

# Morphological process feeding in the formation of Old English nouns<sup>1</sup>

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*The aim of this journal article is to study recursivity in terms of morphological process feeding in the formation of Old English, thus dealing with the relationship that holds among the major lexical creation processes of affixation (suffixation and prefixation), compounding and zero-derivation. The analysis is based on the ascription of each of the predicates to one of the morphological processes and the identification of the base and adjunct constituents of each complex predicate. Two main conclusions can be drawn from this research. First, that no relative ordering of processes can be established, and second, that recursive word-formation in Old English outnumbers non-recursive word-formation.*

**Keywords:** Morphology, Word Formation, Old English, Recursivity, Process Feeding

## 1. Introduction

This journal article explores the relationship between recursivity and the more general concept of morphological process feeding in the context of the formation of Old English nouns. Its aim is to provide an exhaustive description of the interaction among the word-formation processes that turn out nouns in Old English, thus contributing to the line of research in Old English word-formation opened by Kastovsky (1986, 1989, 1990, 1992, 2005, 2006), who has dealt with the question from the perspective of the typological shift from stem-formation to word-formation; and continued by Martín Arista (2008, 2009, *fc.* a, b, c, d, e), who has explained the derivational processes of Old English by means of a syntagmatic procedure of word-formation inspired by the layered representation of clause and phrase structure adopted by functional grammars (Foley and Van Valin 1984; Dik 1997a, b; Van Valin and LaPolla 1997; Van Valin 2005). Given that the word-formation morphology at this stage of the English language very often derives previously derived words, it is also an aim of this work to contribute to the debate over recursivity in morphology.

The research data include 16,694 nouns (type) retrieved from the lexical database of Old English *Nerthus* ([www.nerthusproject.com](http://www.nerthusproject.com)), which comprises over 30,000 words mainly from Clark Hall's (1996) *A Concise Anglo-Saxon Dictionary*, but also from Bosworth and Toller's (1973) *An Anglo-Saxon dictionary* and Sweet's (1976) *The student's dictionary of Anglo-Saxon*.

Given these aims and data, the remainder of this article is organised as follows. Section 2 raises the methodological questions involved in this research, including the concept of recursivity as well as its differences with respect to morphological process feeding. Section 3 provides an extensive account of the relations holding between the different morphological processes of noun formation in Old English. Finally, section 4 offers the main conclusions than can be drawn from this research.

## 2. The methodology of analysis of morphological process feeding

In plain terms, recursivity implies repetition. More technically, a recursive rule reduces complex instances to basic instances of a phenomenon, in such a way that the rule is applied inside the rule. Considered from the perspective of the process for which the recursive rule accounts, a process is recursive if a step of the process requires the repetition of the step in question so that the required output of the process is turned out. In linguistics, compounding illustrates the concept of recursive process neatly: by root compounding we get *medicine book* out of *medicine* and *book* and, by means of repeated application of the rule of root compounding, we get *medicine book shelf* out of *medicine book* and *shelf*. In affixation, *aware* plus *-ness* turns out *awareness*, which, by prefixation of *un-*, produces *unawareness*. This example, however simple it may look, raises a central question for the study of linguistic (including morphological) recursivity. The problem can be stated in the following terms: how restrictive must the definition of morphological process be in order to speak of recursivity properly? In other words, does *unawareness* involve some sort of recursivity? If recursivity is understood as the repetition of a rule, it is not evident that prefixation and suffixation are governed by the same rules and, therefore, *unawareness* is not recursive. In general, the studies in affix combination focus on prefixation or suffixation, with much more attention paid to the latter. Level ordering has concentrated on suffix combination. When constraints that apply to both prefixation and suffixation have been proposed, they have been formulated indirectly, as in the semantic restrictions advanced by Lieber (2004). The case with *medicine bookshelf* is different because the same rule is applied in both steps of compounding, namely root compounding.

Summarising, the distinction between recursivity and morphological process feeding lies in the manner in which the repetition of processes is understood. In other words, if the term *morphological recursivity* is used in a wide sense, then this study engages in morphological recursivity in word-formation. If morphological recursivity is considered in a narrow sense, which requires that a given process feed the same process, as in compounding feeding compounding, but not in affixation feeding compounding, then this journal article is concerned with the feeding of morphological processes of word-formation. In fact, I have opted for the more general term of *morphological process feeding* rather than *morphological recursivity* for the title of this essay, since it probably has a wider scope.

The input to processes of Old English noun formation consists of affixes, stems and words. The output (assuming the required inflection) are words. The focus will be in the interaction of processes. A restrictive approach to the question of recursivity would exclude such interaction of derivational processes, given that only successive suffixation, for instance, could be considered. On the other hand, if recursivity is accepted when it involves different specific processes -accepting that the same general process applies, that is, lexical creation- we can speak of process feeding. Process feeding is the relationship that holds between two or more specific processes of lexical creation that partake in the formation of a given complex word.

Regarding the classical distinction between Item-and-Arrangement and Item-and-Process morphology drawn by Hockett and quoted by Spencer (1991), this proposal goes in the line of the Item-and-Process approach. Whereas the Item-and-Arrangement is a top-down procedure for decomposing words into their component morphemes, the Item-and-Process approach is instead a way of relating basic to non basic forms by means of a series of processes. I have opted for a theoretical stance pointing in this direction not only because my

concern is with processes but mainly because a bottom-up dynamic procedure is consistent with the general outlook of functional grammars, which stresses the dynamic and procedural aspects of linguistic production.

Other terminological and methodological questions that deserve attention are discussed in turn.

Kastovsky (1987, 1989, 2006) and Lass (1994) stress the typological shift that takes place in Old English from variable base to invariable base formation (or from stem-formation to word-formation). Being aware of this evolution, I use word-formation as a cover term: the output of morphological processes of derivation and inflection is a word, even though the input may be a word or a stem. In this sense, the lexicon of Old English contains affixes like *a-* in *ablysung* ‘shame’, stems like *-cum-* as in *tocuman* ‘arrive’, *cuma* ‘stranger’ and *cumliðnes* ‘hospitality’ and words such as *drifan* and its derivative *adrifan* ‘drive’ and *onwegadrifan* ‘drive away’ (Martín Arista 2008).

Under the term zero-derivation, I include those predicates that are formally and semantically related to a strong verb and do not undergo any process of external derivation. I draw on Kastovsky (1968: 31), for whom this phenomenon occurs “in those cases where a certain stem is used for the formation of a categorically different word without a derivational element being added.” Whereas there is no addition of derivational morphemes, it is often the case that an alternation holds with respect to one of the reference forms of the strong verb, namely, the infinitive, preterit singular, preterit plural and the past participle. Examples in point are *sang* ‘song’ < (*ge*)*singan* ‘to sing’ (through preterit singular); and *slæ:p* 1 ‘sleep’ < (*ge*)*slæ:pan* ‘to sleep’ (through loss of inflective ending).

Focusing on derivationally explicit word-formation, the distinction between affixation and compounding poses the problem of affixoids (Kastovsky 1992), or borderline cases between these processes. They are elements that exist as independent lexemes in the lexicon of the language and are going through a process of grammaticalisation, whereby a lexical item becomes a bound form (Bauer 2007). The inventory of affixoids includes the prefixoids *æfter-* ‘after’, *be-* ‘by, near’, *fær-* ‘calamity, sudden danger, peril, sudden attack’, *for-* ‘before, from’, *fore-* ‘before’, *forð-* ‘forth, forwards’, *ful-* ‘full’, *in-* ‘in’, *of-* ‘over, above’, *ofer-* ‘over’, *on-* ‘on’, *to:-* ‘to’, *ðurh-* ‘through’, *under-* ‘under’, *up-* ‘up’, *ut-* ‘out, without’, *wan-* ‘lack of’, *wið-* ‘with, near, against’, *wiðer-* ‘against’ and *ymb-* ‘around, about’. The set of affixoids also includes the suffixoids *-bora* ‘bearer’, *-do:m* ‘doom, condition’, *-ha:d* ‘person, condition, state’, *-la:c* ‘play, sacrifice’, *-mæ:l* ‘mark, measure’, *-ræ:den* ‘terms, condition’ and *-wist* ‘being, existence’. Although the borderline between derivation and compounding is not always clear, the distinction between both processes is maintained in this analysis in order to perform the gradual study of processes and focus on the restrictions that may be imposed on the different combinatory elements. In general, the question has been set by treating affixoids as pure prefixes when the number of lexicalized derivatives is relevant.

The full inventory of the affixes identified for this research is as follows. Spelling variants are given between brackets. I draw on the convention adopted by the lexical database of Old English *Nerthus* of numbering predicates morphologically contrasting predicates that are otherwise equal.<sup>2</sup> The prefixes are *a:-* (*æ:-*), *æ:-*, *æfter-*, *and-* (*an-*, *on-*, *ond-*), *ante-*, *arce-*, *be-* (*bi-*, *bi:-*, *big-*), *ed-* (*æd-*, *et-*, *æt-*, *ead-*, *eð-*), *el-* (*æl-*, *ell-*), *fær-*, *for-* (*fore-*), *forð-*, *ful-*, *ge-*, *in-*, *med-* (*met-*), *mis-*, *of-* (*æf-*, *ef-*), *ofer-*, *on-* (*an-*), *or-*, *sa:m-*, *sam-*, *sin-1*, *sub-*, *to:-*, *ðurh-*, *un-* (*on-*), *under-*, *up-*, *ut-*, *wan-*, *wið-*, *wiðer-*, and *ymb-* (*ymbe-*). The suffixes include *-að* (*-oð* 4), *-noð*, *-uð*, *-eð*), *-bora*, *-do:m*, *-el* (*-ol*, *-ul*, *-ele*, *-la*, *-elle*, *-le*, *-l*, *-il*), *-els*, *-en* (*-n*, *-in*), *-en*, *-end*, *-ere* (*-era*), *-estre* (*-ystre*, *-istre*), *-et* (*-ett*), *-ha:d*, *-icge* (*-ecge*,

*-ige*), *-incel*, *-ing* (*-ung*), *-la:c*, *-ling* (*-lung*), *-mæ:l*, *-ness* 2 (*-nes*, *-nis*, *-nyss*, *-nys*), *-ræ:den*, *-scipe* (*-scype*), *-i* (*-ð*, *-ðo*, *-ðu*) and *-wist*. The suffixes *-a*, *-e*, *-o*, *-u* are considered exclusively inflective.<sup>3</sup>

### 3. The analysis of the feeding of morphological processes of noun formation

To carry out this research, a total of 16,694 nouns have been processed, out of the 30,170 files kept by *Nerthus* ([www.nerthusproject.com](http://www.nerthusproject.com)). Of these, 2,824 are listed as basic nouns and 13,670 as non-basic. Within the non-basic nouns, 4,084 are affixed nouns (1,025 by prefixation and 3,059 by suffixation), and 8,347 are compounds, while 1,239 nouns are created by means of zero-derivation.

This analysis is based on the morphological process that puts and end to each of the derivations under scrutiny, in such a way that it is possible to relate the derivational processes that occur terminally and non-terminally, as, for instance, in *misbyrd* ‘abortion’, a prefixal derivative of a zero derivative (*byrd* 1 ‘birth’) of the strong verb *beran* ‘bear’. The quantitative results of the study are discussed below. Throughout the discussion, the bases of derivation are provided between brackets.

The total amount of prefixed nouns is 754. The following typology can be established: prefixed nouns with underived bases (217): *incofa* ‘inner chamber’ (*cofa* ‘closet, chamber’); prefixed nouns with prefixed bases (65): *underto:dal* ‘secondary division’ (*to:da:l* ‘partition’); prefixed nouns with suffixed bases (167): *to:æty:cnes* ‘increase’ (*æty:cnes* ‘increase’); prefixed nouns with compound bases (21): *unfriðland* ‘hostile land’ (*friðland* ‘friendly territory’); prefixed nouns with zero-derived bases (275): *misbyrd* ‘abortion’ (*byrd* 1 ‘birth’); prefixed nouns with inflected bases (21): *gefri:end* ‘friends’ (*fre:ond* ‘friend’, nominative plural); prefixed nouns with hypothetical bases (33): *oferfre:cednes* ‘oppression’ (*fre:cednes*  $\emptyset$ ); and prefixed nouns with non-nominal bases (23): *ungeðwæ:re* 2 ‘disturbance’ (*(ge)ðwæ:re* ‘united’, adjective).

Suffixed nouns turn out a total of 3,059, which can be broken down as follows: suffixed nouns with underived bases (1,010): *wudere* ‘wood-man’ (*wudu* ‘wood’); suffixed nouns with prefixed bases (1,152): *unwærnes* ‘heedlessness’ (*unwær* ‘careless’); suffixed nouns with suffixed bases (368): *unnytlicnes* ‘uselessness’ (*unnytlic* ‘useless’); suffixed nouns with compound bases (143): *a:nmo:dnes* ‘unity’ (*a:nmo:d* ‘of one mind’); suffixed nouns with zero-derived bases (386): *sangestre* ‘songstress’ (*sang* ‘song’); suffixed nouns with inflected bases (187): *to:lysednes* ‘loosing’ (*to:ly:san* ‘to dissolve’, past participle); suffixed nouns with hypothetical bases (59): *geongorscipe* ‘discipleship’ (*geongor*  $\emptyset$ ); and suffixed nouns with non-nominal bases (1,952).

The total of compound nouns is 8,347, among which the following types can be distinguished: compound nouns with underived bases (3,975): *firesynn* ‘great sin’ (*synn* ‘sin’); compound nouns with prefixed bases (476): *ræ:dgeðeaht* ‘deliberation’ (*geðeaht* ‘thought’); compound nouns with suffixed bases (632): *yfeltihtend* ‘inciter to evil’ (*tihrend* ‘instigator’); compound nouns with compound bases (121): *cynehla:ford* ‘liege lord, king’ (*hla:ford* ‘lord’); compound nouns with zero-derived bases (3,034): *wudure:c* ‘smoke from a funeral pyre’ (*re:c* ‘smoke’); compound nouns with inflected bases (57): *nyðera:worpen* ‘one who has been cast down’ (*a:weorpan* ‘to throw’, past participle); compound nouns with hypothetical bases (217): *wordsomnere* ‘enumeration’ (*somnere*  $\emptyset$ ); and compound nouns with non-nominal bases (91): *na:n* 2 ‘no one, none’ (*a:n* 1 ‘one’, adjective).

Zero-derived nouns turn out a total of 1,241 instances, which belong to the following types: zero-derived nouns with underived bases (357): *wro:t* ‘snout, elephant’s trunk’ (*wro:tan* ‘to root up’); zero-derived nouns with prefixed bases (874) *u:tfaru* ‘going out’ (*u:tfaran* ‘to go out’); zero-derived nouns with suffixed bases (0); zero-derived nouns with compound bases (8): *onweggewite* ‘departure’ (*a:weggewi:tan* ‘to depart’); zero-derived nouns with zero-derived bases (0); zero-derived nouns with inflected bases (0); zero-derived nouns with hypothetical bases (2) *beho:f* ‘behoof’ (*behebban*  $\emptyset$ ); and zero-derived nouns with non-nominal bases (1,241).

These data show, to begin with, that a restrictive approach to the question of recursivity that excluded process feeding would leave aside a relevant part of analysable material. It is also worth pointing out that the complexity displayed by the combinations of processes excludes any explanation in terms of relative ordering.

By final process, some relevant data must be remarked. Prefixation is the most restricted final process in the formation of Old English nouns. Regarding the combination of prefixation with previous morphological processes, it is interesting that the combination of two prefixes as final and pre-final processes is relatively uncommon. Just 65 prefixed predicates display a prefixed base. On the other hand, the attachment of a prefix to a suffixed base is far more common in Old English than the combination of two prefixes occurring finally. Up to 167 predicates are formed by following this pattern.

The differences between pre-final prefix-final prefix and pre-final suffix-final prefix combinations also deserve some attention. In the first place, the number of final prefixes is higher when suffixation feeds prefixation than when pure recursivity (one process feeding the same morphological process) occurs. In prefixation feeding prefixation there arise 17 different final prefixes, including *æfter-*, *and-*, *for(e)-*, *in-*, *mid-*, *mis-*, *of-*, *ofer-*, *on-*, *or-*, *to:-*, *un-*, *under-*, *u:t-*, *wið-*, *wiðer-* and *ymb(e)-*, whereas there appear 26 when the feeding process is suffixation; to the above mentioned prefixes, with the exception of *æfter-* and *or-*, which do not combine with any pre-final suffix, we have to add *æ:-*, *be-*, *ed-*, *forð-*, *fram-*, *fre:a-*, *ful-*, *sam-*, *sin-*, *u:p-* and *wan-*, which can combine with suffixes, but not with prefixes. As an illustration of prefixation feeding prefixation with some of the affixes just listed, consider *misgedwield* ‘error, perversion’ (*((ge)dwild* ‘wandering; error’), which displays pre-final prefixation, and *ymbfæstnes* ‘enclosure’ (*fæstnes* ‘firmness; stronghold’), which shows pre-final suffixation.

The largest group of prefixed predicates is that consisting of a prefix plus a zero-derived predicate, as is the case with *ungifu* ‘evil gift’ (*giefu* ‘giving, gift’), a zero-derivative of *giefan* ‘give’. A total of 275 nouns are made in this way, thus representing 34% of the total of prefixed nouns.

Considering suffixation, all the morphological processes can take part in steps previous to the formation of nouns by suffixation as in *bepæ:c-estre* ‘whore’ (*bepæ:can* ‘to deceive, seduce’), although not all suffixed nouns contain a pre-final derivational process. In fact, of the total 3,059 suffixed nouns, up to 1,010 nouns result from the attachment of a suffix to an underived base.

As for pre-final prefixation, 1,152 suffixed nouns take a prefixed base. Of these, 132 are nouns, 172 are adjectives, 3 are adverbs and 845 are verbs. The low number of nominal bases is predictable, since suffixes very often change the category of the base of derivation as in *ðe:ostrung* ‘twilight, gloom’ whose base is the adjective *ðe:ostor* ‘dark, gloomy’ or in *spendung* ‘spending’ from the verb *spendan* ‘to spend’.

Turning to affixal distribution, the most frequent suffixes occupying the final position of the derivational processes are *-nes* and *-ing* (with its variant spelling *-ung*). Such frequency includes not only to the number of prefixes they combine with (type), but also to the total number of nouns suffixed with *-ness* or *-ing/-ung* which present pre-final prefixation (token). In the case of *ing/ung*, the suffix combines with a total of 27 prefixes, including *a:-*, *æfter-*, *æt-*, *and-*, *be-*, *ed-*, *el-*, *for(e)-*, *forð-*, *ge-*, *in-*, *mis-*, *o:-*, *of-*, *ofer-*, *on-*, *or-*, *oð-*, *to:-*, *ðurh-*, *un-  
under-*, *u:p-*, *wan-*, *wið-*, *wiðer-* and *ymb-*, which turn out a total of 413 predicates. *a:-* in *a:fandung* ‘trial, experience’; *ed-* in *edlæ:cung* ‘repetition’; *of-* in *ofsetzung* ‘pressure’; *ofer-* in *oferheling* ‘covering’; *ðurh-* in *ðurhlo:cung* ‘preface, introduction’; *wið-* in *wiðsacung* ‘denial, renunciation’; *ymb(e)-* in *ymbwla:tung* ‘contemplation’, etc.

The combination of two prefixes or two suffixes is not so frequent as the one of a prefix and a suffix. 368 suffixed predicates only have a suffixed base. Yet, the combination of two suffixes is considerably more frequent than the one of two prefixes as final and pre-final derivational elements.

Suffixed nouns present compound bases in 143 instances, that is, the percentage of compound bases that feed suffixation equals that of the compound bases feeding prefixation. In both cases the predicates thus formed represent 3% of the total prefixed and suffixed nouns. Around 10% (386 in absolute terms) of the suffixed predicates are formed from zero-derived bases. I have also proposed 59 hypothetical bases for the suffixed predicate, which represent 1.92 % of the total 3,059 suffixed predicates. There is a relevant number of suffixed nouns that present non-nominal bases. Up to 1,952 of them take a non-nominal base, including 1,134 verbs, 802 adjectives, 12 adverbs, 2 numerals, 1 pronoun and 1 adposition.

Considering compounds, which constitute the largest group of complex nouns, the impact of pre-final derivational processes upon them is not very relevant if we disregard the participation of zero-derived constituents. The vast majority of compound constituents are basic predicates. Second in importance are the zero-derived predicates. They appear as part of the compound nouns in 27% of the cases. Pre-final affixal derivation occurs in just 11% of compounds. In 1,011 cases the constituent takes a postfield bound morpheme, while prefixation appears in just 873 compound predicates. Pure recursivity is also found in compounds, but only in a marginal 2% of the nouns analysed.

Compounds, being formed by two lexical items, can be classified on the grounds of the base (rightmost element) or the adjunct (leftmost element). Although all the derivational processes can occur pre-finally in either constituent, some tendencies can be put identified. Firstly, most of the basic predicates partaking in compounds occupy the adjunct position. Thus, complex constituents are generally placed to the right of the compound formation. With the exception of compound constituents, which are equally used as bases or adjuncts, and inflected items, which usually occupy the adjunct position, complex constituents appear as bases in a 2:1 ratio with respect to those in adjunct position.

Regarding particular derivational phenomena, prefixation is the pre-terminal derivational process in 476 bases of compounds and in 397 adjuncts. The most striking characteristic of base constituents is that prefixation nearly always involves the prefix *ge-*. Suffixation appears as the most frequent pre-terminal process when analysing nominal compounding in Old English, with 1,011 predicates being formed by at least one suffixed constituent. In 632 cases, the compound noun has a suffixed base whereas the leftmost constituent is suffixed in 379 cases.

The most relevant derivational process taking part in compound nouns is zero-derivation. The nominal predicates derived from strong verbs by means of a zero morph show

up in 3,034 compounds as base, and in 1,845 other cases as adjunct. Whereas in the other derivational processes discussed above the presence of zero-derivation as the pre-terminal feeding process was not particularly relevant, in the case of compounding it has a great importance. The study of the zero-derived nouns shows that these predicates are formed only from basic, prefixed and compound inputs. Neither suffixation nor zero-derivation takes part in this process of word-formation. As regards suffixation, the only suffixed verb is *wæcnan* ‘to come into being, awake, come forth, spring from, arise, be born’, which does not yield any zero-derived predicate.

As was the case with prefixation and suffixation, the identification of the bases of compound nouns has not been possible for some instances. For 217 predicates a hypothetical form has been proposed as base. With respect to the adjuncts, a total of 164 hypothetical forms have been put forward. In general terms, 381 out of the total 16,694 constituents of compounds are hypothetical. The figure represents just 2.28%, of the total, which is in accordance with the average 3% of hypothetical forms that has been required in the study of the prefixation and suffixation derivational processes.

As compounding is a more restricted phenomenon in verb formation than prefixation, it is not surprising that the number of zero-derived nouns from compound verbs is smaller than that of those formed from prefixed verbs. There are only 60 compound strong verbs, which produce these zero-derived predicates: *a:ðswaru* ‘oath-swearing, oath’ (*a:ðswerian*), *a:ðswara* ‘oath-swearing, oath’ (*a:ðswerian*), *eftæ:rist* ‘resurrection’ (*efta:ri:san* ‘to rise again’), *onweggewite* ‘departure’ (*a:weggewi:tan* ‘to depart’), *niðerstige* ‘descent’ (*niðersti:gan* ‘to descend’), *ny:dnima* ‘one who takes by force’ (*ny:dniman*) and *ny:dnimu* ‘rapine, forcible seizure’ (*ny:dniman*).

Although, in general, the identification of the base is more straightforward in the case of zero-derivation than in other derivational processes, still, two words resist base identification. These predicates are *beho:f* ‘behoof’ (*behebban*  $\emptyset$ ) and *ofæ:te* ‘food’ (*ofetan*  $\emptyset$ ). As the total number of zero-derived predicates rises to 1,241, the predicates for which a hypothetical base has been put forward represent 0.16% only.

Once the complex nouns have been separated from the simplex ones, and after ascribing them to one of the derivational processes present in Old English, the analysis has engaged in the identification of the bases of derivation and the adjuncts (leftmost element) of compounding. The number of hypothetical (reconstructed) bases of derivation has been kept to a minimum, although a reasonable number has been proposed in order to guarantee the successive occurrence of morphological processes. I have been able to identify a total of 4,362 bases of derivation, which give rise to the total 13,670 complex nouns analysed and 1,840 different adjuncts, which partake in the formation of the 8,347 compound nouns that have been analysed. The categories involved are shown in Table 1.

	Noun	Verb	Adjective	Adverb	Minor Categories	Hypothetical	Total
<b>Bases</b>	2,279	1,138	666	15	4	260	4,362
<b>Adjuncts</b>	1,436	20	189	53	17	125	1,840

Table 1 *Recursive noun-formation by category*

As can be seen in table 1, nearly 1/2 of the complex nouns of Old English have a nominal base. When we consider the adjuncts of compounding, the figure of nominal constituents

increases to 2/3 of the total. Second in importance comes the category verb. In general, suffixation is the process responsible for the central role that verbs play in the formation of complex nouns. Something similar happens to the category adjective. Finally, 260 hypothetical forms have been put forward, which represents, in relative terms, 5.96% of the bases and 6.79% of the adjuncts.

The data displayed by table 1 make reference to the unidirectional bases and adjuncts (in the sense that word-formation processes are described in such a way that a single base of derivation is isolated), while the distribution of the category of the bases by final process and token is offered in Table 2.

	<b>Noun</b>	<b>Verb</b>	<b>Adjective</b>	<b>Adverb</b>	<b>Minor Categories</b>	<b>Hypothetical</b>
<b>Prefixation</b>	731	8	15			33
<b>Suffixation</b>	1,107	1,134	802	12	4	59
<b>Compounding</b>	8,256	57	30	4		381

*Table 2 The category of the bases of complex nouns*

By process, the influence of simplex nouns in the formation of more complex nouns is profound in prefixation and compounding. In both cases, non-nominal bases play a marginal role in the construction of further lexemes. However, while in prefixation adjectival bases are preferred to verbal ones, compounds present a wider range of verbal bases if compared with the presence of adjectives in the rightmost position of compounds. In suffixation, on the other hand, the use of non-nominal forms outnumbers the choice of already existing nouns as bases. It is not only that verbal bases are more common than noun bases, but also that the figure of adjectival bases is not significantly lower than that of nouns.

Table 3 accounts for the combination of the derivational processes in the final and pre-final stages. Underived pre-final bases are also included.

<b>PRE-FINAL</b>	<b>FINAL Prefixation</b>	<b>Suffixation</b>	<b>Compounding</b>	<b>Zero-derivation</b>
	<b>Adjunct/Head</b>			
<b>Basic</b>	217	1,010	5,468 / 3,976	357
<b>Prefixation</b>	65	1,152	398 / 476	874
<b>Suffixation</b>	167	368	379 / 632	
<b>Compounding</b>	21	143	122 / 121	8
<b>Zero-derivation</b>	275	386	1,845 / 3,034	

*Table 3 Process feeding in Old English complex nouns*

The analysis of process feeding from the perspective of the pre-terminal process determines the influence of each phenomenon on subsequent formations. An overview of the data is presented in Table 4.



<b>Pre-terminal Process</b>	<b>Occurrences</b>
<b>Prefixation</b>	2,564
<b>Suffixation</b>	1,554
<b>Compounding</b>	407
<b>Zero-derivation</b>	5,180

Table 4 *Pre-terminal process and recursivity*

A direct conclusion of the comparison of the final and pre-final processes is that the more restricted the pre-terminal use of a process is, the more frequent it turns out in final derivation and viceversa. Consider, as illustration, the data in Figure 1, which ranks the different derivational processes on the grounds of their use in pre-final and final stages.

<b>Pre-Final</b>	<b>Final</b>
Zero-derivation	Compounding
Prefixation	Suffixation
Suffixation	Zero-derivation
Compounding	Prefixation

Figure 1 *The ranking of processes*

Compounding, which is by far the most productive process in lexical creation, provides little ground for other process to interact and operate from compound forms. On the other hand, prefixation, which is the most restricted final derivational process appears as a very resourceful feeding process, and is second only to zero-derivation. Suffixation, which outnumbers prefixation in a 3:1 ratio when these processes are final, is outnumbered by 1,010 predicates with respect to prefixation, when considering both process pre-terminally.

#### **4. Conclusions**

The quantitative data discussed so far account for the combination of the final (terminal) and pre-final (pre-terminal) morphological processes. This two-level analysis allows me to reach the following conclusions.

In the first place, I concur with Martín Arista (2008) in that there is no relative ordering of processes of word-formation in Old English. The inclusion of zero-derivation into the analysis, far from allowing for the definition of a relative order of morphological processes, clearly disfavours such an analysis. Contrary to any predictions in the sense that affixation may take place before compounding (prefixation occurring before suffixation), and inflection may turn out as the final step, this study has come across numerous combinations in which this relative ordering is not kept, thus identifying, for example, instances of suffixation feeding prefixation, or inflection occurring before suffixation, among other relevant possibilities.

A second conclusion derived from this analysis is that the combination of derivational processes is very frequent at this stage of the language. Table 5 accounts for recursive and non-recursive prefixation, suffixation and compounding.

	<b>Non-recursive</b>	<b>Recursive</b>
<b>Prefixation</b>	217	548
<b>Suffixation</b>	1,010	2,059
<b>Compounding</b>	2,503	5,844
<b>Total</b>	3,720	7,951

Table 5 *Recursive and non-recursive word-formation*

As shown in Table 5, recursive word-formation outnumbers non-recursive word-formation. As regards affixation, 548 of the 754 prefixed nouns analysed in this work include some degree of recursivity, that is, or lexical reuse (72.7%). A similar picture can be observed in suffixation, where 67% of the suffixed predicates show some kind of recursivity. Recursivity operates in a similar fashion in processes other than affixation, and 73.3 % of compound nouns display process repetition. As compounds admit analysis in both their adjuncts and bases, Table 6 quantifies the different possibilities of recursive compounding (underived adjunct + non-basic base; non-basic adjunct + underived base and non-basic adjunct + non-basic base).

	<b>Basic/Non-Basic</b>	<b>Non-Basic/Basic</b>	<b>Non-Basic/Non-Basic</b>
<b>Compounding</b>	2,850	1,473	1,521

Table 6 *Recursive compounding*.

Last but not least, the exhaustiveness of the data presented proves the database *Nerthus* a valuable tool for the carrying out morphological and lexicological research in Old English.

## Notes

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<sup>2</sup> See González Torres (2009) for a full description of the adjuncts of derivation.

<sup>3</sup> But see González Torres (2009) for a treatment of these suffixes at the boundary between derivation and inflection.

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