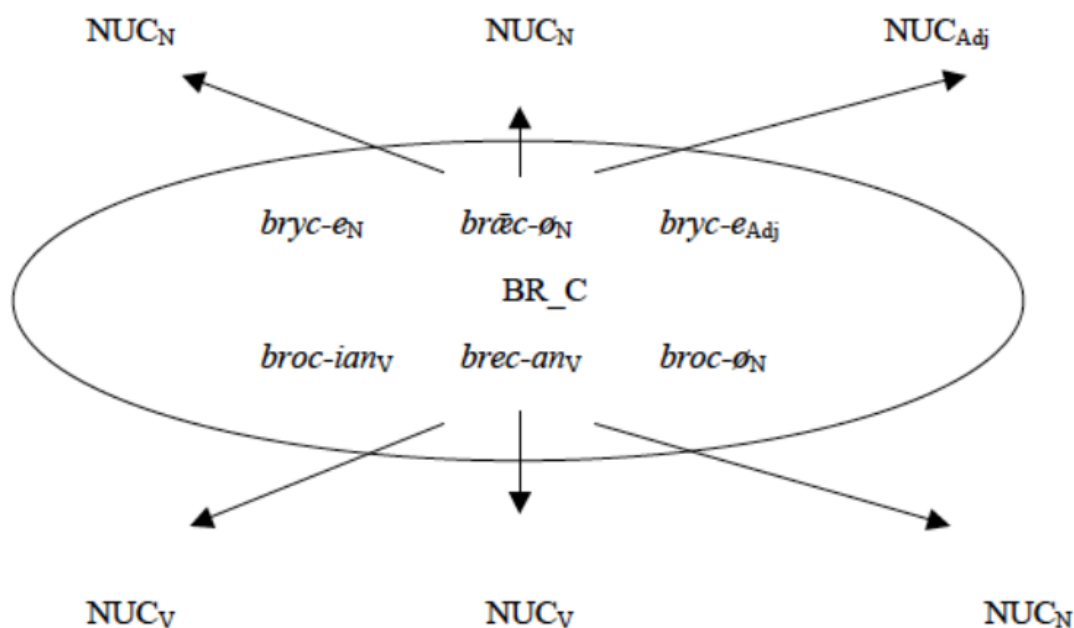


Figure 6: *Up-ferian* ‘to raise’ in the LSW.

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2 The scope of the Nucleus of the LSW is determined by the Nuclear Shell Principle
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4 (NSP, Martín Arista 2011a: 410). On the basis of the NSP, the Nucleus of the LSW identifies
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6 opaque non-productive stem formations that are recoverable in the diachrony only. Put in
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8 other words, the motivation of the NSP is the loss of lexical productivity that can be attributed
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10 to diachronic evolution. The NSP leaves recoverable formations aside to concentrate on
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12 productive formations. This applies both to pre-derivational inflection, and derivation.
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14 Consider, as illustration, the derivatives of the class IV strong verb *brecan* ‘to break’: *brēc*
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16 ‘breaking, destruction’, *broc* ‘affliction, misery, toil, adversity; disease; fragment; breach’,
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18 *brocian* ‘to crush, hurt, afflict, molest; blame’, *bryce* ‘breach’, and *bryce* ‘fragile’.
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51 Figure 7: The NSP as applied to the paradigm of BRECAN.
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56 As shown in figure 7, the derivational paradigm of BRECAN is partly transparent, and
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58 partly opaque. *Forbrecan* ‘to break in pieces’, for instance, results from a transparent process
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1 of prefixation. The opaque part of the derivational paradigm of *BRECAN* can be explained by
2 means of the NSP. Thus, the NSP makes for the integration of diachronic facts into the LSW,
3
4 and, more importantly, separates non-productive from productive processes in the synchrony.
5
6 In the case of the derivational paradigm of *BRECAN*, the NSP stipulates that the nouns *bræc*,
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8 *broc*, and *bryce*, the adjective *bryce*, the weak verb *brocian*, and the strong verb *brecan*
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10 ultimately constitute instantiations of the stem *BR_C*.
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14 While trees represent hierarchy, and dependency relations in the word, templates,
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16 which inherit the semantics, and morphology of the word from trees, guarantee the form, and
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18 order of word constituents. In the remainder of this section the template is re-considered in the
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20 light of the evidence provided by the analysis of recursive word-formations, and the
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22 conclusion is reached that it cannot account for recursivity, and derivational depth
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24 simultaneously. If the focus is on derivational depth, the template with several functional slots
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26 holds good. If, on the contrary, the analysis revolves around recursivity, a template with one
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28 functional slot represents productive, and potential formations more faithfully.
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33 The morphological template of Old English has two basic properties: first, it is
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35 arranged centripetally, that is, it draws on the general principles of semantic organisation that
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37 attribute the core meaning to the more central positions, and the peripheral meaning to the less
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39 central position (Martín Arista 2011a); and, second, it combines the stepwise processing of
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41 complex words with a monostratal description of linguistic structures (Van Valin and LaPolla
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43 1997; Van Valin 2005).
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48 According to Martín Arista (2011a: 404), the methodology for defining a template
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50 consists of two steps, revolving around complexity, and pre-derivational inflection. In the
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52 discussion that follows, another step is added, which has to do with the aspects of recursivity
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54 considered in the previous section.
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As for complexity, it is necessary to determine the maximal degree of unfolding of the complex word. In Old English, the maximal degree of derivational complexity, as has been pointed out by Vea Escarza (2012), is represented by instances such as the verb *to-for-an-settan* ‘set before’, the noun *ge-mynd-ig-lic-nes* ‘remembrance’, and the adverb *nyht-sum-līc-e* ‘abundantly’. It must be borne in mind in this respect that no derivatives with three prefixes, and three suffixes can be found. The maximal degree of implemented centripetal complexity is two affixes in the prefield, and another two in the postfield of the word, as in *un-ful-frem-ed-nes* ‘imperfection’, and *un-be-grīp-end-lic* ‘incomprehensible’. Whereas nouns, and adjectives admit two prefixes, and another two suffixes, verbs can take two prefixes, but just one suffix, such as *-sian* or *-ettan*, and even this is rare.

As regards the nature of the processes that turn out the bases of derivation of complex words, such bases can be modified by non-derivational morphological means in two different ways, by pre-derivational inflection, and by zero derivation. Both can resort to inflectional morphemes to produce the bases that are inputted to fully derivational processes. With respect to pre-derivational inflection, this does not represent a generalized phenomenon in Old English. The few instances that turn up qualify as fossilized formations, even though they are still analyzable, thus: *ælmesbæd* ‘gratuitous bath’ (genitive), *geomorfrod* ‘very old’ (comparative), *endemestnes* ‘extremity’ (superlative), *ōlehtung* ‘flattery’ (preterit), *ācwellednes* ‘slaughter’ (past participle), *āwyrigende* ‘accursed’ (present participle). Regarding zero derivation, in Old English it comprises derivation without derivational morphemes (as in *blice* ‘exposure’ < *blīcan* ‘to shine’), and derivation without morphemes, either derivational or inflectional (as is the case with *glid* ‘slippery’ < *glīdan* ‘to slip’). Both types can be subdivided into derivation without *Ablaut* (Martín Arista 2017), such as *bīd* ‘delay’ (from *bīdan* ‘to delay’), and derivation with *Ablaut*, as is the case with *drāf* ‘action of driving’ (from *drīfan* ‘to drive’).

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As far as the degree of repetition of the processes is concerned, it turns out that word-formation in Old English conveys process repetition, strictly recursive formations (the repetition of the same process), and loose recursivity (the combination of processes). These processes, moreover, can combine in complex ways, although this is not always necessarily the change, with recategorization, formal change, and *Ablaut*. Furthermore, formal change can be attributed to derivational or inflectional morphemes, in which case inflection is split between the one that takes place before derivation, and the one that takes place after derivation.

Considering that affixation takes up structural positions whereas pre-derivational inflection, and zero derivation do not, the template in figure 8 represents the maximal morphological projection, which is required for derivations like *ealdor-dōm-lic-nes* ‘authority’. Unlike the morphological template proposed by Martín Arista (2011a), which defines two slots in the Prefield, and another two in the Postfield of the word, three positions are distinguished before the Nucleus, and three more after it.

[PREFIELD 3] [PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]
[POSTFIELD 3]

Figure 8: The maximal morphological template of Old English.

The maximal template can be broken down into other templates consisting of just the Nucleus, or the Nucleus, and different slot combinations in the Prefield, and the Postfield. They are illustrated in figure 9.

[PREFIELD 1] NUCLEUS

ed-wist ‘substance’

[PREFIELD 2] [PREFIELD 1] NUCLEUS

of-ā-drincan ‘drain’

NUCLEUS [POSTFIELD 1]

arod-scipe ‘energy’

NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

ðēow-dōm-hād ‘service’

[PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

un-hīersum-līc-e ‘disobediently’

[PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1]

ūp-ā-fang-nes ‘reception’

[PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

un-ge-sib-sum-nes ‘discord’

NUCLEUS [POSTFIELD 1] [POSTFIELD 2] [POSTFIELD 3]

heals-ig-end-lic ‘imploring’

[PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2] [POSTFIELD 3]

ge-mynd-ig-lic-nes ‘remembrance’

Figure 9: The non-maximal morphological templates of Old English.

The maximal template in figure 8 imposes, as has been said, the condition that pre-derivational inflection, and zero derivation must occur in the Nucleus, otherwise there are not enough functional slots available. This is compatible with the Nuclear Shell Principle, or NSP, which establishes the boundaries of derivational analyzability. Moreover, the template, revised as has been presented above, can deal with broad embedding, or process repetition,

1 such as *un-ge-witt* ‘folly, madness’ in figure 1; narrow embedding or derivation without
2 recategorization, as in *ge-witt* ‘understanding’, given in figure 2; morphological recursivity or
3 derivation of derived bases, as is the case with *ā-blāc-nes* ‘pallor, gloom’ in figure 3; process
4 feeding, or the combination of different processes of word-formation resulting in complex
5 derivatives based on complex bases, such as *āet-ing* ‘eating, pasture’ (after zero derivation
6 *etan* ‘to eat’ > *āet* ‘food’); and lexical recursivity involving recursive phenomena that fall
7 belong to the nested type, both with formal change, as is can be said of *stinčan* (strong IIIa)
8 ‘to stink’ > *stenc* ‘odour, scent; stench’ > *stencan* (weak 1) ‘to stink’; and without formal
9 change, as happens in *ān*_{Numeral} ‘one’ > *ān*_{Adjective} ‘alone, single’ > *ān*_{Adverb} ‘alone, only’.

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22 This template has three advantages for the analysis of recursive phenomena. In the
23 first place, it makes allowance for the reformulation of the principle of lexical integrity. In
24 this sense, all fossilized inflection takes place before derivation. Zero derivation, in turn,
25 occurs before affixation, so that non-productive inflection, and derivation are isolated from
26 the rest of derivational processes. This follows to a great extent from the definition of zero
27 derivation as derivation without derivational morphemes. If zero derivation uses inflectional
28 morphemes to perform a derivational function, it is to a certain extent predictable that the
29 boundary between inflection, and zero derivation is difficult to draw. Therefore, it is advisable
30 to put aside the two phenomena that rely on inflectional morphemes, that is, pre-derivational
31 inflection, and zero derivation. This approach to pre-derivational inflection is compatible with
32 current practice in RRG, in which phrasal, and clausal operators guarantee the expression of
33 the relevant inflectional morphemes.

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51 The second advantage of the revised template is that recursive phenomena of word-
52 formation are divided into two types: those that can apply gradually, and those that do not
53 apply gradually but simultaneously. Affixation, which applies gradually, does not abide by
54 the NSP, whereas zero derivation, which resist gradual analysis, is governed by the NSP. The
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1 arrows in the figure in 7 are meant to represent the simultaneous formation of all zero
2 derivatives, so that, for instance, it is not necessary to form the verb *brocian* on the noun
3 *broc*; both are turned out simultaneously. This has an important consequence. If zero
4 derivation falls under the scope of the NSP, it cannot be recursive because all zero derivatives
5 of a given base are produced simultaneously. The term *lexical recursivity*, as has been
6 tentatively defined above, is no longer necessary, given that the NSP requires that the Nucleus
7 is provided with any formal, and categorial specifications previous to productive derivation.
8 Even more, nested recursivity does not take place in Old English, once zero derivation, the
9 only derivational process that causes nesting, is considered non-recursive.
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21 Thirdly, the revised template can deal with instances of redundant derivation, which
22 can be found among nouns like *framfær/framfærelde* ‘departure’, *hæle/hæleð* ‘man, hero’, and
23 *hwearf/hwearft* ‘exchange’; and adjectives such as *lýt/lýtrel* ‘little’, *lēof/lēoffæst* ‘dear’ and
24 *frec/frecful* ‘greedy’. These pairs of derivatives consist of a zero formation (typically on a
25 strong verb) and an affixed synonym, thus *nytt/nyttol* ‘useful’. The origin of these pairs lies in
26 the coexistence of two diachronic layers in the lexicon (Martín Arista 2011b, 2014). Thus, the
27 zero derivative *nytt* ‘useful’ (from *nēotan* ‘to use’) is found in the lower (older) layer, while
28 the affixal *nyttol* ‘useful’ belong in the upper (newer) layer. The NSP requires that the first
29 member of these pairs is immediately ready as a Nucleus whereas the second member of these
30 pairs is a product of the LSW, and is accounted for by the revised template presented in figure
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48 It has to be remarked that productive processes that are going through a process of
49 lexicalization represent recursivity although the derivation is no longer analyzable. In other
50 words, they cannot not fall under the scope of the NSP. For instance, the prefixation of *ā-*, *be-*
51 , *for-*, *ge-*, *on-*, and *tō* has lost semantic transparency, but remains recursive. The loss of
52 semantic transparency of the prefixes can be seen clearly in recursive formations in which the
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1 prefix to the left performs the telic function formerly realized by the prefix to the right in a
2 non-recursive derivative. This is the case with instances like *of-ā-drincan* ‘to drain; quench’,
3
4 in which the prefix *of-* is telic, the same as *ā-* in *ā-drincan* ‘to drain; quench’. As it turns out,
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6 many pairs of verbs can be found in which the meaning of the recursive formation is hard to
7
8 distinguish from the one of the non-recursive formation. An illustrative pair is formed by *be-*
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10 *fealdan*, and *to-be-fealdan*, both conveying the meaning ‘to fold together’.⁶
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14 Recursive formations such as *līht-ing-nes* ‘lightness of taxation’, *un-tō-sliten*
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16 ‘uninjured’, *on-ge-fealdan* ‘to wrap’ are not problematic for a decompositional template
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18 based on the principles of minimal constituent analysis. However, if the focus is on
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20 recursivity, that is, on fully productive processes, a gradual template such as the one given in
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22 figure 10 has the significant advantage of representing the productive part of derivations such
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24 as *of-ā-drincan* ‘to drain; quench’, and *un-ā-rīmed* ‘unnumbered’, namely the attachment of
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26 the prefix *of-*, and *un-* respectively.
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34 Base [affix]

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36 *un-ge-scēad-wīs-lic* ‘irrational’

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39 un [*gescēadwīslīc*]

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41 Figure 10: Gradual template.
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46 A decompositional template based on minimal constituent analysis reinforces the
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48 productive character of word-formation but requires a strong formulation of the NSP, which
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50 requires that all non-productive formations occur inside the Nucleus of the Word, including
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56 ⁶ See Martín Arista and Cortés Rodríguez on the incorporation of lexicalization and
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58 grammaticalization to the LSW.
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1 zero derivation, and fossilized inflection. Conversely, a gradual template based on immediate
2 constituent analysis does not depend on a maximized Nucleus but imposes the listing in the
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4 lexicon of non-productive formations or the generalization of redundancy rules, with the
5
6 corresponding impact on the productivity of derivational morphology as a whole.
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10 If the focus is on diachronic linguistics, a template based on minimal constituent
11 analysis guarantees a detailed description of the derivational steps of the word, including
12 those with affixes that have lost semantic transparency even though they keep formal
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14 analyzability. If the aim is synchronic linguistics, a template defined on the basis of
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16 immediate constituent analysis has the advantage of identifying fully productive processes of
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18 word-formation, and, more importantly, its predictive power is undoubtedly higher than that
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20 of the template based on minimal constituent analysis.
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26 In short, the question at stake is to opt for word-formation as a product or word-
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28 formation as a process. In Pounder's (2000) terminology, it seems that a choice has to be
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30 made between the lexical paradigm or product of word-formation, and the morphological
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32 paradigm or system of rules, and principles underlying the derivational morphology of the
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34 language. The study of a historical language such as Old English clearly favors the
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36 decompositional template, but the gradual template is more likely to enjoy typological
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38 applicability.
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45 **5. Conclusion**

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47 This article has advanced a typology of recursive word-formation phenomena based on the
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49 data provided by a language with generalized, and fairly transparent word-formation, such as
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51 Old English. The term *recursivity* has been restricted to productive phenomena that take place
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53 on the synchronic axis, as well as for latest developments, and potential formations. Dealing
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2 with a historical language, considerable attention has been paid by this article to derivational
3 depth, defined as the cumulative effect of recursivity throughout diachronic evolution.

4
5 The two criteria for the typology of recursive phenomena are type of embedding, and
6 place of embedding. In terms of type of embedding, morphological recursivity requires broad
7 embedding, whereby a derived base of derivation functions as base of another derivation.

8
9 Broad embedding is constrained for process. If the two processes involved in the derivation
10 are not of the same type, process feeding rather than morphological recursivity take place.

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12 Regarding place of embedding, morphological recursivity in Old English is exclusively of the
13 tail type.

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15 Lexical recursivity has been tentatively proposed as the product of narrow embedding
16 or nested embedding but the term is not necessary if the revised template requires that all
17 unproductive formations, both of an inflectional, and of a derivational nature, take place
18 inside the Nucleus of the LSW. The combination of the revised template, and the NSP
19 redefines graduality by establishing a relative order of morphological processes in terms of
20 which derivation takes place before inflection. Moreover, the revised template distinguishes
21 simultaneous processes such as zero derivation from gradual processes like affixation.

22
23 Finally, the question of the decompositional vs. the gradual morphological template
24 seems to be one of perspective. A more diachronically oriented analysis is likely to opt for a
25 decompositional template, whereas a more synchronically directed study that aims at
26 typological validity will probably favor the gradual template with one functional slot. It
27 remains for future research to determine to what extent the gradual template is basically a
28 construction of affixation, in such a way that the template inventory of specific languages is
29 comprised of the several degrees of complexity admitted by the decompositional template.

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Figures

$[[A_v B_w]_x [B]_y]_z$

$[\quad]_z$



$[]_x []_y$

un-ge-witt ‘folly, madness’

Figure 1: Broad embedding.

$[A_x B_x]_x$



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ge-witt ‘understanding’

Figure 2: Narrow embedding.

$[[A_v B_w]_x [B]_y]_z$

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[] []

ā-blāc-nes ‘pallor, gloom’

Figure 3: Morphological recursivity.

$[(A_v B_w)_x [B]_y]_z$

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() []

āet-ing ‘eating, pasture’ (after zero derivation *etan* ‘to eat’ > *āet* ‘food’)

Figure 4: Process feeding.

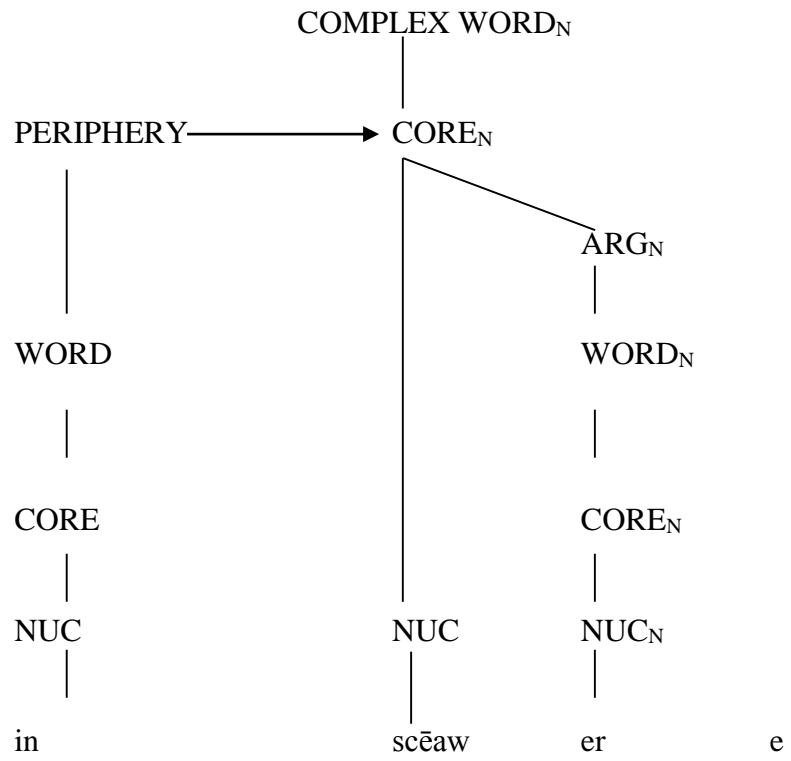


Figure 5: *Inscēawere* ‘inspector’ in the LSW.

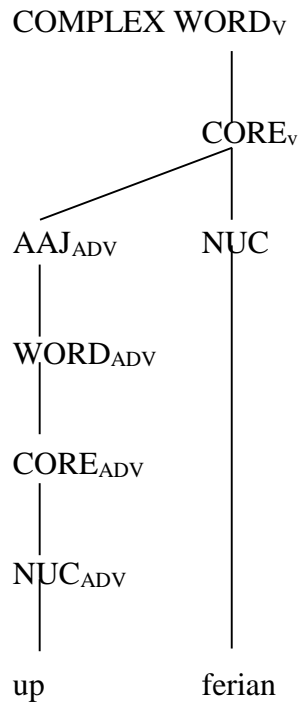


Figure 6: *Up-ferian* ‘to raise’ in the LSW.

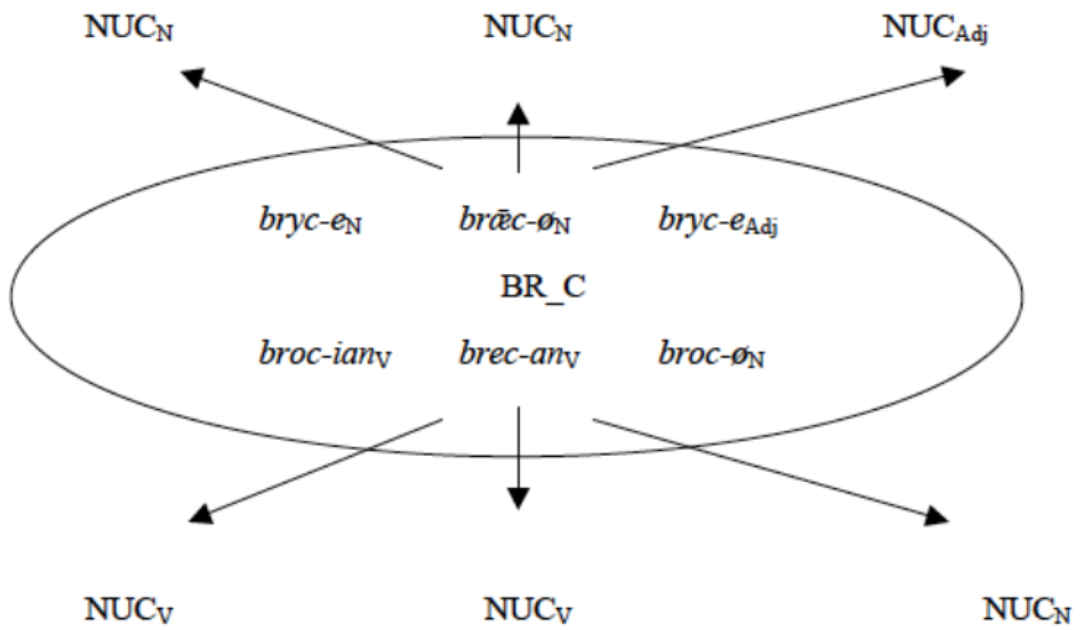


Figure 7: The NSP as applied to the paradigm of BRECAN.

[PREFIELD 3] [PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1]
 [POSTFIELD 2] [POSTFIELD 3]

Figure 8: The maximal morphological template of Old English.

[PREFIELD 1] NUCLEUS

ed-wist ‘substance’

[PREFIELD 2] [PREFIELD 1] NUCLEUS

of-ū-drincan ‘drain’

NUCLEUS [POSTFIELD 1]

arod-scipe ‘energy’

NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

ðēow-dōm-hād ‘service’

[PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

un-hīersum-līc-e ‘disobediently’

[PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1]

ūp-ū-fang-nes ‘reception’

[PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

un-ge-sib-sum-nes ‘discord’

NUCLEUS [POSTFIELD 1] [POSTFIELD 2] [POSTFIELD 3]

heals-ig-end-lic ‘imploring’

[PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2] [POSTFIELD 3]

ge-mynd-ig-lic-nes ‘remembrance’

Figure 9: The non-maximal morphological templates of Old English.

Base [affix]

un-ge-scēad-wīs-lic ‘irrational’

un [*gescēadwīslīc*]

Figure 10: Gradual template.

Figures

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$[\quad]_z$



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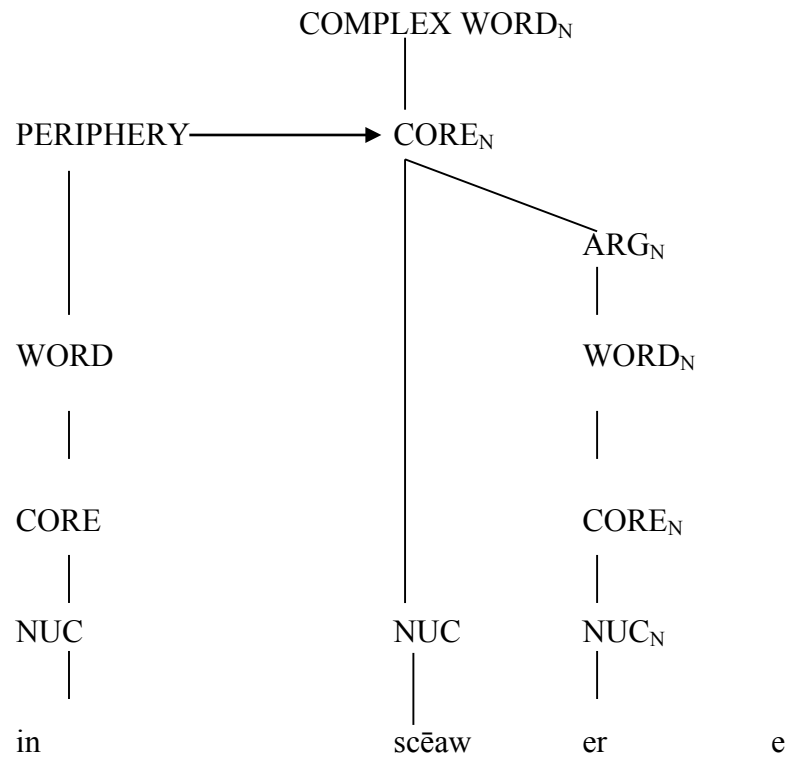


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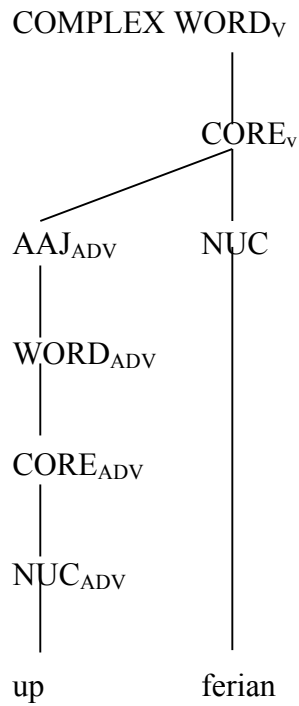


Figure 6: *Up-ferian* ‘to raise’ in the LSW.

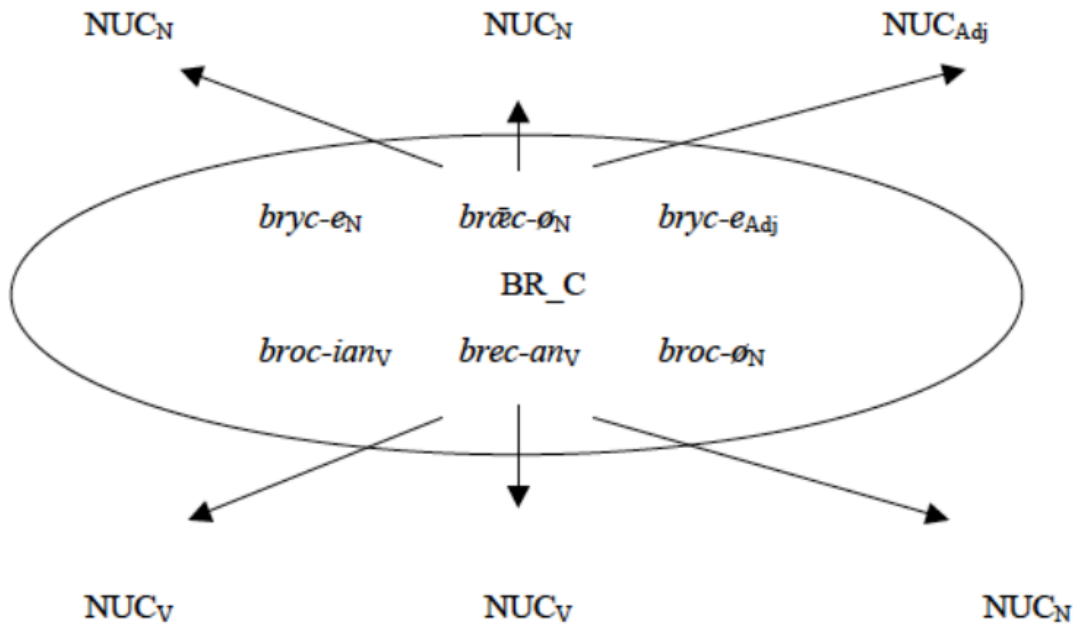


Figure 7: The NSP as applied to the paradigm of BRECAN.

[PREFIELD 3] [PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1]
 [POSTFIELD 2] [POSTFIELD 3]

Figure 8: The maximal morphological template of Old English.

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[PREFIELD 2] [PREFIELD 1] NUCLEUS

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NUCLEUS [POSTFIELD 1]

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[PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

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[PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1]

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