

UNIFICATION AND SEPARATION IN A FUNCTIONAL THEORY OF MORPHOLOGY

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Abstract: This paper offers the initial design for a functional theory of morphology and addresses the question of how much unification or separation of domains and units is required in such a theory. Given that morphology is largely driven by principles that also rule syntax and semantics, the main thrust of this proposal is that the interaction between morphology and other areas of the theory can be adequately accounted for by the combination of three descriptive-explanatory resources: layered structures, templates and constructions. Other descriptive-explanatory principles such as feature perlocation and the characteristics of bases and adjuncts remain specifically morphological. Unification and separation in morphology must be carried out on functional grounds. Moreover, Old English evidence shows that no strict separation can be postulated, either between morphology and the rest of the theory or among the different morphological processes.

Running head: Unification and separation in functional morphology

Unification and separation in a functional theory of morphology

1. Introduction

This paper contributes to the debate over the nature and mechanisms of morphology that is currently going on in the functional school in general (Dik 1997a, b; Van Valin and LaPolla 1997, Van Valin 2005) and in Role and Reference Grammar (henceforth RRG) in particular, firstly by taking issue with the external motivation of morphology and secondly by addressing the crucial question of how much unification or separation of domains and units is required in functional morphology.¹

This paper is organised as follows: in section 2, I review previous work in RRG morphology and focus on the lexicon; in section 3, I engage with the problem of the unification vs. separation of domains and units; in section 4, I advance a proposal for the principles and rules that govern the insertion of elements into the slots of morphological templates; and, by way of conclusion, I summarise the main contributions and make some suggestions regarding possible future work along the research lines opened up by this paper.

The language of analysis is Old English (henceforth OE), given its morphological richness: indeed, it displays full inflections and is endowed with numerous morphologically-related word families, as well as a fair degree of transparency in derivation (Kastovsky 1992). The data upon which the proposal for an OE morphological template rests have been retrieved from *Nerthusv4* (Martín Arista *et al.*), a database of OE lexical derivation that contains ca. 30,000 entries.

2. Morphology and the functional lexicon

Mairal--Cortés (2000-2001) have made two significant claims concerning the nature of a functional lexicon and the relationship between morphology and other components of the theory, while Everett (2002) has advanced a number of guidelines that may lay the foundations of a theory of morphology for RRG. In this section, I elaborate on Mairal--Cortés's parallel architecture of the lexicon and explore the implications and consequences of Everett's guidelines.

Some generative theories of language, both of a formalist and a functionalist persuasion, maintain that the rules of word-formation are the same as those of phrase and clause formation. Baker (1988) and Lieber (1992) on the one hand, and Dik (1997a) on the other, represent this theoretical stance in the transformationalist and the functionalist school, respectively.² These views must be considered in the wider context of the two extreme positions regarding the existence of morphology and its relations with other areas of grammar: the lexicalist position, which denies interaction between morphology and syntax, but admits the existence of morphology; and the syntacticist position, which denies the existence of morphology while reducing all morphological phenomena to syntactic operations. I review these questions in turn.

As for the existence of morphology, I concur with authors such as John Anderson (1992) or Baker (2003), who consider that morphology exists if, in spite of the interaction between word and sentence structure, some principles remain specifically morphological. In Baker's (2003: 280) words, "once the syntactically predictable morphology has been stripped away, there remains a residue of morphology that seems to have nothing to do with syntax". Baker mentions non-productive derivation and

language-specific aspects of inflection. In this paper, I add feature perlocation and the morphological properties of bases to this list. If morphology cannot be entirely reduced to syntax, it follows that a functional theory of language must allow in a certain amount of morphology, but the question which remains is whether it is independent from other areas of grammar. The lexicalist claim that morphology is completely independent from syntax must be interpreted in the general context of a modular theory of language, that is, a theory that postulates the existence of different components or modules, in such a way that the output from the lower component constitutes the input to the higher component in the derivation of multistratal theories, such as transformational grammar, or in the expansion of monostratal theories like Functional Grammar.³ In this respect, I follow Van Valin--LaPolla (1997) in making no claim for modularity and, consequently, admitting no interfaces. In a theory without modules and interfaces, parts of the theory interact with one another in a pervasive way. In this proposal, trees, templates and constructions account for certain aspects of this interaction.

The next step is to decide where morphology should be placed. There has been a long debate over the question of the independence of morphology. Although the discussion was very much theory-driven and largely reflected the shifts of thought in the transformationalist school, it will not be out of place here to summarise the extreme positions taken on this issue. To the extent to which Chomsky's work may represent the transformationalist enterprise, we may say that the views of this author have evolved from the absolute dependence of morphology on syntax to the absolute independence of morphology from syntax. Early transformationalism (Chomsky 1957) stands out as one pole in this respect: syntactic transformations did not leave any room for morphology, given that structure-changing operations also created units smaller than a phrase. The first revision of this position was carried out in Chomsky (1970), where it was questioned whether syntax could manipulate units smaller than a sentence. Chomsky (1995) represents the opposite stand from the 1957 position: there is no interaction between the formation of words and the formation of phrases because the lexicon produces full words - including derivational and inflectional morphology - that enter the syntactic derivation.⁴ The position that I adopt in this respect, following Mairal--Cortés (2000-2001) and Everett (2002), is that morphology is the product of the interaction between the lexicon on the one hand and pragmatics, semantics and syntax on the other. In line with Dik (1997a), I define the lexicon as the inventory of predicates and the rules that derive non-basic predicates from basic predicates. This definition calls for further explanation in the context of this proposal:

1. Categories are functional labels. I use categorial labels because categorial information plays a major role in derivational morphology. Moreover, of the four major lexical categories, at least nouns and verbs are universal. I subscribe to the RRG view that the function of categories in discourse has explanatory status. Categories fall into two types: lexical categories and grammatical categories. Lexical categories combine with other lexical categories, that is to say, they exhibit relations of complementation. Grammatical categories, on the other hand, distribute across one another and across lexical categories to form paradigms.⁵ Putting aside adpositions and adverbs, a functional definition of the major lexical categories must stress their behaviour and go along the following lines: the major lexical category to which potentially referential predicates belong is the Noun; the major lexical category to which predicates that express quality or relation belong is the Adjective; and the major lexical category to which predicates that express state or process (including activity, achievement and accomplishment) belong is the Verb.⁶

2. The lexicon is productive. Zwicky's (1992: 331) words, "one of the major choices available for a theory of morphology is to opt for a full and redundant lexicon, so that

morphological rules describe what is predictable, or for a minimal, redundancy-free lexicon, so that morphological rules supply what is predictable". In the framework to which this discussion contributes, lexical productivity is motivated externally: pragmatics, semantics and syntax partially govern word-formation.

3. The entries of the lexicon are lexemes. Lexemes are free or bound. Free lexemes belong to the major lexical categories. Bound lexemes are affixes that take part in derivational processes. Fully-specified lexemes constitute predicates. Predicates display, at least, the following information: categorial and combinatorial properties, the different forms, the features that motivate such forms, the stems, and the phonological representations. Morphemes are available for insertion as operators into phrases or clauses and their final form is stated by constructive templates. No distinction is drawn, therefore, between free lexemes and derivational affixes since both have complementation properties. The main distinction is that between lexemes, which have the property of complementation, and morphemes, which possess the property of distribution.

4. Derivational affixes are lexemes. As for the question of the status of affixes, there is no agreement in the literature, which is predictable, given that the choice of units has far-reaching methodological implications as well as generalised theoretical consequences. Lieber (1992), for example, argues that affixes are lexemes, whereas Beard (1995) denies them lexical status and identifies them with grammatical categories. In the functionalist camp, Mairal--Cortés (2000-2001), following the path of Dik (1997a: 54), who claims that "all lexical items of a language are analysed as predicates", have put forward a parallel architecture for primitive and derived lexical items. The parallelism basically involves the claim that affixes are listed in the lexicon along with basic predicates and are provided with categorial and combinatorial information.⁷

Everett (2002) offers a blueprint of a morphological theory for RRG in a proposal that can be summarised as follows:

1. RRG morphology is inferential realizational: rules specify the pronunciation of words, which are stems plus features.
2. The maximal unit of morphology is the Word.
3. There are no derivations.
4. Word structure can be shaped or manipulated by syntax, semantics and/or pragmatics.
5. The basic theoretical parallel established is between the Layered Structure of the Clause and the Layered Structure of the Word.
6. Derivation involves the combination of nuclei whereas inflection is the result of adding arguments to a nucleus.
7. Lexical integrity holds as regards derivation: syntax cannot see into the core of the Word.

These guidelines contain certain overt theoretical choices and imply a number of tacit assumptions that deserve some comment. To begin with, the domain of morphology is the word.⁸ This is not very far from classical proposals like Halle's (1973) or Aronoff's (1976), except that, in line with Halle (1973) and unlike Aronoff (1976), stems, instead of words, are the base of morphological processes. More recent transformational analyses, like Zwicky's (1986), also rely on the word, whereas others, such as DiSciullo and Williams (1987) and Beard (1995), opt for the morpheme. This theoretical choice of unit has a number of implications that constitute the hard core of any morphological theory. Indeed, much of the discussion on morphology in the last thirty years has revolved around this question.⁹ To continue with Everett's (2002) guidelines, there are no derivations: no filters, as in Halle (1973), no levels, as in Siegel (1979), and no strata

and no cyclicity, as in Kiparsky (1985). In the third place, stating that Word structure can be manipulated by syntax, semantics and/or pragmatics is in accordance with the organization of the theory of RRG, but it entails the separation of derivation and inflection: syntax, semantics and pragmatics cannot see into the internal structure of words, but they do see inside the external structure of words. This follows in the track of split morphology (Stephen Anderson 1992). In the fourth place, to generalise the Layered Structure of the Clause to the Word is in accordance with the linguistic tradition that for a long time has recognised interaction between morphology and syntax; and, no less importantly, it seems a logical step considering that RRG has generalised the Layered Structure of the Clause to the phrase.

3. *Unification vs. separation: lexical integrity in OE*

Summarising the previous section, we see that Mairal--Cortés (2000-2001) and Everett (2002) coincide in uniting derivational affixes and free lexemes for functional reasons. Everett (2002) unifies inflection and derivation on functional grounds since both contribute meaning to the word, while separating them on a structural basis, given that inflection is the combination of stems and features and derivation the combination of stems. In this section I further explore the question of unification vs. separation of units and domains in the light of OE data, which challenge the hypothesis of lexical integrity, whether it is understood as visibility or as relative ordering.

For several decades, the heart of the morphological discussion in the transformationalist tradition has been what the status of morphology is and, as a result, what sort of interaction is allowed between morphology and other components or subcomponents of the grammar. To quote just two opposite proposals, Di Sciullo and Williams (1987) deny any type of interaction between morphology and syntax whereas Zwicky (1986) allows for a considerable degree of interaction, for which the interface is responsible. This debate is a consequence of the central tenet of transformationalist morphology, namely that lexical integrity should guarantee that the rules of syntax do not make reference to morphology. In other words, lexical integrity is the morphological counterpart of the principle of the autonomy of syntax, which prevents syntactic rules from making reference to non-syntactic information.¹⁰

OE resists any ordering of the morphological processes of inflection, affixation and compounding with respect to one another; and, however restrictedly, lets semantics and pragmatics see into word-formation.¹¹ In brief, OE does not conform to lexical integrity. Considering the relative ordering of morphological processes, the preliminary question arises of whether derivation (in a general sense, including compounding) is recursive or not. Lexical derivation is recursive in OE and, therefore, lexical integrity cannot be considered a kind of constraint on recursivity. In other words, derivation feeds derivation and compounding feeds compounding, as can be seen, respectively, in examples (1.a) and (1.b):

- (1) a. *hreow* 'sorrow': *hreowan* 'make sorry': *ofhreowan* 'cause or feel pity'
b. *here-path* 'road': *ceaster-here-path* 'high road'

Lexical integrity does not follow from the relative ordering of morphological processes: inflection feeds derivation, as in (2.a); inflection feeds compounding, as in (2.b); affixation feeds compounding, as in (2.c); and compounding feeds affixation, as in (2.d).

- (2) a. *drincan* 'drink' (past participle *druncen*): *ofer-drincan* 'get drunk': *ofer-drunc-en* 'drunkenness': *ofer-drunc-en-nes* 'drunkenness'
- b. *drincan* 'drink': *druncen* 'drunkenness': *druncmennen* 'drunken maidservant'
- c. *gereordung* 'meal': *æfen-gereordung* 'supper'
- d. *hearm* 'evil': *hearmcweðan* 'speak evil of': *hearmcwiðol* 'evil-speaking': *hearmcwiðolian* 'speak evil of'

To these examples, the most frequent situation of compounding and derivation feeding inflection could be added. It should be borne in mind, however, that morphologically unmarked forms like nominatives and infinitives also carry inflection. I am taking the line that these forms are productively generated before derivation. If the opposite line is taken that these forms are fossilised and ready as such for derivation, the argument does not hold as regards inflection feeding derivation and compounding. But even if this were the case, derivation and compounding would still interact in very complex ways and it would not be possible to establish a relative ordering of morphological processes that justified lexical integrity in the light of OE data.

So far, lexical integrity has been discarded, at least for OE, either as a constraint on recursivity or as relative ordering. When we turn to integrity as visibility, Everett (2002) states that syntax, semantics and pragmatics have access to inflection in RRG morphology. As an illustration of this point, suffice it to say that in OE, certain verbs that take a genitive or a dative object in the active construction, such as *helpan* 'help', preserve the oblique case in the passive construction. In (3.a) the dative marking of the second argument of the active construction has been kept in the passive; and in (3.b) the genitive has been kept in the passive:

- (3) a. <Paris Ps.9.18> (van Kemenade 1997: 335)
 ...ðæt eallum folce sy gedemed beforan ðe
 ...that all people DAT be judged before you
 '...that all the people be judged before you'
- b. <Bo. 67.11> (Denison 1993: 104)
 Forðæm se ðe his ær tide ne tiolað,
 for that cause he who him GEN before time does not provide
 ðonne bið his on tid untilað
 then is he GEN in time unprovided
 'Whoever does not provide himself beforehand will be unprovided when the time comes'

As a tentative argument in favour of semantics seeing into derivation, we may take the phenomenon of negation. Given that OE allows double negation, both syntactic and lexical, one might hold that the logic of negation is attracted from Clause level to Word level in expressions like:

- (4) <Exodus, 34.10> (Haeberli--Haegeman 1999: 105)
 Ic wyrce ða tacnu ðe næfre nan man ne geseah ær on nanum lande
 I do the miracles that never no man not saw before in no land
 'I will do miracles that no man has ever seen before in any land'

It could be the case that the internal structure of the word attracts negation if the word is under the scope of negation, irrespective of the domain of negation (predicate-clause-sentence). As regards pragmatics seeing into derivation, the existence of morphological diminutives might be an argument in favour of this claim. Some OE morphological diminutives with the suffix *-inzel* are given in (5):

- (5) a. *bog* 'bough': *boginzel* 'small bough'
 b. *cofa* 'chamber': *cofinzel* 'little chamber'
 c. *lið* 'joint': *liðinzel* 'little joint'

Although it must be admitted that the empirical evidence provided against lexical integrity as a restriction on recursivity and as relative ordering is more compelling than the data challenging lexical integrity as visibility, I hope to have shown that no strict separation can be postulated in OE, either between morphology and the rest of the theory or among the different morphological processes.

4. Layered structures, templates and constructions in functional morphology

In this section I propose an initial design for a functional theory of morphology. The main thrust of this proposal is that the interaction between morphology and other areas of the theory can be adequately accounted for by the combination of three descriptive-explanatory resources: layered structures, templates and constructions. This proposal draws on the structural-functional tradition of linguistics (Dik 1997a, b; Van Valin--LaPolla 1997; Van Valin 2005); the Layered Structure of the Clause (Foley--Van Valin 1984, Hengeveld 1989, Rijkhoff 2002); the tradition of Word Syntax (Marchand 1969, Selkirk 1982, Sproat 1985, Baker 1988, 2003; Lieber 1992, 2004); and functional morphology (Dik 1997a,b; Mairal--Cortés 2000-2001, Everett 2002, Cortés forthcoming).

In the first part of this section I address two preliminary questions: the inventory of morphological processes and the features that perlocate in such processes.¹² So far, I have included compounding within morphological processes, along with affixation and inflection. At this point I should like to introduce a word of caution. In the first place, OE makes use of other processes of word-formation: zero derivation and category extension are recurrent in OE. These two phenomena are illustrated in turn in (6.a) and (6.b):

- (6) a. *riht* 'right': *riht* 'what is right'
 b. *acan* 'ake': *ece* 'pain' (Kastovsky 1968)

And, secondly, the inclusion of productive compounding within morphology increases the interaction of morphology and syntax. Apart from this theoretical reason, there is abundant empirical evidence of category change in OE, of which (7) is representative:

- (7) a. *adloma* 'one crippled by fire' (noun + adjective)
 b. *ælmyrca* 'one entirely black, Ethiopian' (adjective + adjective)
 c. *ætfeŋg* 'attaching' (adposition + verb)

Example (8) demonstrates that category is a morphological feature that must be projected (up a branch of the tree) or that must perlocate (move from one branch to another) in order to keep this relevant information throughout the representation. The

other morphological feature that can perlocate is gender. Indeed, in (8), the gender of the compound does not coincide with the gender of the base (rightmost element), as is predictable in a prefield language like OE:

- (8) a. *alorrind* ‘alder-bark’ (masculine, from feminine base and masculine adjunct)
b. *æfengereord* ‘evening meal’ (neuter, from feminine base and neuter adjunct)
c. *boldgetimbru* ‘houses’ (neuter, from neuter adjunct and feminine base)

The fundamental theoretical consequence of the empirical data contained in examples (7) and (8) is that the relevant morphological information is not always provided by the rightmost element of the compound. On the contrary, the adjunct of compounds can contribute the feature of category of gender. This situation requires that gender features are allowed to perlocate.

Along with the perlocation of features, a morphological theory allowing interaction of morphology with other areas of the theory requires word functions. As in previous work in RRG morphology, this section analyses the Complex Word as a structure containing elements and relations and generalises the Layered Structure of the Sentence to Word structure through Phrase structure. On the other hand, there are three substantial differences with respect to Mairal-Cortés and Everett: first, Mairal--Cortés (2000-2001) and Cortés (forthcoming) draw on Marchand (1969) as regards the inventory of word functions: determinant and determinatum. This inventory is not distinctive enough and, moreover, does not allow direct interaction with syntax and semantics. Therefore, I adopt the inventory of Van Valin--LaPolla (1997). Second, Everett (2002) places inflection in the Periphery of the Word. As I see it, the existence of segments that perform both an inflective and a derivative function probably conspires against the concept of peripheral inflection. Additionally, I opt for the general organization of the Layered Structure of the Clause, in which inflection is accounted for in terms of operators attached to different layers of the Clause, the Phrase and the Word. And third, Mairal--Cortés (2000-2001) and Everett (2002) explain derivation (affixation and compounding) as a combination of nuclei. I introduce the layer of the Complex Word containing the layer of the Word, with free and bound lexemes in semantically and syntactically motivated structures. As a consequence of these differences, morphological nexus and juncture varies with respect to previous work, particularly Mairal--Cortés (2000-2001).

To give the overall picture, the semantic domains of the Word include the Nucleus, the Core, the Word and the Complex Word. Structurally speaking, the node Word dominates the nodes Core and Nucleus. The node Word directly dominates the node Core and the node Core, in turn, directly dominates the node Nucleus. Semantic domains have a layered structure in such a way that outer layers include the inner ones. Each layer has its own operators, scope over outer layers implying scope over the inner layers. Figure 1 represents the Layered Structure of the Word as applied to a predicate of the category alpha:

Figure 1: The Layered Structure of the Word

Lexical constituents take up functional positions in the constituent projection of the Word. Lexical arguments perform semantically-motivated syntactic functions like Argument, Argument-Adjunct and Periphery, as is shown by figures 2 to 5:¹³

*Figure 2: First Argument in Complex Word Core: **bocere** 'writer'*

Figure 3: First and Second Argument in Complex Word Core: **bellringestre** 'bell ringer'

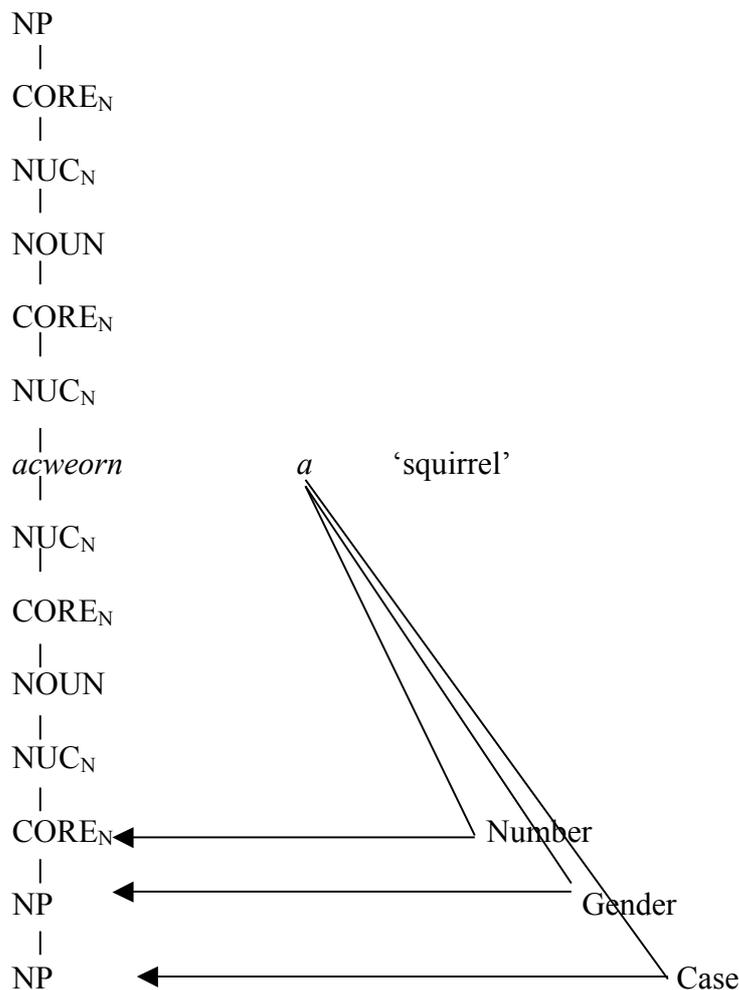
Figure 4: Argument-Adjunct in Complex Word Core: **upastigan** 'go up'

Figure 5: Periphery and Core of Complex Word: **inwritere** 'inner secretary'

Although the insertion of Word arguments is ultimately governed by semantic-syntactic rules, like the insertion of Phrase and Clause arguments, there is a fundamental difference between lexical and semantic arguments. Whereas the linking of semantic arguments in the Phrase and the Clause is direct, the linking of lexical arguments in the Word is indirect, via Phrase linking (Mairal--Cortés 2000-2001: 287-289).

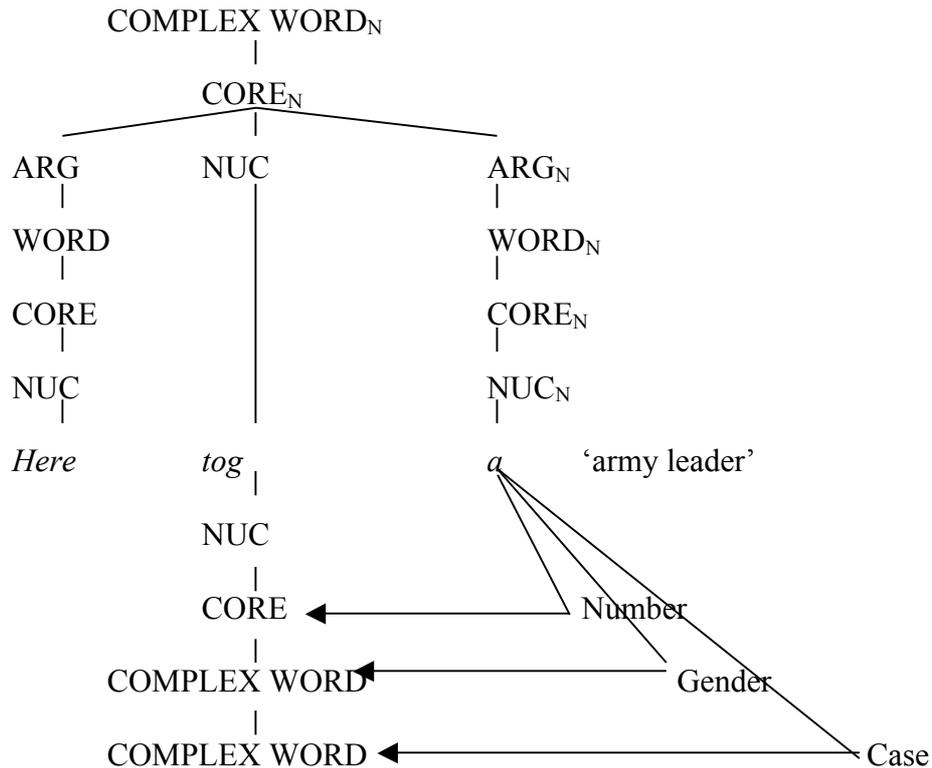
Once the basics of the Layered Structure of the Word have been established, a special provision must be made for the cumulation of two semantic elements that are represented by a single form. Consider the ending *-a* in OE. It can be simply inflective as in (9) or inflective and derivative as in (10):

(9)



Notice that in (9) and (10) gender is considered an operator of the outmost layer of the Word. (9) provides a contextual representation in the NP whereas the representation in (10) is not syntagmatic. In (9) gender is represented as an NP operator because gender is grammatical in OE. This means that it is often necessary to look at other NP operators of definiteness and deixis to determine the gender of the noun (Corbett 1991). As an NP operator, gender expresses agreement and allows for reference-tracking (Foley--Van Valin 1984: 327).

(10)



It is interesting to note that in (9) the categorial feature is projected up the projection of the constituents, whereas in (10) it is projected up the rightmost element first and then perlocates to the CORE node. This gives rise to a basic morphological distinction with cross-linguistic relevance: certain affixes change the structure of the input category, whereas other do not (Anderson 1985b: 22). Consequently, I distinguish two basic morphological constructions in such a way that tree-diagram representations like (9) and (10) constitute particular instantiations of these constructions: the endocentric morphological construction and the exocentric morphological construction, illustrated, respectively by figures 6 and 7:

Figure 6: Endocentric morphological construction

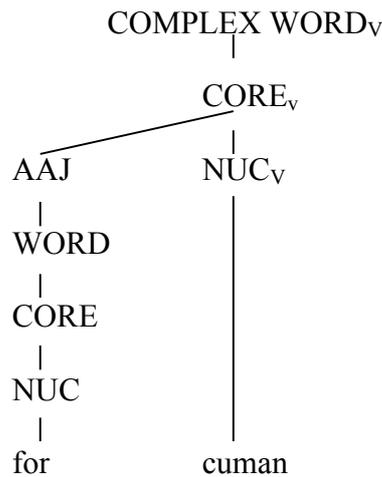
Figure 7: Exocentric morphological construction

This distinction is drawn on the basis of the control of the features relevant for morphology. In an endocentric construction, there is nuclear control of the features in question. In other words, there is projection of features up the layered structure of constituents, but there is not perlocation. For example, *upastigan* 'go up' in Figure 4 is an instance of the endocentric construction. In an exocentric construction, there is argument or operator control of the relevant feature. Put in another way, there is projection of features up the layered structure of constituents and perlocation. For example, *bocere* 'writer' in Figure 2 is a case of an exocentric construction with argument control. This has a theoretical implication with far-reaching consequences: the category Affix does not exist, that is to say, affixes receive the category of their bases in the lexicon. If they can be attached to more than one category, an entry for each base category must be allowed.

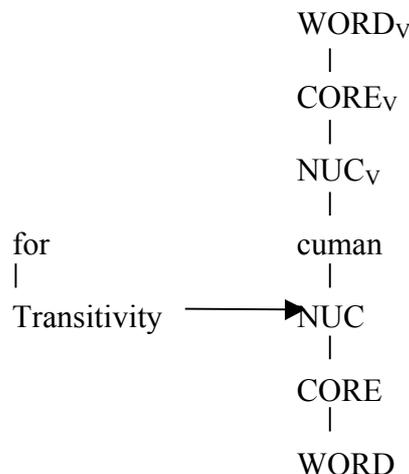
Coming back to the functional distinction between constituents and operators, it not only provides an accurate representation of cumulation of two semantic elements

but also explains what is relationally syntactic (represented in the projection of the operators) and what is non-relationally syntactic and semantically motivated (the constituent projection). In order to furnish additional evidence in favour of the distinction of constituents and operators in the Word, consider instances of polysemy like *forcuman*. The distribution of the accent (*'for'cuman* 'come before' vs. *for'cuman* 'destroy') is the phonological correlate of the insertion of a lexical constituent in the compound verb *'for'cuman* 'come before' and the insertion of a lexical operator in the derived verb *for'cuman* 'destroy'. Example (11) gives the layered structure of *forcuman* 'come before' and (12) the one of *forcuman* 'destroy':

(11)



(12)



Example (12) illustrates the notion of Simplex Word: it contains a single Word node with lexical operators (L-ops) attached at the relevant layers; and example (11) displays a Complex Word, which contains more than one Word node, as a result of the semantically and syntactically- motivated combination of free lexemes or free and bound lexemes. The presence of grammatical operators (G-ops) is not relevant for this distinction.

So far, I have put more emphasis on the projection of the arguments than on the projection of operators. It is my contention that the operator projection devised in this proposal unifies relational morphology (inflection) and non-motivated non-relational morphology (derivation not accounted for by the constituent projection). The ultimate reasons for this claim are diachronic and typological: diachronically, free lexemes

become bound lexemes and bound lexemes become inflectional through processes of grammaticalisation. The constituent projection can account for continuity free-bound lexemes while the operator projection can explain continuity bound lexemes-bound morphemes. Typologically, the expression of some meanings is derivational in some languages whereas it is inflectional in some other languages, as Bybee (1985) demonstrates. The operator projection explains this continuity. It also stresses the properties of derivative bases: affixes that cannot combine with derived stems represent L-NUCops whereas affixes that can combine with derived stems represent L-COREops. The latter can also combine with underived stems, which is consistent with the Principle of Operator Scope: scope over outer layers implies scope over inner layers. Inflection is a G-WORDop. The Word/Complex Word node is the meeting point of relational and non-relational Word syntax: it delimits the inheritance of relational morphological features and the perlocation of non-relational morphological features. This is shown by figure 8:

Figure 8: The node $W/CW=XCAT$

As for derivation in the operator projection, a functional definition of categories, of the kind offered in section 2, brings about a simplification of derivational morphology in the sense that many affixes are mere recategorisers (and the relevant features of the input and the output category are provided by the definition of the category in the lexicon rather than by the derivational process itself). As an argument in favour of this view, it should be borne in mind that in a number of recategorisations it is difficult to decide if the new category results from derivation and inflection or from inflection only. As a brief illustration, consider example (13). (13.a) and (13.b) illustrate inflectional category change: in (13.a) two forms are paradigmatically identical and only vary in syntagmatic occurrence, while in (13.b) two paradigmatically distinct forms result from the conversion of class (I have already referred to this situation as *zero derivation*). Example (13.c) illustrates derivational and inflectional category change: an explicit derivational affix precedes inflection.

- (13) a. *riht* 'right': *riht* 'what is right'
 b. *ecged* 'sharp': *ecgan* 'to sharpen'
 c. *gearo* 'ready': *gearolice* 'readily'

Lexical operators, whether simple recategorisers or conveying a more complex meaning, seem to attach to underived or derived bases in a principled way. Although more research is needed in this area, OE transitivisers are NUCops whereas lexical negation constitutes a COREop. As an illustration, consider:

- (14) a. Causative (L-NUCop)
stepan 'step': *onstepan* 'raise'
fleogan 'flee': *forfleogan* 'put to flight'
liðan 'be bereft of': *beliðan* 'deprive of'
 b. Logical Negation (COREop)
acumendlicnes 'bearableness': *unacumendlicnes* 'unbearableness'
behelendlice 'secretly': *unbehelendlice* 'without concealment'
unforsceawodlice 'unexpectedly': *unforsceawodlice* 'unexpectedly'

Operators are functional labels and can be realised by different categories. For example, the realization of the operator of Lexical negation in OE involves, at least, the following categories:¹⁴

(15)	a.	<i>æ-</i>	<i>æblæce</i>	adjective	'lustreless'
	b.	<i>mis-</i>	<i>misræd</i>	noun	'misguidance, misconduct'
	c.	<i>or-</i>	<i>orceape</i>	adverb	'without cause'
	d.	<i>un-</i>	<i>unaga</i>	noun	'one who owns nothing'
	e.	<i>wan-</i>	<i>wanhal</i>	adjective	'ill'
	f.	<i>-leas</i>	<i>gastleas</i>	adjective	'dead'

Summarising, the Layered Structure of the Word represents elements can be linked to syntax in the constituent projection as lexical arguments; and elements that cannot be linked to syntax in the operator projection as lexical operators. Inflection at Word or Complex Word level is tantamount to inflection at the Nucleus level of the Phrase. Consequently, the node Word or Complex Word represents the limit of perlocation of morphological features as well as the limit of inheritance of inflectional features from the NP. Given the Layered Structure of the Word and the basics of inflection, derivation and compounding, it is necessary to determine what kinds of units take up the semantic-syntactic domains of the Word. In OE, these domains are realised by categories that include bound forms (affixes and stems) and free forms (lexemes), as is illustrated by (16):

- (16)
- a. affixes: *a-* (*ablysung* 'shame', *abolgenes* 'irritation'), *be-*, *-estre*, *-scipe*, etc.
 - b. stems: *-cum-* (*tocuman* 'arrive', *cuma* 'stranger', *cumliðnes* 'hospitality'), *-far-*, *-sac-*, *-secg-*, etc.
 - c. lexemes: *drifan* (*adrifan* 'drive', *onwegadrifan* 'drive away'), *nied*, *ende*, etc.

Given the levels of juncture I have sketched, the types of morphological nexus identifiable in OE derivational morphology include: the coordination of two free forms in figure 9; the subordination of a free form to another free form in figure 10; the subordination of a bound form to a free form in figure 11; and the cosubordination of two dependent forms in figure 12:

Figure 9: Coordination in the complex Word: **upan** 'upon'

Figure 10: Subordination in the complex word (Prefield): **uphebban** 'raise up'

Figure 11: Subordination in the Complex Word (Postfield): **tollere** 'tax gatherer'

Figure 12: Cosubordination in the Complex Word: **twiwæ** 'twice'

Although more research is needed both in the area of lexical operators and in that of juncture levels, this proposal at least constitutes an attempt to contribute to the generalisation of the descriptive and explanatory principles of complex syntactic structures to complex morphological structures. The last part of this section engages more directly with the interplay between syntax and morphology through a morphological template for OE.

The concept of templates with functional positions was proposed by Dik (1997a) and further developed by Bakker (2001) in his dynamic model of expression rules. I have put forward elsewhere (Martín Arista 2006a) that templates in a functional theory of

morphology represent underlying structures that are related to morphological constructions by means of trees. In order to devise a morphological template, it is necessary to decide what categories realise the semantic domains of the Word and the way in which they combine with one another. Bound forms do not combine with bound forms. The combinations affix plus affix and stem plus stem do not occur. On the other hand, it is difficult to decide whether the combination stem plus lexeme occurs or not, since the stem is identical with the lexeme in instances like *medudrinc* 'mead-drink' (noun and stem *drinc*), *secgleac* 'sedge-leek' (noun and stem *secg*), or *slæpwerig* 'sleepy and weary' (noun and stem *slæp*). This leaves us with three possible combinations of classes in OE derivation:

- (17) a. stem plus affix: *a-drincan* 'be drowned'
 b. lexeme plus affix: *of-drincan* 'drain'
 c. lexeme plus lexeme: *win-drinc* 'wine'

Once the classes and combinations in derivation have been established, there is a piece of evidence which is of the utmost relevance for proposing a language-specific morphological template for OE: the maximum degree of complexity that OE words admit. Consider the following examples:

- (18) a. *un-ge-sib-sum-nes* 'discord'
 b. *un-ge-scead-wis-lic* 'irrational'
 c. *un-be-helend-lic-e* 'without concealment'

The maximum degree of complexity in OE words is illustrated by instances like (18). No cases of triple prefixation or suffixation have been found. On account of the evidence produced so far, the template for the OE Word I propose is as follows in (19):

- (19) [PREFIELD 2] [PREFIELD 1] NUCLEUS [POSTFIELD 1] [POSTFIELD 2]

As an illustration, both Prefield slots are filled in (20.a); both Postfield slots are filled in (20.b), while both slots are filled in the Prefield and the Postfield in (20.c):

- (20) a. *ær-ge-fremed* 'before committed'
 b. *higend-lic-e* 'quickly'
 c. *un-ful-frem-ed-nes* 'imperfection'

The insertion of elements into the slots of the template is governed by general principles, syntactic rules and morphological rules. General principles (GP) stipulate that:

GP1. The lexical elements that take up template slots are listed in the lexicon with their selection restrictions and linearization restrictions (Prefield or Postfield).

GP2. Template slots are defined centripetally.

GP3. Arguments and Non-Arguments compete for taking up Prefield and Postfield slots.

GP4. The insertion of lexical and grammatical elements is governed by syntactic and morphological rules.

GP5. The motivation of syntactic rules is semantic; the motivation of morphological rules is to be sought in language processing.

Syntactic rules (SR) are semantically motivated, that is, they relate template slots to Word functions:

SR1. There is one argument slot in the Prefield and another one in the Postfield. If only one slot is filled, it must be POST1:

- (21) a. *mierr-a* 'deceiver'
b. *andett-ere* 'one who confesses'
c. *lær-estre* 'instructress'

SR2. There is one argumental slot in the Prefield and another one in the Postfield. If both slots are filled, these are PRE1 and POST1:

- (22) a. *leoht-bor-a* 'light-bearer'
b. *hrægl-ðen-estre* 'keeper of the robes'
c. *wull-tew-estre* 'wool-carder'

SR3. Argument-Adjuncts must be inserted into the Word Prefield, in PRE2:

- (23) a. *in-genga* 'visitor'
b. *ofer-genga* 'traveller'
c. *æfter-folgere* 'follower'

SR4. Peripheries must be inserted into the Word Prefield, in PRE2:

- (24) a. *in-writere* 'resident writer, secretary'
b. *mete-rædere* 'reader at meal-times'
c. *rap-genga* 'rope-dancer'

Morphological rules (MR) make reference to the morphological nature of lexical elements, whether they are free or bound and whether they are basic or derived:

MR1. If both the Prefield and the Postfield argument slots are filled, the free element is inserted into PRE1 and the bound element into POST1:

- (25) a. *boc-ræd-ere* 'reader of books'
b. *eald-writ-ere* 'writer on ancient history'
c. *horn-blaw-ere* 'horn-blower, trumpeter'

MR2. If free and bound elements are inserted into the Prefield, more separable elements are inserted into PRE2, less separable elements are inserted into PRE1:

- (26) a. *in-a-beran* 'bring in'
b. *forð-be-seon* 'look forth'
c. *in-for-lætan* 'let in'

MR3. If two free elements are inserted into the Prefield, all of them take up a maximum of one Prefield slot, as in (27.a). The choice of PRE2 or PRE1 is determined on the grounds of Word function: arguments in PRE1 and non-arguments in PRE2. This is

motivated semantically: two free elements perform a single function, which is not the case with two bound elements. If one free and one bound element are inserted into the Prefield, they take up two slots, as in (27.b):

- (27) a. **[unriht-hæmed]**fremm-ere 'adulterer'
b. **un-ðurh-sceot-en-lic** 'impenetrable'

MR4. If both morphological slots in the prefield are filled, PRE1 must be taken up by a bound element of the diachronically-consistent series *a-*, *be-*, *ge-*, and *for-*:

- (28) a. *up-a-breccan* 'break out'
b. *ofer-be-beodan* 'rule'
c. *in-for-lætan* 'let in'

The template I have devised for OE derivational morphology is compatible with constructive templates (Van Valin--LaPolla 1997), which take issue with inflectional rather than derivational morphology. It can account in a unified way for the morphological processes of compounding, affixation, zero derivation and extension, as well as for the input and the output of such processes. It combines the stepwise processing of complex words (Marslen-Wilson et al. 1994, Wurm 1997) with a monostratal description of linguistic structures (Dik 1997a, b; Van Valin 2005). It is arranged centripetally, which is consistent with the general principles of semantic organization that attribute the core meaning to the more central positions and the peripheral meaning to the less central position (Hay 2002, 2003). It makes reference to the basic or derived character of the bases of derivation (Giegerich 1999). And, finally, the template imposes a processing restriction on the complexity of derived lexemes (Hay--Plag 2004).

5. Conclusion: summary and lines of research

On the theoretical side, we may conclude that although morphology is largely driven by principles that also rule syntax and semantics, other principles such as feature perlocation and the characteristics of bases and adjuncts remain specifically morphological. As a second theoretical conclusion from the previous discussion, we see that unification and separation in morphology must be carried out on functional grounds. This means, to begin with, that structuralist terms like *compounding* and *derivation* are not explanatory (if not actually misleading) and therefore avoided here. On the descriptive side, we may say that OE derivation does not conform to lexical integrity, understood either as relative ordering of morphological processes or as visibility into morphology.

This discussion opens numerous lines of research, of which I should like to highlight two: lexical operators and the relationship between morphological constructions and templates. I have drawn a distinction between lexical operators and grammatical operators. There remains much to do before the full set of restrictions on lexical operators is known, but partial works such as Lieber (2004) and Cortés (forthcoming) rightly demonstrate that the aim is attainable. It involves, first, the full inventory of lexical functions, in the line of Mel'cuk (1996) or Beard and Volpe (2005); second their relationship with phrase operators as presented in Van Valin--LaPolla (1997) and Rijkhoff (2002); and third, their realization. Regarding the relationship between morphological constructions and templates, the layered structure

(rather than the templates) of the Word provides the fully-fledged functional description. Constructions represent an attempt to reinforce the interlinguistic dimension of the proposal, because cross-linguistically the change of category status by morphological processes is well-attested. Moreover, constructions may prove useful in investigating the impact on morphology of general properties of language and cognition such as asymmetry (as in Martín Arista 2006b) and recursivity.

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² Note that for Lieber (1992) words contain heads, complements and specifiers, whereas Dik (1997a) remarks that the rules that govern clause formation also govern word-formation.

³ Interfaces relate modules to each other and satisfy a number of well-formedness conditions. See Jackendoff (1997).

⁴ For more information, see Anderson (1982, 1985a).

⁵ Adverbs are often accepted as lexical categories in the literature, especially in the FG school (Hengeveld 1992, Mackenzie 2001, Martín Arista 2003, Martín Arista-Ibáñez Moreno 2004). See also Butler (2003). Some authors like Croft (1991) or Baker (2003) deny the adposition the status of lexical category.

⁶ According to Dik (1997a: 194) the noun is primarily the head of the term (noun) phrase. I do not introduce the parameter of headedness in the functional definition of the noun if it does not play any role in the definition of the other major lexical categories. I also avoid theory-internal definitions of categories like Baker's (2003: 290): nouns c-command an element with a shared index.

⁷ See also Lehrer (2000), who explores the semantic similarities between affixes and lexemes and reaches the conclusion that English affixes show some of the semantic properties typical of lexemes, namely polysemy, synonymy and antonymy.

⁸ Everett (2002) might have considered phonological words whereas this proposal is centered on grammatical words. On the difference, see Dixon and Aikhenvald (2002).

⁹ See Anderson (1988) and Spencer (1991) for a more detailed account.

¹⁰ Ackema--Neeleman (2003: 124) gather three types of empirical evidence in favour of lexical integrity: parts of words cannot be moved out of the word; parts of words cannot be moved internally to the word;

words cannot be formed by head-to-head movement. See Haspelmath (2002) and Aronoff and Fudeman (2005).

¹¹ See also den Dikken (2003), who has put forward a checking approach to syntactic word-formation.

¹² Although I have grouped Selkirk's and Lieber and Baker's work, it must be noted that Baker (1988) and Lieber (1992) generate compounds productively whereas Selkirk (1982) does not.

¹³ Van Valin (2005: 12) has suppressed the node ARG because ARG is a semantic notion like REF (which has also been eliminated under NUC_N) or PRED; and because core dummies do not qualify as arguments, while some extra-core constituents represent syntactic arguments of the predicate. Van Valin (2006) proposes an alternative term (Referring Expression) for the Referential Phrase he puts forward in Van Valin (2005: 28). Since these questions are still open to debate, I espouse the model of the Layered Structure of the Clause as set out in Van Valin--LaPolla (1997).

¹⁴ But see Cortés (forthcoming).