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Projections and Constructions in Functional Morphology: The Case of Old English *HRĒOW*

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The aim of this article is to apply the framework of the Layered Structure of the Word (LSW) to the derivational paradigm of Old English *HRĒOW*, thus contributing to the debate over morphology in structural-functional models of language such as Role and Reference Grammar. In general, the line is taken that, although full regularity is an unattainable aim in morphological analysis, a combination of projections and constructions on the explanatory side and syntagmatic as well as paradigmatic analysis on the descriptive side can explain certain synchronic regularities in derivational morphology and take a new look at some unproductive patterns. In synchronic analysis, this research concentrates on processes that apply regularly if the definitions of the source and target category of the derivation are taken into account. In this framework, functional categories may undergo functional adjustment and produce, through linking meaning-form that operates on lexical structures, fully specified words represented by means of the LSW. In diachronic analysis, the derivational paradigm states morphological relatedness both in the synchronic and the diachronic axis. At the same time, the Nuclear Shell Principle stipulates that the Nucleus of the LSW isolates opaque non-productive stem formations that are recoverable in the diachrony only, thus distinguishing unproductive from productive processes in the synchrony. A discussion of the relevance of the LSW to cross-linguistic analysis yields the conclusions that the layered morphological structure and the morphological template are applicable to non-Indo-European languages and that lexical negation, modification, causativity, and relators are leading candidates for universal lexical operators.

Key words: Role and Reference Grammar, morphology, word-formation, constructions, Old English

1. Introduction

Since the turn of the century, a debate over the nature and relations of morphology has been taking place in the functional schools of linguistics.[1] Functional Grammar (Dik

[1] This research has been funded through the project FFI2008-04448/FILO.

1997a, 1997b) has developed the expression component that takes expanded predications and yields linguistic expressions fully specified as to form, order, and prosody (Bakker 2001). Role and Reference Grammar (Van Valin & LaPolla 1997, Van Valin 2005) has applied the layered structure of the clause to the word (Everett 2002) and has defined the word-internal functions that provide an external motivation of some morphological processes (Martín Arista 2008, 2009) and a linking algorithm with syntax and semantics (Cortés Rodríguez 2006a, 2006b, Cortés Rodríguez & Sosa Acevedo 2008).[2] At the same time, the question of the interaction between projections and constructions in a unified theoretical model of a functional orientation has received growing attention.[3] The aim of this article is to contribute to the debate over functional morphology by applying the framework of the Layered Structure of the Word (hereafter LSW) devised in Martín Arista (2006a, 2006b, 2006c) to the derivational paradigm of Old English *HRĒOW*; and, furthermore, by focusing on the relations that hold among the descriptive-explanatory resources of a morphology compatible with functional theories of language in general and with Role and Reference Grammar in particular. On the descriptive side, this article concentrates on the derivational morphology of Old English because it is fairly regular as well as relatively predictable and, moreover, operates on a lexical stock consistently comprised of Germanic items. On the theoretical side, the line is taken that the interplay of paradigmatic and syntagmatic resources can explain morphological processes from several perspectives, including not only semantic-syntactic factors but also some questions of language processing. Within the lexicon of Old English, the derivational paradigm of Old English *HRĒOW*, with its bases *hrēowan* 'to make sorry', *hrēow* 'sorrow' and *hrēow* 'sorrowful', has been chosen for two reasons. In the first place, strong verbs such as *hrēowan* constitute the starting point of lexical derivation in the old Germanic languages in general and in Old English in particular. And, secondly, some strong verbs, including *hrēowan*, display unproductive (zero derivation) patterns of word-formation along with productive ones. In this respect, it turns out that the analysis of the whole derivational paradigm of this verb draws attention to some opaque aspects of derivational morphology associated with diachronic evolution. In this way, this work can also shed light on the question of the limits of the research program in the interaction of morphology, syntax, and lexical semantics, as represented by Baker (1988, 2003) and Lieber (1992, 2004). 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. It is my contention in this respect that, although full regularity is an unattainable aim in

[2] See Sosa Acevedo (2007) on Old English syntax and meaning definitions.
[3] See Butler & Martín Arista (2009) for more information.

morphological analysis, a combination of projections and constructions on the explanatory side and syntagmatic as well as paradigmatic analysis on the descriptive side can explain certain synchronic regularities in derivational morphology and take a new look at some unproductive patterns.

Bearing these guidelines in mind, this journal article is organized as follows: §2 presents and discusses the descriptive-explanatory resources of functional morphology, including the tree diagrams that represent the LSW (§2.1), functional definitions (§2.2), morphological templates (§2.3), and profile and linking (§2.4); §3 applies the morphological framework of the LSW to the paradigm formed by the words morphologically related to Old English *hrēow*; §4 discusses the cross-linguistic relevance of the main concepts and notions put forward by §2 and §3; and, to conclude, §5 summarizes the main contributions of this research.

2. The descriptive-explanatory resources of functional morphology applied to Old English

This section deals with the set of descriptive-explanatory resources necessary to provide a functional explanation for morphological processes. In Old English, inflectional as well as derivational processes can be identified. Derivation in the broad sense (i.e. word-formation) includes compounding, prefixation, suffixation, and zero derivation, illustrated, respectively, by examples such as *hāt-an* (infinitive) 'order', *hēt* (preterite singular), *hēt-on* (preterite plural); *fōtclāð* 'patch', from *fōt* 'foot' and *clāð* 'cloth'; *un-ālȳfed* 'unlawful'; *sǣd-ere* 'sower' and *ac-an* 'ache' > *ece* 'pain' (Kastovsky 1968:61).

This inventory of morphological processes raises two questions that fall out of the bounds of terminology. In the first place, the inclusion of compounding has far-reaching theoretical consequences, which can be summarized as follows: since compounding represents a point of contact between morphology and syntax, regarding compounds as morphological requires the interaction between morphology and syntax because syntactic and semantic notions are necessary to explain the morphological phenomenon of compounding. The transformational tradition has given pride of place to syntax, thus excluding direct reference of syntactic rules to the information of the other components of the theory. The functional tradition, on the other hand, has favored the external motivation of linguistic phenomena (Dik 1986, 1997a, 1997b, Butler 2003) and, in consequence, found no problem in accepting the visibility of syntax, semantics, and pragmatics into morphology (Everett 2002, Martín Arista 2006a, 2006b). On the empirical side, Torre Alonso (2010) has demonstrated that Old English compounding and affixation share the same constraints on recursivity, which represents an additional

argument for including compounding along with affixation under the heading of derivation, at least in Old English.

Secondly, although I use the term *zero derivation* given that it is firmly established in standard morphological terminology, a word of caution is necessary. The structuralist tradition has experienced difficulties in analyzing the functional overlappings and continuity between processes that arise in instances like *drinca* 'drinker', where the *-a* ending is both derivational (agentive) and inflectional (nominative, masculine, singular). The methodology of discrete categories and one-to-one contrasts adopted by structuralism requires that *drinca* be the product of inflection (thus Kastovsky 2005b), which overlooks the facts that the noun *drinca* and the verb *drincan* are morphologically related to each other and that this relatedness is the same that turns up in other pairs of agentive noun and verb such as *andetta* 'one who confesses' ~ *andettan* 'confess', *cuma* 'stranger' ~ *cuman* 'come', *saca* 'opponent' ~ *sacan* 'oppose', etc.[4] While regarding *drinca* 'drinker' as the product of inflection, Kastovsky (1968:74) analyses *ridda* 'rider' as zero derivation because an alternation of double vs. single consonant holds between the infinitive *rīdan* 'ride' and the agentive noun *ridda* 'rider'. If *ridda* is considered in isolation, it is hard to decide whether consonant doubling is phonologically conditioned in the diachrony, as Kastovsky (1968:57) suggests, or constitutes a derivational feature. On the other hand, if *ridda* is analysed in the paradigmatic axis along with its derivational paradigm (*andetta ~ cuma ~ drinca ~ ridda ~ saca ~* etc.) it turns out that the recurrent feature is the suffix *-a*, not consonant doubling. Indeed, the consonant remains double in *andetta ~ andettan* 'confess' and single in *drinca ~ drincan*, *cuma ~ cuman* and *saca ~ sacan*. For all these reasons, zero derivation, in a language with generalized and explicit morphology such as Old English, is defined in this work as derivation without derivational morphemes and/or by inflectional means.[5] This has two consequences central to the outfit of a morphological theory: affixes can be derivational and inflectional at the same time and there is continuity between inflection and derivation, not only cross-linguistically, as Foley & Van Valin (1984) and Bybee (1985) demonstrate, but also intralinguistically.

[4] Kastovsky (1971, 1986) does not include *-a* as a deverbal suffix. See Kastovsky (2005a) on the basic tenets of the structuralist tradition of morphology. See also Beard & Volpe (2005) for a critique of the structuralist approach to zero morphemes, empty morphemes, and morphological asymmetry.

[5] See González Torres (2010) for a more detailed discussion of the continuity inflection-derivation in Old English.

2.1 Trees

The LSW, as devised in Martín Arista (2006a, 2006b, 2006c, 2008, 2009), distinguishes, by drawing inspiration from Van Valin & LaPolla (1997) and Van Valin (2005), three word layers: Nucleus, Core, and Word. Words with syntactically motivated constituents take the additional layer of the Complex Word, which has scope over the layer of the Word. Each layer has an associated set of lexical arguments and lexical operators, in such a way that lexical arguments follow from the principle of structural dependence whereas operators follow from the principle of operator scope. An illustration with *inscēawere* 'inspector' is given by Figure 1:

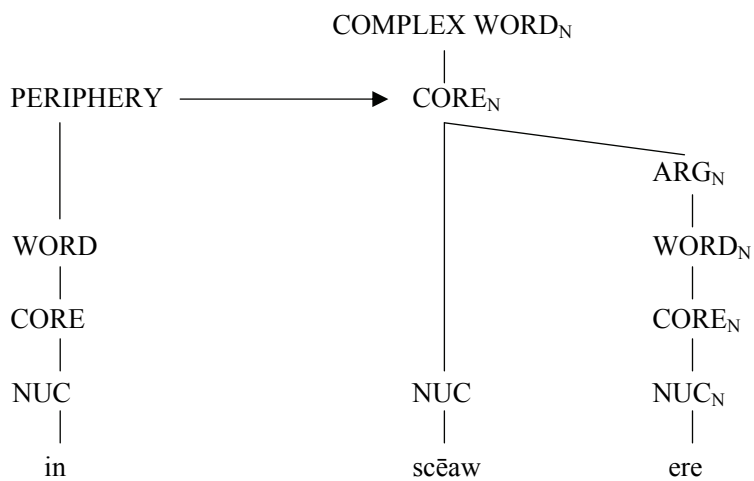


Figure 1: *Inscēawere* 'inspector' in the LSW

Trees representing the LSW constitute instances of two morphological constructions with cross-linguistic relevance: the endocentric construction, in which the features relevant to morphology (including, at least, lexical category) are projected from the Nucleus; and the exocentric construction, in which the features relevant to morphology are projected from a non-nuclear element and percolate to the Core node. The layered representation of *ūp-ferian* 'raise' in Figure 2 exemplifies the endocentric morphological construction, while *inscēawere* 'inspector' in Figure 1 is an instance of the exocentric morphological construction. Notice that separable directionals like *ūp* in *ūp-ferian* 'raise' work as Argument-Adjuncts in a Word Core because they express compulsory direction. Non-separable directionals, as is explained in §4, represent lexical operators.

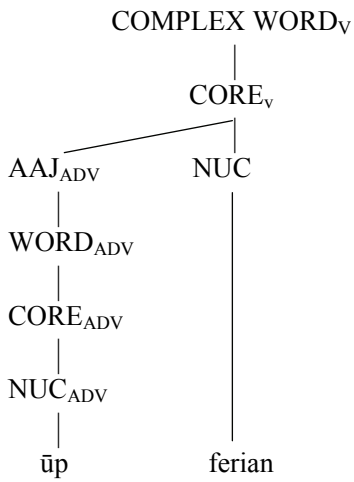


Figure 2: *Ūp-ferian* 'raise' in the LSW

The next step in this discussion is to consider the units that partake in endocentric and exocentric constructions. The lexicon of Old English contains three classes of units that can show up in morphological processes of derivation: affixes (such as *be-* in *behēafdian* 'behead' and *behlīdan* 'close'), stems (like *-cum-* in *tocuman* 'arrive', *cuma* 'stranger' and *cumlīðnes* 'hospitality'), and words (of the type *ende* in *endebyrdan* 'arrange' and *unendebyrdlīce* 'in a disorderly manner'). Whereas in a strictly categorial description lexemes combine with lexemes and affixes while stems combine with affixes, the theory of nexus and juncture put forward by Role and Reference Grammar (Van Valin & LaPolla 1997, Van Valin 2005) provides the tools not only for describing the units involved in complex constructions but also for explaining the relations that hold among these units. An important difference with respect to the general theory of nexus and juncture is worth mentioning, though. Not all the types of nexus and juncture distinguished at the semantic-syntactic level are applicable to the morphological level. The reason is that the only two parameters involved in morphological nexus and juncture are structural (in)dependence and free vs. bound units. Structural dependence is the defining property of subordination, which is illustrated by Figure 3:

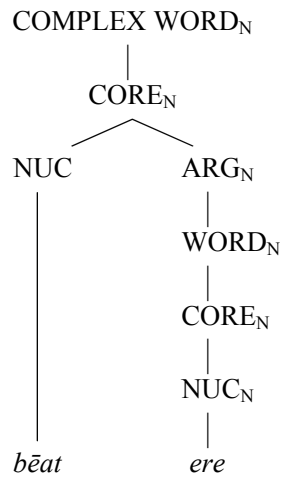


Figure 3: Subordination in the Complex Word: *Bēatere* 'boxer'

The lexical categories Noun, Verb, and Adposition display argumental slots, as can be seen in the structural dependence of the Argument *-ere* on the Nucleus *bēat-* in the Complex Word *bēatere* 'boxer'. In functional terms, the affixal predicate *-ere* takes up the syntactic position of First Argument. Other lexical categories, including the Adjective and the Adverb, as well as affixal predicates, do not allow for argumental slots. For this reason, subordination does not hold in derived predicates such as the de-adverbial derivative *innan* 'inside'. The relevant relations are: coordination if the nuclei implied are free morphemes; and cosubordination if the units partaking in the construction are bound. In other words, the structural independence associated with coordination and the structural interdependence that defines cosubordination result from the combination of units of the same rank: two free forms give rise to coordination in Figure 4 and two bound forms produce cosubordination in Figure 5:

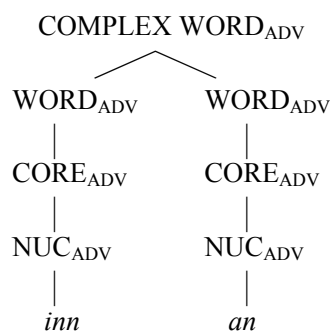


Figure 4: Coordination in the Complex Word: *innan* 'inside'

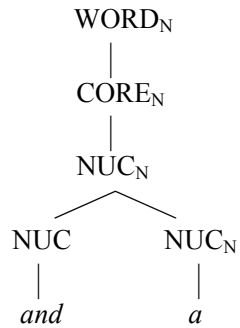


Figure 5: Cosubordination in the Complex Word: *anda* 'anger'

Summarizing, the difference between simplex and complex words in the LSW is established on the grounds of the distinction between arguments and operators. At the same time, the nexus and juncture of complex words makes provision for the difference between free and bound forms, while representing the limit of categorial unification. Trees are instances of morphological constructions of two basic types: the endocentric type and the exocentric type. This distinction has been drawn by accepting the percolation of morphological features that include, at least, category. The question of category is discussed next.

The LSW constitutes an explanatory device because it provides the kind of exhaustive analysis of category and function at multiple levels that functional theories of grammar (and the Linguistic Circle of Prague before them) have been carrying out for nearly thirty years. This functional approach, which insists on relations holding among elements rather than on the classes to which elements belong, has also guided the unification of derivation and compounding that the LSW adopts. The thrust of the argument is that the distinction between compounding and derivation, which represents the processual counterpart of the distinction between lexemes and morphemes, is basically descriptive, whereas the functions performed by the constituents of the word qualify as explanatory. Indeed, the linking of the phrase with the syntax and semantics of the clause, as Cortés Rodríguez (2006a, 2006b) demonstrates, requires functional labels at word level.

The separation of functions along with the associated unification of categories accounts for instances of continuity between free and bound forms throughout grammaticalization processes. A case is point is *frēondlīce* 'friendly, in a friendly manner'. The LSW does not make a case of whether *līce* is a lexeme or a morpheme. Rather, it highlights the shift and adjustment that hold in a derivational process that takes a member of the category Adjective (*frēond*) as input and turns out a member of the category Adverb (*frēondlīce)* as output. Categories are defined functionally (internally

and externally) in a way inspired by previous work in the functional school (Hengeveld 1992, Dik 1997a, Mackenzie 2001, Martín Arista 2003, Martín Arista & Ibáñez Moreno 2004, among others), which allows for semantic generalizations like the following one: properties such as *being a friend* are often related to manners like *doing something in a friendly way* by means of derivational processes. The same is applicable to the derivation of Old English weak verbs from nouns and adjectives by means of formally and semantically transparent processes, as in *syn* 'sin' (Noun): *syngian* 'to sin', *cōl* 'cool' (Adjective): *cōlian* 'to cool', *in* 'inside' (Adverb): *innian* 'to go in' and *ofer* 'over' (Adposition): *oferian* 'to elevate'. If the argument is correct, and a rich definition of lexical categories is adopted, a number of derivational processes can be explained by means of the notions of functional shift and functional adjustment, the former motivating the latter. The following section deals with this question.

2.2 Functional definitions

The functional definition that is proposed in this section assumes maximal iconicity between the internal structure of the category and its external function, in such a way that the Verb, for instance, displays two internal positions that iconically reflect the two argumental slots of transitive verbs. At the same time, Lyons' (1977) semantic hierarchy is adopted: zero order entities (properties and relations) are predicated of first order entities (beings) in second order entities (predications). Adjectives, in this proposal, are represented as a feature of the Noun, whereas the Verb has the most complex structure, containing both the Noun structure and the Adjective structure. Stated in very general terms, functional definitions have the following form:

$\text{PREDICATE}_{\Sigma}$ [X: F_{α} …F_{Ω}] (x) (y)
where Σ is a major lexical category, X stands for the form of the predicate, F_{α} …F_{Ω} are meaning features and x, y are structural dependents on PREDICATE

Figure 6: The functional definition of categories

The basic distinction between the lexical categories to be defined has to do with the main semantic properties of, respectively, phrase and clause. A noun phrase is a syntactic category that can be used with a referential function, whereas a clause is a syntactic category that can be used with a predicative function (adapted from Van Valin & LaPolla 1997). The model aims at cross-linguistic relevance and, consequently, is formulated in language-independent terms. It runs as follows.

The major lexical classes can be classified into potentially referential and potentially predicative categories. The Noun is a potentially referential category which is defined as

predicate$_N$: (x) (BE-y), where x is an entity that can display the property y and BE is a stative meaning feature. The Verb is a potentially predicative category which is defined as predicate$_V$: (x) (DO-z), where z can be predicated of the entity x and DO is a non-stative meaning feature. In these definitions, BE and DO are used for representing the difference between stative (typically BE and HAVE meanings) and non-stative meaning features (typically DO meanings).[6] These definitions do not draw any distinction between clausal and phrasal predication, in such a way that modification in the noun phrase is the same as non-verbal predication. Indeed, there are languages in which there are no copulative verbs (Hengeveld 1992) and, consequently, no difference can be identified between predicative and attributive adjectives. Dixon (2006) focuses on the existence of verb-like and noun-like adjectives in some languages (e.g. *green*, *be green*, *what is green*), which in the context of this framework can be stated in the following terms: cross-linguistically, the category Adjective can conform to the feature *y*, to the structure (BE-y) and to the structure predicate$_N$: (x) (BE-y). Intralinguistically, the Adverb can be an argument of the potentially predicative category, the Verb, which is represented by means of the definition predicate$_V$: [(x) (DO-z) [(BE-y)]$_{Adv}$]$_V$, where BE-y contributes meaning features associated with manner, location, and time. The potentially referential category, the noun, is an argument of the Adposition, as is reflected by the definition predicate$_{Adp}$: [(x) (BE-y)]$_N$ [(BE-w)]$_{Adp}$, where BE-w contributes meaning features that restrict the temporal or spatial scope of x.

Before these functional definitions of categories are associated with word structure in §2.4, which is about profile and linking, it is necessary to define the language-specific morphological template of Old English. This is done in §2.3.

2.3 Morphological templates

Trees and constructions follow the requirement of monostratal representations adopted by functional theories of language and constitute a top-down device in the sense of Butler (1990): they proceed from the more complex to the less complex, from the analyzable to the non-analyzable segments. However, the syntagmatic axis of structural-functional morphology cannot be restricted to trees for reasons of processing and analysis. Studies in the field of psycholinguistics like Marslen-Wilson et al. (1994) and Wurm (1997) point out that the processing of complex words is, at least partly, decompositional. Lexical decomposition is not directly compatible with trees, which conform, as I have just remarked, to the principle of monostratal representation. Consider

[6] Note that the feature DO, unlike **do'** (Van Valin & LaPolla 1997, Van Valin 2005), does not imply lexicalized agency. This feature draws a distinction between verbal predications of the type predicate$_V$: (x) (DO-z) and non-verbal predications of the type predicate$_N$: (x) (BE-y).

the case of *inscēawere* 'inspector'. As in its Present-day English translation, the formation is recursive, in such a way that the deverbal agentive *scēawere* 'inspector' is further derived by means of the modifier *in* 'inner'. This is represented as in Figure 7:

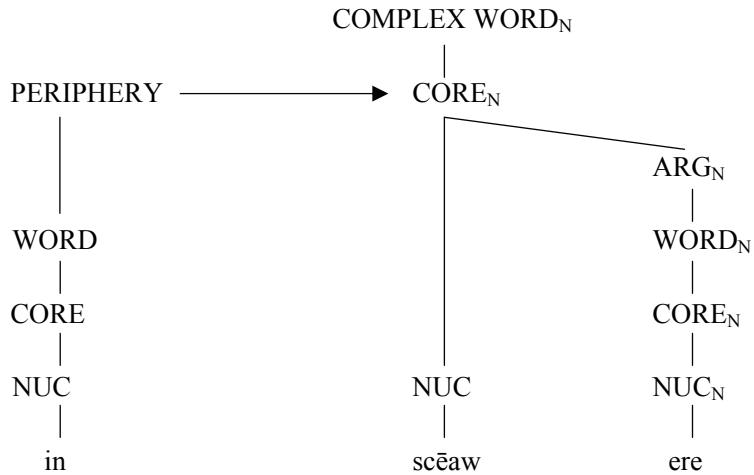


Figure 7: Recursivity and order in *inscēawere* 'inspector'

The tree in Figure 7 does not establish the relative order of the processes of affixation (*scēaw*-*ere*) and compounding (*in*-*scēawere*). Neither does it establish that the affix -*ere* takes up the Postfield position with respect to the Nucleus *scēaw*-. That is, trees account for relations of hierarchy (*scēaw* is the Nucleus of *scēawere*) and dependency (-*ere* is directly dominated by *scēaw*-) but their order is arbitrary in the sense that it does not describe the linearization of the linguistic expression. It is necessary, therefore, to introduce a bottom-up device that proceeds stepwise and assigns the relative position of elements, that is, the linearization of the constituents of the Word with respect to one another. This device is the morphological template.

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. Unlike morphological constructions, which are relevant to typology, templates qualify as language-specific. The morphological template for Old English must account in a unified way for the derivational and inflectional processes of morphology, as well as for the input and the output of such processes. The morphological template that I propose has two basic properties: first, it is arranged centripetally; that is, it draws on 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); and, second, it combines the stepwise processing of complex words (Marslen-Wilson et al.

1994, Wurm 1997) with a monostratal description of linguistic structures (Dik 1997a, 1997b, Van Valin & LaPolla 1997, Van Valin 2005). Along with these properties, templates impose two kinds of restrictions: selection restrictions that make reference to the basic or derived character of the bases of derivation (Giegerich 1999); and processing restrictions on the complexity of morphologically derived lexemes (Hay & Plag 2004).

The methodology for defining a template consists of two steps. In the first place, it is necessary to determine what the maximal complexity is that the Old English Complex Word admits. The maximal degree of complexity, considering the empirical evidence that has been found, is represented by instances like *un-for-**hæf**-ed-nes* 'incontinence', *un-ge-**mōd**-ig-nes* 'contentiousness', *un-ā-**sundr**-od-lic* 'inseparable' and *un-be-**grīp**-end-lic* 'incomprehensible'. Whereas these examples are either nouns or adjectives, verbs admit two prefixes, but not two suffixes. Moreover, no instances of triple prefixation or suffixation have been found in Old English word-formation. The only counterexample that might be adduced is *tō-for-an-settan* 'set before' (Clark Hall 1996), of which there are two instances in *The Dictionary of Old English Corpus*, although both occur in Latin-Old English glosses, which points at a literal translation. Moreover, it is questionable whether *foran* in *toforansettan* represents two prefixes or just one. This advises to restrict to two the maximal degree of complexity in the Prefield and the Postfield of the Complex Word.

The second methodological step in the definition of the template for Old English morphology is to decide whether pre-derivational inflection takes place or not. The evidence in this respect is conclusive: productively or not, bases often show explicit inflectional marking. The following bases of derivation, for instance, are inflected: *ælm**es**bæd* 'gratuitous bath' (genitive), *gēom**or**frōd* 'very old' (comparative), *ende**mest**nes* 'extremity' (superlative), *ōle**ht**ung* 'flattery' (preterite), *ācwell**ed**nes* 'slaughter' (past participle) and *āwyrig**end**e* 'accursed' (present participle).

On the grounds of the methodology I have followed regarding complexity and inflection in derivation, the maximal morphological template for Old English can be rendered as in Figure 8. Notice that the Nucleus admits pre-derivational inflection and that the Postfield 2 position displays the inflectional ending, either by itself or in combination with a derivational segment.

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

Figure 8: The morphological template of Old English

The template in Figure 8 represents a maximal template, hosting complex formations like ***un-ful-**frem**-ed-nes*** 'imperfection'. This maximal template can be broken down into minimal templates consisting of just the Nucleus, or the Nucleus plus one Prefield

or one Postfield slot or combinations of the Nucleus and one slot in the Prefield and two in the Postfield or viceversa. For instance, ***ær-ge****-fremed* 'before committed' requires a template with two Prefield slots before the Nucleus ([PREFIELD 2] [PREFIELD 1] NUCLEUS), whereas *hīg-**end-līce*** 'quickly' calls for a template consisting of the Nucleus and two Postfield slots (NUCLEUS [POSTFIELD 1] [POSTFIELD 2]).

Template selection as well as the insertion of elements into the centripetally arranged slots of the template are governed by syntactic and morphological rules (Martín Arista 2008). General principles make provision for the motivation of such rules. General principles require that syntactic rules are semantically motivated, that is, they relate template slots to word functions. It also follows from general principles that morphological rules make reference to the morphological properties of lexical elements, their category, whether they are free or bound and whether they are basic or derived. For example, there is a syntactic rule that stipulates that the Periphery must be inserted into the Word Prefield, as in *ær-gefremed* 'before committed', and a morphological rule which predicts that negation is a Core operator, thus able to apply to previously derived words, such as *unfulfremednes* 'imperfection' from *fulfremednes* 'perfection'.

2.4 Profiling and linking

Summarizing what has been said above, templates in a structural-functional theory of morphology represent underlying structures that are related to morphological constructions by means of tree diagrams. Morphological templates are language-specific, whereas the distinction between endocentric and exocentric morphological constructions may be typologically relevant. Morphological templates allow for an analysis both from the point of view of the bases and the affixes involved in derivational processes and, more importantly, are consistent with the semantic principle of centripetal organization. Tree diagrams constitute layered structures that project lexical constituents and operators. Trees, in this view, unfold templates and map template components onto structural or functional blocks of morphological constructions. This section focuses on the mapping from templates onto the trees that represent the LSW or, in other words, on the linking meaning-form in word-formation. The concept of linking draws on Van Valin & LaPolla (1997), with the important difference that the meaning-form direction only is considered here.

In order to take steps towards describing the basic and the derived lexicon by means of the same syntagmatic and paradigmatic procedures, I adopt Pounder's (2000) structuralist proposal for meaning definitions and meaning changes resulting from word-formation processes. According to Pounder, lexemes are signs of the form < X; 'X'; Σ >, where 'X' is a formal feature and Σ a categorial feature. The word-formation

rules that apply to lexemes can be broken down into (i) a form rule < X → Y; 'FR$_X$'; Σ > whereby the input to the rule X undergoes a formal modification; (ii) a semantic rule < *f* ('X'); 'SR$_X$' ; Σ > which stipulates that the semantic relationship between the input and output of the process can be stated in terms of a lexical function *f* ('X'); and (iii) a syntactic rule < $\Sigma_X \rightarrow \Sigma_Y$; 'ΣR$_X$'; Σ > which accounts for the change in the lexical category Σ. For instance, a derivation such as *read* > *reader* entails the formal modification resulting from the addition of the segment *-er*, the assignment of the lexical function (profile) Effector, and the category change from Verb into Noun.

In Pounder's (2000) terminology, this section focuses on two kinds of word-formations. On the one hand, there are derivations that require an explicit semantic rule which, along with the syntactic rule, motivates the form rule. This calls for profiling a subjective derivative like *ierfa* 'heir' and its objective counterpart *ierfe* 'heritage' in a different way. On the other hand, the semantic and the syntactic rule of some derivations can be subsumed under a single formalism as a result of the lexical relationship between the base and the derivative, which is predictable from the categorial change determined by the syntactic rule, as in *frēond* > *frēondlīce*. This requires a paradigmatic approach that guarantees that the lexical relationship *frēond* > *frēondlīce* is recurrent in terms of form and meaning and a strong definition of lexical categories which predicts that the Adverb typically expresses manner with nominal and adjectival bases of derivation.

In order to deal with derivations that require both a semantic and a syntactic rule, I introduce two lexical functions based on distinctions central to the semantics-syntax interface of functional theories, namely Effector and Affected. In the linking meaning-form, underived functional categories on which second order entities can be built may be profiled as for Effector and Affected in a Simplex Word structure, while derived functional categories on which second order entities can be built may undergo functional shifts with the corresponding functional adjustment in a Complex Word Structure, as well as Effector/Affected profiling. Beginning with profile, consider the following Old English pairs: *cuma* 'stranger' ~ *cyme* 'coming', *ierfa* 'heir' ~ *ierfe* 'heritage', *gilda* 'member of a brotherhood' ~ *gilde* 'membership of guild', *secga* 'sayer, informant' ~ *secge* 'speech', *stēora* 'steersman' ~ *stēore* 'direction', etc. The first member of these pairs, inflected for the masculine gender, is the result of Effector profiling, whereas the second member of these pairs, inflected for the feminine or neuter gender, results from Affected profiling.[7] *Effector* is used with the sense of the unspecifed initiator of an activity, as in Van Valin & LaPolla (1997). *Affected* is inspired in Foley & Van Valin's (1984) Undergoer and constitutes, in the current framework, the unspecified target of an activity in the unmarked option; and the unspecified patient of a state in the marked option. The First Argument slot of the functional category is filled when the Effector is

[7] See Cortés Rodríguez (2006a, 2006b) on macroroles in word-formation.

profiled, as in *secga* 'sayer, informant' and, conversely, the Second Argument slot of the functional category is filled when the Affected is profiled, as in *secge* 'speech'.

The maximal number of expressed arguments in a Simplex Word is one, whereas it is two in a Complex Word. In this sense, profiling is different in the Simplex and the Complex Word. In the Simplex Word, the effect of profiling is the selection of a maximum of a single argument, to the exclusion of the other. In the Complex Word, on the other hand, the effect of profiling is to highlight or foreground an argument out of a maximum of two, the other one being backgrounded. In Figure 9, a derived functional category on which a second order entity can be built profiles the Effector as First Argument and the Affected as the Second Argument in a Complex Word Structure. That is, the deverbal nominal *ringestre* 'female ringer' takes a second argument *bell* 'bell'. The construction is parallel to the one found in Present-day English, in which the compound *bell ringer* has a clausal counterpart *someone bells a ring*.

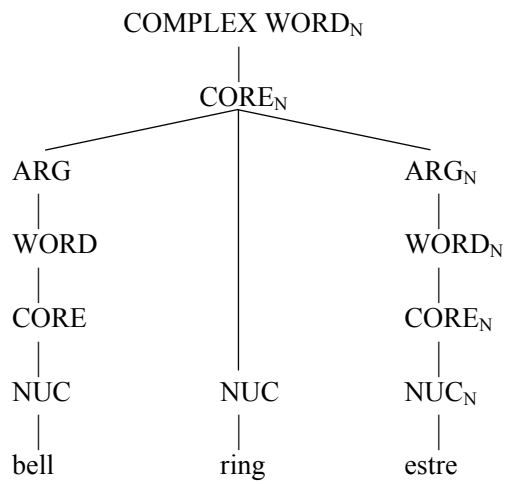
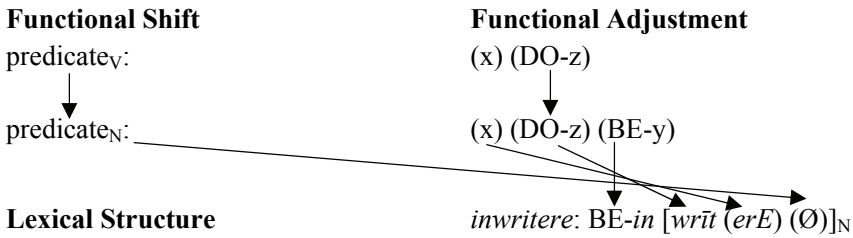


Figure 9: First and Second Argument in *bellringestre* 'female bell ringer'

Derived functional categories may undergo adjustment after profiling. The notion of adjustment is based on Dik (1997b:158). Adjustment takes place in two steps: functional shift and functional adjustment, in such as way that the former motivates the latter. In Figure 10, the functional shift imposed by the syntactic rule of recategorization Verb-Noun causes functional adjustment of the derived functional category, which inherits the verbal features expressed by the feature DO and the argument z. The derived functional category is linked to the lexical structure of *inwrītere* 'inner secretary' as shown below.



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

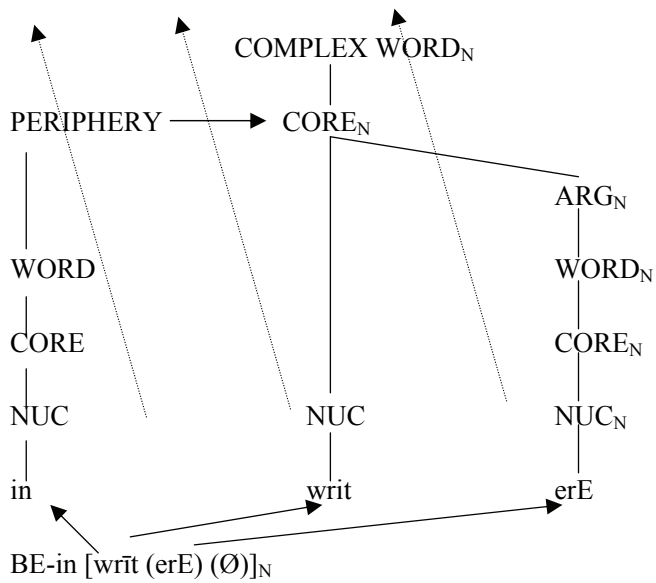


Figure 10: Adjustment and linking in the lexical structure of *inwrītere* 'inner secretary'

As can be seen in Figure 10, the lexical structure corresponding to *inwrītere* 'inner secretary' results from the linking of the categorial feature Noun as well as the arguments z and y and the features DO and BE. The Effector profiling guarantees that the First Argument position is filled whereas the Second Argument position is empty. Template insertion rules linearize the feature BE expressed by *in-* and performing the function of Periphery in Prefield 1; the feature DO expressed by *wrīt-* and performing the function of Nucleus in the Nucleus position of the template; and the argument x expressed by *-ere* and serving the function of First Argument in Postfield 1. The construction is also parallel to the Present-day English one. The deverbal agentive *wrītere* 'writer' is modified by the Periphery *in* 'inner'.

When it comes to explain a lexical relationship predictable from the categorial change stated by the syntactic rule, two aspects call for attention. Firstly, there appear

instances of de-adjectival verbal derivatives such as *cealdian* 'to become cold' produced in a fairly regular way from adjectives like *ceald* 'cold'. The intransitive version is favored, in such a way that the transitive one is a diachronic development compatible with the process of verbal transitivization identified by Visser (1963-1973:99). This is the case with *cōl* 'cool' and *cōlian* 'to become cold' > *cōlian* 'to become cold, to cool'. Secondly, we come across numerous adverbial derivatives that hold a systematic relation to their nominal or adjectival bases. This is the case regardless of whether the adverbial affix is originally inflectional, as in *glēaw* 'wise' > *glēawe* 'wisely', or it represents the grammaticalization of an earlier free form, as in *gearo* 'ready' > *gearolīce* 'readily'.

Figure 11 summarizes what has been said so far by specifying the units and procedures involved in the linking meaning-form in the Complex Word. Although I shall not have much to say about phrases in this article, Figure 11 also contextualizes the units and procedures at Word level in the wider setting of Phrase level:[8]

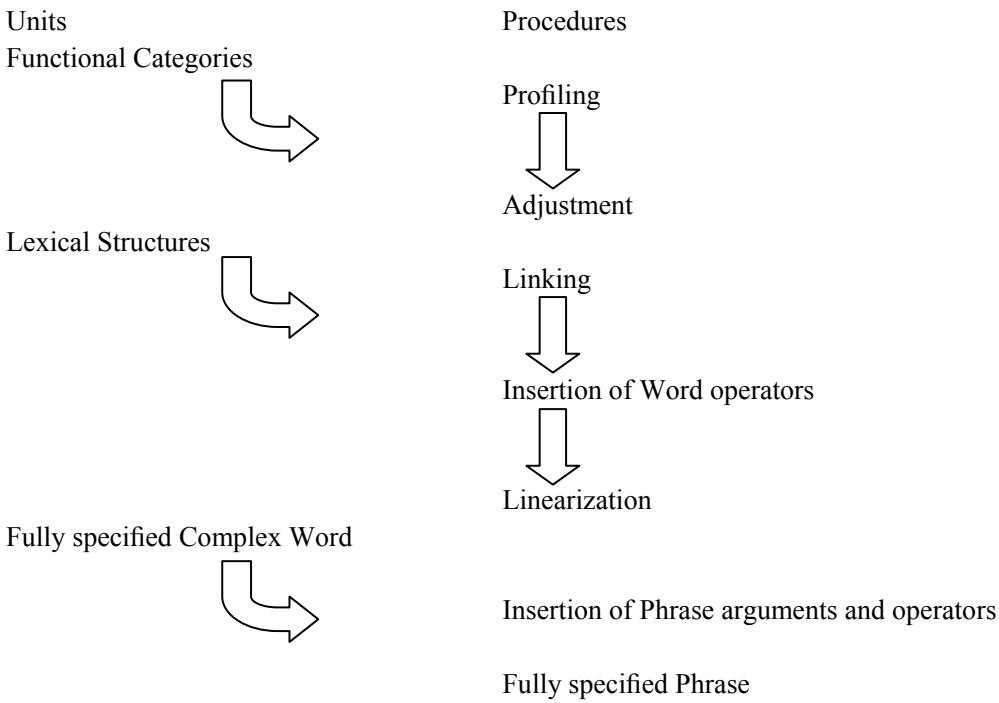


Figure 11: Units and procedures of the linking meaning-form in word-formation

[8] On noun phrase and noun phrase operators, see Rijkhoff (2002) and Rijkhoff & García Velasco (2008).

Given that some languages express as a Word operator what other languages express as a Phrase operator, the main advantage of the units and procedures represented in Figure 11 is that the continuity between the Word and the Phrase is guaranteed. Although more research is needed in this area, the acknowledgment of this continuity and the study of the relation with the Clause have been two of the strongholds of functional syntax, thus the works by Van Valin & LaPolla (1997) and Hengeveld & Mackenzie (2008).

3. *HRĒOW* in the LSW

In this section I apply the LSW framework to the paradigm formed by the words morphologically related to Old English *HRĒOW*. As I have remarked above, a strong verb derivational paradigm has been chosen because the derivational morphology of Old English largely revolves around strong verbs and because this morpho-lexical class has derivatives resulting from productive as well as unproductive derivational processes. The derivational paradigm of *HRĒOW* includes (see the appendix for unlemmatized forms): *behrēowsian* 'repent', *behrēowsung* 'repentance', *blōdhrēow* 'bloodthirsty', *hrēow* 'sorrow', *hrēow* 'sorry', *hrēowan* 'make sorry', *hrēowcearig* 'troubled', *hrēowig* 'sad', *hrēowigmōd* 'sad at heart', *hrēowlic* 'miserable', *hrēowlīce* 'cruelly', *hrēowness* 'penitence', *hrēowsian* 'be sorry', *hrēowsung* 'sorrow', *ofhrēowan* 'to cause or feel pity', *unbehrēowsigende* 'unrepenting', *wælhrēow* 'cruel', *wælhrēowlic* 'cruel', *wælhrēowlīce* 'cruelly' and *wælhrēowness* 'cruelty'. Given that the base of the derivation of *hrēowcearig* 'troubled' and *hrēowigmōd* 'sad at heart' is not *hrēow* but *cearig* and *mōd*, respectively, *hrēowcearig* and *hrēowigmōd* do not belong in the derivational paradigm of *hrēow*.

HRĒOW, being the shared element, constitutes the base of the derivational paradigm. This stance is a synthesis of the proposals made by several scholars. For Hinderling (1967), strong verbs such as *hrēowan* 'make sorry' represent the starting point of Germanic derivation, which comes in the wake of Schuldt (1905), who is in favor of the double derivation from the strong verb *hrēowan*, which constitutes the source of the weak verb *hrēowsian* and the feminine noun *hrēow*. Hallander (1966:374), on the other hand, supports the view that the adjective *hrēow* 'sorrowful' is the source of, at least, *hrēowsian* 'be sorry' but admits that the material for arguing in favor of an adjective like *hrēow* 'sorrowful' is scarce, considering that there is one only occurrence of such an adjective; and, moreover, *hrēowe* in the context *in hrēowum tēarum* is ambiguous between noun and adjective, both inflected in *-um* for the dative plural.

The derivational paradigm of *HRĒOW* is partly transparent and partly opaque. The opaque part of the derivational history of the Word can be explained in terms of a product of the Nucleus of the LSW. Given that in the LSW non-recursive derivation

takes place in the Core whereas recursive derivation takes place at the level of the Word, the formation of stems must be previous to the insertion of arguments into Core slots. This can be stated in terms of the Nuclear Shell Principle, which stipulates that the Nucleus of the LSW isolates opaque non-productive stem formations that are recoverable in the diachrony only. The Nuclear Shell Principle makes for the integration of diachronic facts into the LSW and, more importantly, separates unproductive from productive processes in the synchrony. In the case of the derivational paradigm of *HRĒOW*, the Nuclear Shell Principle predicts that the noun *hrēow*, the adjective *hrēowe* and the strong verb *hrēowan* ultimately constitute instantiations of the stem *hrēow-*. In other words, the discussion whether *hrēowe* (provided that the existence of the adjective is admitted) or *hrēowan* is the base of the paradigm becomes, to a good extent, irrelevant. Not only because the available data will not shed more light on the question, but also because the stem is the origin of the derivation and to choose the adjective or the strong verb does not add any explanatory fact to the derivational process. Since inflection results from the insertion of operators, the Nuclear Shell Principle basically accounts for the fact that the Nucleus will turn out derivational bases with categorial labels. The morphological classes of nouns are intrinsic (as in *hrēow*), whereas the morphological classes of verbs follow from their status (as in the basic strong verb *hrēowan* as opposed to the derived weak verb *hrēowian*). As has been said above, Word and Phrase operators guarantee the form of the inflectional paradigm of HRĒOW, namely *hrēow*, *hrēowe* and *hrēowan*, required by the syntagmatic context, as can be seen in Figure 12:

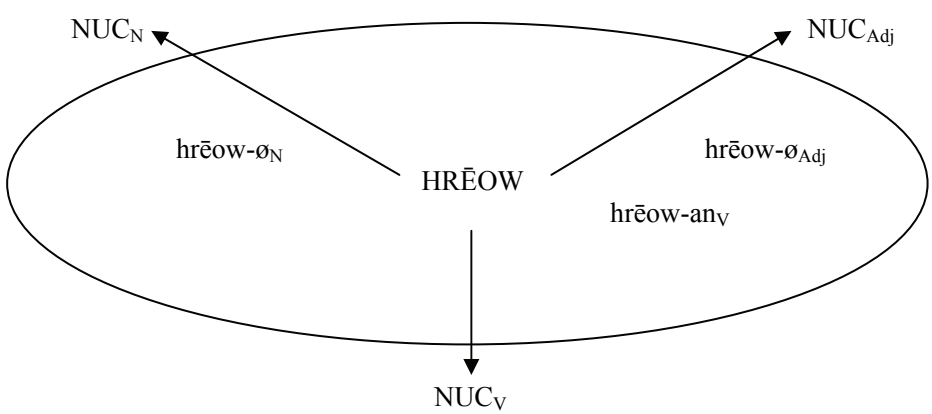


Figure 12: The Nuclear Shell Principle applied to *HRĒOW*

The Nuclear Shell Principle, if applied to the derivational paradigm of HRĒOW, isolates the noun *hrēow*, the adjective *hrēowe* and the strong verb *hrēowan* from the rest of the paradigm. The rest of the derivatives in the paradigm display explicit derivational

or compositive adjuncts productive in the synchrony. In other words, the Nuclear Shell Principle draws a dividing line between productive, synchronic, affixal, word derivation on the one hand, and unproductive, diachronic, zero morpheme, stem derivation, on the other. This means that morphophonological alternations hold in the Nucleus and are separated from other morphological phenomena by means of the Nuclear Shell. For example, given a derivational paradigm with a base of derivation such as *bindan* 'bind', the form *bend* 'bond' results from the operation of this principle and works as input to further derivations affecting the Core, like *inbend* 'internal bond'.

Once the adjectival Nucleus *hrēowe* is available for derivation, it can be associated with a Periphery as in *wælhrēowe* 'cruel (in battle)', represented by Figure 13:

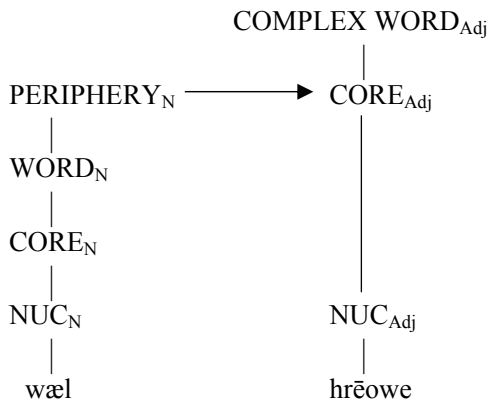


Figure 13: Periphery in *wælhrēowe* 'cruel (in battle)'

In Figure 13 the resulting constructions is endocentric, because the category label is projected from the Nucleus upwards. In Figure 14, which describes an exocentric construction, the category of the Complex Word is provided by the relator or lexical operator of relatedness realized by the suffix *-ness*, which turns the category Adjective into Noun.

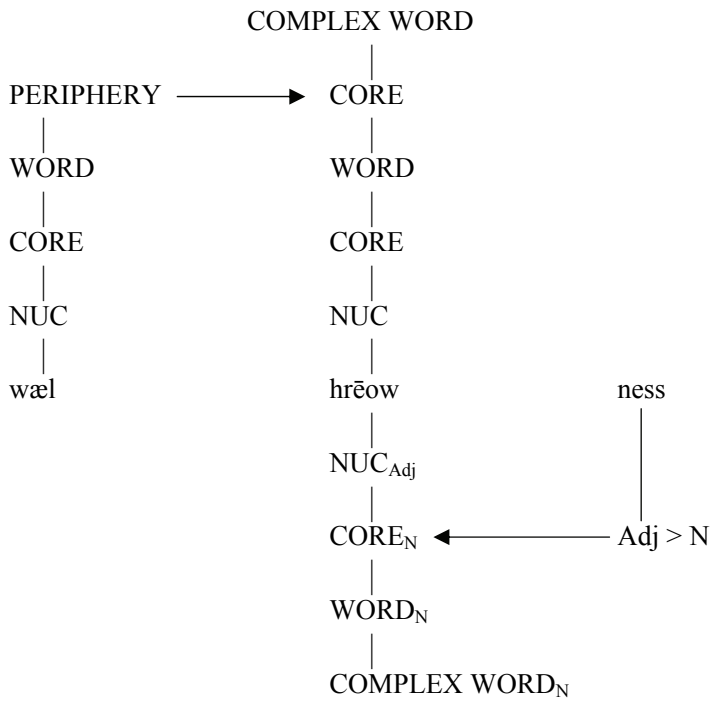


Figure 14: Recategorization: *wælhrēowness* ‘cruelty (in battle)’

The weak verb *hrēowian* ‘be sorry’ (< *hrēow* ‘sorry’) also represents an instance of recategorization by means of a relator, with the significant difference that, unlike the suffixal *wælhrēowness*, it does not display a derivational affix. The weak verb *hrēowsian* ‘to feel sorrow’ also displays a recategorizing suffix (*-sian*). Both *hrēowian* and *hrēosian* conform to the intransitive pattern of derivation described as diachronically primitive with respect to the transitive one. Finally, the adverbial derivative *wælhrēowlīce* ‘cruelly’ is derived from *wælhrēow* ‘cruel’.

4. Discussion

As presented in §2 and §3, the LSW establishes a continuum between compounding and derivation by unifying processes with a syntactic counterpart in the projection of constituents, as well as relational morphology (inflection) and non-motivated non-relational morphology (derivation not accounted for by the constituent projection) in the projection of operators. That is, the functional distinction between constituents and operators not only provides an accurate representation of the combination of two semantic elements but also explains what is relationally syntactic (represented in the

projection of the constituents) and what is non-relationally syntactic and semantically motivated (the operator projection). This makes the LSW particularly useful in explaining continuities and areas of overlapping between morphological phenomena, like inflection or compounding vs. derivation. Such continuities arise both in the diachronic and the cross-linguistic dimensions. In diachronic analysis, free lexemes become bound (Brinton & Traugott 2005) while derivational morphemes become inflectional through processes of grammaticalization (Greenberg 1991). In cross-linguistic analysis, what is expressed inflectionally in a language may be expressed derivationally in another language (Foley & Van Valin 1984, Bybee 1985).

In a nutshell, the constituent projection of the LSW can account for continuity between free and bound lexemes while the operator projection can explain continuity between bound lexemes and bound morphemes. As in the Layered Structure of the Clause, it is possible for a segment to perform the double function of grammatical operator and lexical constituent or grammatical operator and lexical operator, as well as to realize two inflectional or derivational functions. Put in these terms, the LSW is a morphological framework involving the unification of different units serving the same function, as well as the separation of different functions realized by the same units. While this contributes to the functional orientation of the proposal, because categorial notions are subservient to functional notions, the cross-linguistic applicability of the LSW calls for some comment. Even though an exhaustive application of the LSW to other languages remains a task for future research, the lookout that follows stresses the relevance of some of the concepts introduced in previous sections and, moreover, demonstrates the applicability of the lexical operators of the LSW to some non Indo-European languages.

Beginning with Indo-European languages, the Sanskrit language can provide evidence in favor of the relevance of certain aspects of the LSW. In effect, Sanskrit has two sets of affixes, called *primary* and *secondary*, that attach, respectively, to verbal roots and derivatives of verbal roots by means of primary suffixes. Thus series of verbal root and primary derivatives like √*grah* 'to hold' ~ *graha* (adjective) 'holding' ~ *graha* (masculine) 'planet' (Egenes 2005:45).[9] Secondary suffixes produce adjectival, possessive, abstract, and participial derivatives (Kumar Das 2002). For instance, the primary suffix -*a* turns out *veda* (masculine) 'knowledge' from the verbal root √*vid* 'to know', while the secondary suffix -*ika* yields the adjective *vaidika* 'relating to the Veda' by attaching to the base of derivation *veda*. In the LSW, Sanskrit primary affixes attach at Core level, where non-recursive productive derivation takes place, secondary affixes operating at Word level. On the functional side, profiling accounts for the distinction between the Effector *avatāra* (masculine) 'one who crosses down' and the Affected *tāra* (masculine) 'crossing'. Further evidence for the LSW can be found in Sanskrit, specifically in the

[9] The notation √ expresses the root morpheme.

area of lexical operators. Beginning with non-verbal classes, Sanskrit has a pair of modifiers, which consists of the appreciative prefix *su-* and the pejorative prefix *dus-*, which may be of cross-linguistic relevance. Instances in point are *sugīta* 'well sung', subodha 'easy to understand', *durjaya* 'difficult to conquer' and *dūrakta* 'badly colored' (Egenes 2005:76). The same applies to the negative prefix *a*(*n*)- realizing the lexical operator of lexical negation, which can be broken down into, at least, oppositive and reversative as in, respectively, *avidyā* 'ignorance' (from *vidyā* 'knowledge') and *anuditvā* 'not having spoken' (from *uditvā* 'having spoken'). Turning to verbs, lexical directionals such as *ā-*, *upa-* and *prati-* attach to this class as in, respectively *āgacchati* 'he comes', *upāgacchati* 'he approaches' and *pratigacchati* 'he returns (compare *gacchati* 'he goes')[10]. More importantly, the lexical operator of causativity that explains the regular relationship holding in pairs of verbs such as *āste* 'he sits' and *āsayati* 'he causes to sit' is a good candidate for a universal lexical operator. Further instances of deverbal causative verbs derived by means of the attachment of the suffix *-aya* include *āpnoti* 'he obtains' ~ *āpayati* 'he causes to obtain' (from √*āp*), *atti* 'he eats' ~ *ādyati* 'he causes to eat, he feeds' (from √*ad*), *padyate* 'he goes' ~ *pādayati* 'he causes to go, he sends' (from √*pad*), etc. (Egenes 2005:222). In the framework of the LSW, lexical causativity realized as in Sanskrit is encoded as a Core operator. The situation in other Indo-European languages, such as Russian, is the same. Russian has pairs of verbs of the type *sadit'* 'to sit' ~ *posadit'* 'to cause to sit', *stavit'* 'stand' ~ *postavit'* 'to cause to stand', etc. (Comrie 1985:310), which provides evidence that the affixes realizing the lexical operator of causativity do not apply recursively and, therefore, this operator has scope over the Core only.

Turning to non-Indo-European languages, transitivity changes and, more specifically, the expression of causativity are often the result of morphological operations and, as such, can be explained by means of the LSW.[11] Davis & Demirdache (2000:100) remark that free roots in St'át'imcets, a Salish language spoken in southwestern interior British Columbia, are invariably intransitive. All transitive verbs are morphologically derived by suffixation of a free or bound transitivizer of the root. This is the case with pairs like √*kwis* 'to fall' ~ √*kwists* 'to drop something', √*t'íq* 'to arrive' ~ √*t'íqs* 'to bring something', *us* 'to get thrown out' ~ *usts* 'to throw out something', etc. (Davis & Demirdache 2000:102). Interestingly, both free and bound forms are used for turning intransitive into transitive verbs, which is in accordance with the unification adopted in the LSW. In the Philippine language Tagalog there are also morphologically encoded

[10] Lexical directionals are non separable. Compare separable particles in the function of Argument-Adjunct, as in Figure 2.

[11] Anticausativity, according to Horvath & Siloni (2010) and Alexiadou (2010), is universal but morphologically unpredictable.

alternations of transitivity like *tumumba* 'fall down' ~ *mpag√tumba* 'knock down', *lumuwas* 'go to the city' ~ *mpag√luwas* 'take to the city' and *sumabog* 'explode' ~ *mpag√sabog* 'scatter'. The examples show that the root *√tumba* may acquire both a meaning of 'fall down' or 'knock down', depending on whether the intransitive infix *-um-* or the transitive prefix *m-pag-* is attached to it (Maclachlan 1989, in Travis 2000:155). The evidence from St'át'imcets and Tagalog coincides with the one furnished from Sanskrit and Russian in two important respects. First of all, causativity is a borderline phenomenon between inflection and derivation in some languages and, consequently, represents an area of application of the LSW. Secondly, causativity is realized by affixes that attach directly to the verbal root, thus having scope over the Core.

The relevance and applicability of further concepts of the LSW can be assessed by concentrating on a single non-Indo-European language, notably if a typological reversal is selected of the main language of analysis and discussion of this article. Pitjantjatjara/Yankunytjatjara (Goddard 1993, Dixon 2002), a language of the Wati family of the South-West group of the Pama-Nyungan type, is suffixal but for a few verbal prefixes with directional function, including *ma-* 'away or outwards movement', *ngalya-* 'in this direction, this way', *para-* 'around' and *wati-* 'across'. The affixes that realize directional lexical operators take up the only available position in the Prefield of the morphological template of Pitjantjatjara/Yankunytjatjara, in which a Post-Nuclear (P-N) slot allows for the insertion of the duplicated element in reduplication, as in *arkai-arkai* 'difficult to see, faint' (adjective > adjective), *ilkaRi-ilkaRi* 'rolling of eyes' (noun > adjective), *iTi-iTini* 'treat as if a baby, spoil, child' (noun > transitive verb), *takal-takal*(*pa*) 'repeated knocking, chopping' (noun > noun) and *waRara-waRara* 'by hopping' (noun > adverb).

Morphological processes of Pitjantjatjara/Yankunytjatjara word-formation other than reduplication include, in the first place, compounding, as in *atatjunanyi* 'do something carefully' (adverb+transitive verb), in which a Periphery is associated with a Word Core in an endocentric construction. Secondly, affixation produces, for instance, intransitive verbs like *kutjuringanyi* 'become single' from adjectives (*kutjutja* 'solitary'). A very productive pattern of affixation is the derivation by means of *tjinga-* of transitive verbs of the *la* (*Ni*) class, as in *ikaritjingaNi* 'make someone laugh'. Thirdly, zero derivation turns out transitive verbs such as *ilaNi* 'to make come closer'. The maximum degree of morphological recursivity is found series like *waRu* 'fire' (basic) ~ *waRu-waRu* 'pushily, roughly, too directly' (reduplication) ~ *waRuly-waRulyi* 'steaming hot' (active adjective > adjective) ~ *waRuly-waRulyinanyi* 'make steaming hot' (adjective > transitive verb). If, as indicated above, reduplication takes up the Post-Nuclear slot, the maximum morphological template of Pitjantjatjara/Yankunytjatjara requires two positions in the Postfield and a single position in the Prefield. This morphological template is in

keeping with the suffixal character of the language, which also determines that the formal position adjacent to the Nucleus belongs to the Postfield. As for directionals, they require one template slot only because they are semantically incompatible with one another.

Pitjantjatjara/Yankunytjatjara has relators coded by means of remarkably regular morphological processes, which strongly resemble inflection as to semantic transparency and generalization in a given category. This is dealt with by the LSW through the relator, a lexical operator that makes reference to the functional definition of lexical categories and establishes the default semantic interpretation of derivatives. In Pitjantjatjara/Yankunytjatjara the relator explains noun > adjective derivations such as the ones producing *ilkaRitja* 'of, from the sky, heaven', *kungkatja* 'of or relating to women', *lirutja* 'associated with snakes' (noun > adjective), etc. The resulting construction belongs to the exocentric type.

Finally, Pitjantjatjara/Yankunytjatjara displays cumulative derivational morphology in derivations by means of the attachment of the suffix *kira*/*Rara*/*ra*, which derives nouns from nouns in such a way that it expresses the inflectional feature of number as well as the derivational feature of kinship, as in *katjaRara* 'a person together with their son' and *kuriRara* 'a person together with their spouse'. The LSW, as I have already pointed out, finds no problem in explaining mismatches form-function like this one. The solution that is adopted comprises an inflectional operator of number and a lexical operator of kinship, both with scope over the Word, the resulting construction being of the endocentric type.

5. Summary and conclusions

This journal article has offered a systematic account of the descriptive-explanatory resources which a structural-functional model of morphology uses in the analysis of inflectional and, mainly, derivational processes. Functional categories may undergo functional adjustment and produce, through linking meaning-form that operates on lexical structures, fully specified words represented by means of the LSW. The tree diagrams that unfold the LSW, in classical terminology, point in the direction of item-and-arrangement morphology, whereas templates go in the line of item-and-process morphology. For linguists of a functional persuasion, templates are the stepwise counterpart of trees, which constitute the monostratal representations adopted by theories such as Functional Grammar or Role and Reference Grammar. To the extent that these theories I have just mentioned acknowledge the weight of the structuralist tradition in their thinking; and given the aim of offering a morphological framework compatible with these functional models of language, I have covered the flank of structural description by using the notions of stepwise derivation and derivational paradigm. Thus, the structural part of

the analysis has provided a view of the vertical axis (paradigmatic), where lexical relatedness can be identified, while the more functionally oriented part of the analysis has been concerned with the horizontal axis (syntagmatic), by means of the identification of hierarchy and dependency relations in the Complex Word, which have been scrutinized both in the top-down and the bottom-up directions. Last, but not least, the Nuclear Shell Principle has been formulated, which stipulates that non-productive derivation recoverable in the diachrony is circumscribed to the Nucleus. This principle explains derivations such as *HRĒOW*: *hrēow*, *hrēow*, *hrēowan*, and, consequently, draws a distinction between productive, synchronic, affixal, word derivation on the one hand, and unproductive, diachronic, zero morpheme, stem derivation, on the other.

The analysis carried out in this journal article has also shown that the research program of word syntax has limits. I have quoted Baker's (2003) remarks on the residue of irregularity in morphology. This has been solved, at least regarding the separation between productivity in the synchrony and recoverability in the diachrony, by means of the Nuclear Shell Principle. More significant limits of word syntax have arisen regarding the syntactic correlate. For a Complex Word such as correlate of the type *bellringestre* 'female bell ringer' to exist in the framework of the LSW it is necessary that there exists a clausal correlate like *someone who rings a bell*, where *who* expresses the First Argument, *rings* the Nucleus and *bell* the Second Argument. This requirement drastically restricts the scope of the Complex Word and, consequently, more research is needed in this area. In spite of this limitation, this article has dealt with both productive and unproductive word-formation processes. On the productive side, I have concentrated on processes that apply regularly if the definitions of the source and target category of the derivation are taken into account, or if the syntactic features inherited from the verbal semantics are considered. On the unproductive side, I have provided a unified explanation for a derivational paradigm in which morphological relatedness is stated both in the synchronic and the diachronic axis.

All in all, the fact that morphology cannot be explained on syntactic grounds exclusively is not a reason for neglecting some interesting points of contact between these domains. This is even more so when some assets of functional theories of language, such as macroroles, layered structures, syntactic templates, linking and adjustment, can be adapted to morphological analysis. Moreover, the discussion in §4 has shown that central concepts and the LSW, such as the layered morphological structure and the morphological template, are applicable to languages genetically and areally unrelated to (Old) English. To round off, the notion of lexical operator, which accounts for regularities in derivational morphology, has been tested against a number of languages and the conclusion can be drawn that lexical negation, modification and causativity, as well as relators, are leading candidates for universal lexical operators.

Appendix

***Hrēowan* in the *Dictionary of Old English Corpus* (tokens given between brackets):**

be**hrēow** (1), be**hrēow**sa (1), be**hrēow**sað (12), be**hrēow**sia (1), be**hrēow**siað (11), be**hrēow**sian (21), be**hrēow**sianne (1), be**hrēow**sie (1), be**hrēow**siendan (2), be**hrēow**siende (2), be**hrēow**siendes (1), be**hrēow**siendne (1), be**hrēow**siendra (1), be**hrēow**siendum (4), be**hrēow**sienne (2), be**hrēow**sigan (1), be**hrēow**sige (12), be**hrēow**sigende (2), be**hrēow**sigendum (4), be**hrēow**sode (6), be**hrēow**sodon (2), be**hrēow**sung (9), be**hrēow**sunga (3), be**hrēow**sungæ (2), be**hrēow**sunge (57), be**hrēow**sygende (1), blod**hrēow**a (1), blod**hrēow**e (1), blod**hrēow**es (2), ge**hrēow** (2), ge**hrēow**að (1), ge**hrēow**an (1), ge**hrēow**e (2), ge**hrēow**eð (3), ge**hrēow**seð (1), gi**hrēow**sadun (1), **hrēow** (15), **hrēow**ð (3), **hrēow**a (1), **hrēow**an (13), **hrēow**cearig (3), **hrēow**cearigum (1), **hrēow**e (61), **hrēow**eð (11), **hrēow**en (3), **hrēow**igas (1), **hrēow**ige (1), **hrēow**igmod (1), **hrēow**igmode (1), **hrēow**lic (3), **hrēow**lican (1), **hrēow**līce (23), **hrēow**licere (2), **hrēow**licum (1), **hrēow**nes (3), **hrēow**nesse (1), **hrēow**nisse (15), **hrēow**nisses (1), **hrēow**nisum (1), **hrēow**nys (2), **hrēow**nysse (1), **hrēow**sað (4), **hrēow**sade (5), **hrēow**seð (2), **hrēow**sedan (1), **hrēow**sedon (1), **hrēow**sende (1), **hrēow**siað (16), **hrēow**sian (15), **hrēow**sianne (1), **hrēow**siendan (5), **hrēow**siende (3), **hrēow**siendne (1), **hrēow**siendum (2), **hrēow**sige (11), **hrēow**sigendan (1), **hrēow**sigende (8), **hrēow**sigenne (1), **hrēow**sode (5), **hrēow**sodon (1), **hrēow**suncge (1), **hrēow**sung (15), **hrēow**sunga (39), **hrēow**sunge (42), **hrēow**um (1), of**hrēow** (11), of**hrēow**ð (2), of**hrēow**eð (1), unbe**hrēow**siendre (1), wæl**hrēow** (24), wæl**hrēow**a (45), wæl**hrēow**an (48), wæl**hrēow**asta (1), wæl**hrēow**e (10), wæl**hrēow**es (1), wæl**hrēow**esta (1), wæl**hrēow**estan (2), wæl**hrēow**lice (24), wæl**hrēow**lices (1), wæl**hrēow**ne (5), wæl**hrēow**nesse (7), wæl**hrēow**nys (1), wæl**hrēow**nysse (17), wæl**hrēow**ra (1), wæl**hrēow**re (2), wæl**hrēow**um (10), wæll**hrēow**e (1), wæll**hrēow**es (1), wæll**hrēow**ne (2), wæll**hrēow**nysse (1), weal**hrēow**e (1), weal**hrēow**esta (1), wel**hrēow**an (3), wel**hrēow**lice (1), wel**hrēow**nysse (1), wel**hrēow**um (1).

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功能構詞法中的投射與構式：以古英文的 *HRĒOW* 爲例

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本文旨在應用字詞分層結構 (Layered Structure of the Word, LSW) 的理論架構來分析古英文 *HRĒOW* 一字的衍生變化，並藉此支持以結構–功能爲主的理論模式如角色指稱語法 (Role and Reference Grammar) 來分析語言結構。雖然一般認爲，構詞分析無法達到完全的規則性，如能以投射及構式來解釋，並結合以橫列 (syntagmatic) 及縱比 (paradigmatic) 的分析來描述，便能夠解釋衍生構詞現象中部分共時的規則性，並對一些不具衍生力的構詞形式有新的看法。就歷時的分析而言，本研究著重在討論，如果將衍生的來源及目標詞類的定義都考慮進去的話便具有規則性的衍生過程。以本研究所採用的理論架構而言，功能性的詞類可以經過功能的調整，並透過作用在詞彙結構上的語意–形式聯結來產生全然特殊化的字詞，這些字詞會由字詞分層結構來呈現。就共時的分析而言，衍生的縱比變化會從共時及歷史的兩個軸向來表示出構詞的關聯性。同時，小核心崁套原則 (Nuclear Shell Principle) 規定，字詞分層結構的小核心 (Nucleus) 將結構不明，不具衍生力，且其生成過程只能從歷時分析中回復的詞幹獨立出來。如此便能區分共時分析中不具衍生力及具有衍生力的過程。本研究也討論字詞分層結構及跨語言分析的相關性，並結論出分層的構詞結構及構詞模板 (morphological template) 可適用於非印歐語系的語言，而詞彙的否定、修飾、使動及關係詞最有可能成爲普遍的詞彙運符 (operators)。

關鍵詞：角色指稱語法，構詞法，字詞生成，構式，古英語