FINDING RELIEF FOR FG LEXICAL REPRESENTATIONS: A SYNTACTIC-SEMANTIC DESCRIPTION OF OLD ENGLISH VERBS OF 'HEALING'[1]

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ABSTRACT

This paper evaluates a new conception of lexical semantic representation as proposed recently within the Functional Lexematic Model. Such evaluation involves a comparison of Functional Grammar's lexical representation with other proposals. In order to avoid some of the weaknesses inherent to both Functional Grammar and other more syntactically-centered descriptions, the concept of lexical template is introduced. In the last section, an analysis of the syntactic-semantic behavior of the subdomain of Old English verbs of 'healing' is carried out in order to demonstrate its applicability.

KEY WORDS: Lexis, lexical templates, logical structures, linking algorithm, Old English.

RESUMEN

Este artículo evalúa una nueva concepción de representación semántica léxica propuesta recientemente dentro del Modelo Lexemático Funcional. Dicha evaluación implica una comparación de la representación léxica de la Gramática Funcional con otras propuestas. Con la intención de evitar algunas de las desventajas inherentes al análisis tanto de la Gramática Funcional como de otros modelos más centrados en la sintaxis, se introducirá el concepto de plantilla léxica. Para demostrar su aplicabilidad, en la última sección, se presenta el análisis llevado a cabo del comportamiento sintáctico-semántico del subdominio de los verbos de 'curar' del inglés antiguo.

PALABRAS CLAVE: Léxico, plantillas léxicas, estructuras lógicas, algoritmos de enlace, inglés antiguo.

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1. INTRODUCTION

A topic of outstanding interest for different linguistic theories nowadays is the explanation —and corresponding codification in the apparatus of a grammar— of the interaction between the semantic structure and the syntactic behavior of lexical units. As a matter of fact, it is possible to assess grammatical models in terms of their potential to account for such connection and the direction in which it takes place (from semantics to syntax, from syntax to semantics or in both directions). If it is postulated that lexical description is the starting point for the configuration of syntactic structures, at least two types of approaches can be distinguished (Levin 1995).

The first one (Fillmore 1968, 1971; Gruber 1976; Jackendoff 1972, 1983), *role-centred approach*, proposes a system of lexical semantic representation based on a list of semantic roles. The use of semantic role labels ideally should account for the distribution and syntactic expression of arguments; one of the main advantages of this approach has been its capability to predict some regularities as it is the association of a preposition with a specific semantic role. However, the ideal of providing a coherent explanation to these factors has given rise to basically two different results, both of them unsatisfactory. The attempt to give one-to-one correspondence between semantic roles and syntactic realizations passes forcefully through a generalization of the definitions of semantic roles, in such a way that they end up devoid of any significance beyond being mere labels for a syntactic expression (something like "the theme is the object of the expression"), which involves losing some differentiations that are necessary to distinguish among some domains; or, quite the contrary, there has been a proliferation of semantic labels to account for the various alternations and/or semantic differentiations exhibited by a class of verbs, thus leaving aside the possibility of accounting for regularities across domains or classes.

The second approach provides lexical representation with the format of semantic decomposition; the origins of this approach can be found in the works of Lakoff (1971), McCawley (1968) or Ross (1972) and is utilized, more recently, by Van Valin and LaPolla (1997), Rappaport and Levin (1998) and Jackendoff (1990), among others. All these proposals account for the meaning of a verb by making use of a set of defining predicates, usually considered as primitives. One frequent criticism to the approach, especially in its first formulations, is similar to one mentioned before: the number of primitives that could be introduced in the description was not constrained, thus weakening the descriptive power of the approach. However, the more recent proposals depart from a closed inventory of Logical Structures (hereafter LS), based mainly in the *Aktionsart* characterization of predicates (cf. Dowty 1979 and Vendler 1967).

From a lexicological perspective, there is another insufficiency in both approaches: none of them accounts for the semantic complexity of the meaning of a lexical unit, since their focus of interest has been only on those aspects of the meaning of a word that have a direct impact in its syntactic behavior.

Another common feature of role —and predicate— centered approaches is their projectionist character: they depart from the assumption that syntactic con-

figurations are the result of a linking process that goes from the lexical description to the grammatical component.

Mairal (2000) adds a third type of approach, whose main feature is the reverse directionality of the connection: constructionist approaches (Goldberg 1995) do not separate the lexicon from the grammatical apparatus, but consider that both of them are part of a continuum where syntactic constructions themselves are endowed with meaning. Goldberg (1995: 9-10) defends that diathetic alternations are better accounted for if the different constructions in which a predicate is used are capable of contributing arguments; thus, in a sentence like

(1) He sneezed the napkin off the table

the verb, which intuitively is considered intransitive, can participate in this structure because the construction provides the caused motion interpretation and the additional arguments. Consequently, the load of syntactic alternations is taken from the lexical entry of the verb. What, in our opinion, is not solved in these approaches is how lexical units and constructions coalesce.

Although projectionist and constructionist approaches seem to hold opposing positions, we could consider them as complementary insofar as they present alternative views of a same process: the projectionist direction of linking, semantics → syntax, seems to correlate with the encoder's perspective, whereas the reverse (syntax → semantics) places the perspective in the decoder's position. Role and Reference Grammar (henceforth RRG) captures this bidirectionality by describing linking as a dual phenomenon, and the design of the model includes both a decompositional system for lexical units and an inventory of syntactic templates.

According to this classification, Functional Grammar (hereafter FG) lies clearly in the group of projectionist theories. Predicates (lexical units) are associated to a predicate frame where matters of valency are codified. There is also a decompositional definition of the semantics of each predicate. This semantic description is heavily constrained by some factors (Dik 1978), among which the condition to avoid metalanguage or primitives is fundamental.

It is striking that predicate frames and Stepwise Lexical Decomposition are kept apart in the description of predicates, and that no interaction among these two elements seems to exist. That is, much of the linkage between semantic structure and syntactic behavior is disposed with in the model.

There are other factors that are problematic within the FG model if attempts are made to relate the semantic and syntactic behavior of predicates; they are the following:

(a) The inefficiency of semantic functions to motivate case or adposition assignment in the expression component. Let's recall, for example, that one of the most common semantic functions for satellites is *Location* which, by itself, does not permit to predict which preposition (*at, on, in, over, below,* etc.) should be introduced by the application of the corresponding expression rule. The

only solution would be to multiply the number of possible semantic functions that express location, which as a counterpart would involve missing the generalization that all the possible satellites are, in fact, of a same coherent type. We must add to this that there would not even be a one-to-one correspondence between semantic functions and prepositions, since the range of meanings associated to prepositional phrases introduced by, for instance, *in* goes far beyond the spatial domain (e.g. *in three hours, in danger,* ...).

(b) The impossibility to establish lexical classes in the Lexicon, since SoAs are determined at the predication level. This is in principle inconsistent with semantic function assignment, since it occurs at predicate level. That is, A_1 function already predicts the inherent parameters of the would-be SoA. Furthermore, the parameter of Telicity has been of fundamental importance to set up lexical classes. However, FG treats Telicity as a contigent feature[2] that is specified beyond the lexical component or *Fund*, which precludes the model from capturing important generalizations such as those described by the so-called Unaccusative Hypothesis (Perlmutter 1978, Burzio 1986, Levin and Rapaport 1995).

2. SEMANTIC DECOMPOSITION AND SYNTACTIC CLASSES

Although the claims posed in Dik (1978) constrained the power of semantic decomposition to the extent of restricting lexical definitions to the task of capturing phenomena of semantic sub/superordination, there is extensive evidence that there is more to say about the meaning of lexical units; as a case in point, Levin (1993) shows that the syntactic alternations exhibited by a vast number of English verbs is better accounted for by integrating in the definition of predicates semantic features that range over several lexical fields. The result is an organization of the lexicon in terms of lexical classes, in a fashion already established by Dowty's (1979) and Vendler's (1967) description of verbal lexemes in terms of a typology of *Aktionsarten*.

Recent developments of the Functional Lexematic Model (henceforth FLM)[3] (Faber and Mairal 1999) have shown that an exhaustive description of the lexicon comprises both types of analysis: lexical units should be grouped in a hierarchical organization where hyponymy relations are central to the description —in line with

[2] The labels inherent/contigent are from De Groot (1989: 40-44), where it is stated that Telicity and Control are contingent features of SoAs since they are not associated to the lexical properties of predicates, but only affect certain arguments or satellites. Telicity would be specifically bound to the Goal argument or to a Directional argument or satellite.

[3] Let's remember that this model came to light in the eighties as an attempt to enrich the FG Lexical component.

the spirit of FG's Stepwise Lexical Decomposition— (Faber and Mairal 1999: 57 and ff.).[4] However, onomasiological structuring is complete only if syntagmatic behavior is codified and connected to semantic structure. This is described in the *Lexical Iconicity Principle* (Faber and Mairal 1999: 187):

> The greater the semantic scope of a lexeme, the greater its syntactic variation.

According to this general rule, the interrelation of syntax and semantics is very close, and a lexical unit's status in the semantic hierarchy is indicative of its syntactic (un)restrictiveness. One of the more interesting advances of the FLM is the efforts to device a definitional system that not only conjoins paradigmatic and syntagmatic information but also accounts for the following issues:

– Why a set of semantically related predicates show a set of systematic syntactic structures and alternations.
– The extent to which syntactic behavior can be predicted from the semantic domain the lexeme is subsumed.
– The extent to which syntactic behavior predicts morphological marking.

It has been already commented that these aspects cannot be accounted for within the scope of FG lexical representations. RRG's lexical representations, on the other hand, concentrate on those aspects of the meaning of a word that explain the syntactic behavior and the set of alternations that a lexical word has.

It is, then, natural to integrate in semantic decomposition a formal device that would account for the appurtenance of predicates to lexical classes that are syntactic-semantically motivated or established. Obviously, this involves a heterodox conception of the FG Lexicon, since some of the axioms established in Dik (1978) are violated, although we contend that it strengthens the explanatory potential of the model.

Lexical description will depart from a LS based on the "modes of action" of predicates. In fact, the inventory adopted corresponds to RRG's semantic description of verbal predicates. According to Van Valin and LaPolla (1997: 109) verbs are classified in terms of the following typology of LS:

VERB CLASS	LOGICAL STRUCTURE
State	**predicate'** (x) or (x,y)
Activity	**do'** (x, [**predicate'** (x) or (x,y)])
Achievement	INGR **predicate'** (x) or (x,y), *or* INGR **do'** (x, [**predicate'** (x) or (x,y)])

[4] One basic organizational principle in the FLM is the *Principle of Lexical Domain Membership* (Faber and Mairal 1999: 87): "Lexical domain membership is determined by the genus, which constitutes the nucleus of the meaning of the lexeme."

Accomplishment	BECOME **predicate'** (x) or (x,y), *or* BECOME **do'** (x, [**predicate'** (x) or (x,y)])
Active accomplishment	**do'** (x, [**predicate$_1$'** (x (y))]) & BECOME **predicate$_2$'** (z, x) or (y)
Causative	α CAUSE β, where α, β are LSs of any type

Note that this kind of description —in which semantic parameters like Telicity or Punctuality come to the foreground— involve a weakening of the power of semantic functions as they don't have any further use. The basic LSs of the verbs of 'healing' in OE are:

(2) BECOME **felan'** (x, y)
(3) [**do'** (x, Ø)] CAUSE [BECOME **felan'** (y, z)]

However, LSs don't sufficiently explain the semantics of a lexical unit:

> participation in one grammatical alternation does not sufficiently determine the semantic class of the verb. In fact, even once a complete cataloguing of participation in alternation classes is achieved, we must ask ourselves just what we have accomplished. (Pustejovsky 1995: 10)

The FLM has devised a definitional system that accommodates both the semantic and syntactic intricacies of a lexical unit into a coherent and unified format. Such system involves the construction of a lexical template for each subdomain which maximizes information and which also constitutes the starting point for the activation of a set of linking rules. The exact nature of the template and the rules will be described in section 4.

3. GUIDELINES FOR A SEMANTICALLY-BASED SYNTACTIC DICTIONARY

The FLM is a lexicological model that has proven its efficiency to account for both the micro and macrostructure of the lexicons of natural languages. Although originally designed as a model that could be a constitutive part of FG, its more recent developments (Faber and Mairal 1999, 2000; Mairal 2000; Cortés and Mairal forthcoming; Cortés and Pérez 2000) have proven its feasibility to incorporate aspects from other models like RRG or Cognitive Grammar.

Lexical representation comprises three major blocks of description, namely, the paradigmatic, the syntagmatic and the cognitive axes. Paradigmatic information is arrived at by applying the principles of Lexematics, in terms of which the vocabulary of a language is organized in a hierarchy of domains and subdomains. The adscription of a lexical unit to a (sub)domain is done by means of a bottom-up procedure: it is definitional structure that determines lexical domain membership. This constitutes a striking difference with other onomasiological approaches, since

more of them establish *a priori* areas of meaning where later lexical units are made to fit. Meaning definitions consist of a *genus* or semantic content shared with the other lexical units of a same (sub)domain and a (set of) *differentia(e) specifica(e)* that marks the range of oppositions that the lexical unit establishes with the rest of members of its (sub)domain, thus signaling its unique semantic characterization and location within the area of meaning. The output of this methodology is an organized structure that has been termed the architecture of the lexicon, where the relations of hyper-/hyponymy are fundamental. In essence, this approach is identical to the procedure of Stepwise Lexical Decomposition proposed by Dik (1978) and was the key to open FG for the FLM proposals. Manner-of-staring verbs would be organized along the following format (Faber and Mairal 1999: 267):

(4) ***stare*** *to look at somebody/something for a long time with wide-open eyes.*
goggle *to stare at somebody/something in surprise.*
gape *to goggle at somebody/something with an open mouth.*
gawk *to stare at somebody/something, in a stupid, unthinking way [informal].*
glare *to stare angrily at somebody/something, in an unfriendly way.*
glover *to glare at somebody/something for a long time.*
ogle *to stare at somebody with sexual interest*

One important restriction in the study of historical lexicons such as Old English (hereafter OE) vocabulary is the impossibility to articulate a completely specific definition for each lexical unit. As Cortés and Mairal (forthcoming) state:

> By combining the information from different lexicographical sources we will be able to group lexical units in terms of their *genus*; it is the level of *differentiae specificae* that seems impossible to determine: a definite ascertainment of sense-relations among lexemes is implausible unless further sources of information are used.

At this stage, the second type of information codified in lexical entries plays a fundamental role. Syntagmatic information will not only express the range of structures where a lexical unit can function but also reveals much of the semantic status of a predicate.

According to the Lexical Iconicity Principle, the interrelation between paradigmatic and syntagmatic information is bi-directional: if a lexical unit shows a greater syntactic variability than another, its semantics would also be less restricted. This is captured in Cortés and Mairal's (forthcoming) *Lexical Iconicity Principle (Beta Reading)*:

> The greater the syntactic coverage of a lexical unit, the higher its position in the semantic hierarchy within a given subdomain.

This is the basic organizational postulate for the so-called FLOED (Functional Lexematic OE Dictionary): the study of OE lexical domains will take syntagmatic information, to a certain extent, to indicate the hypo-/hyperonymic status of lexical units and, therefore, some basic hierarchies will be established within

(sub)domains. In Cortés and Mairal (forthcoming) analysis of the OE subdomain of CHANGE verbs *to (cause something to) become impure/dirty* the following hierarchical strata were identified by applying this principle:

1. smītan
   2. besmītan
      sylian
      (ge)smittian
      begleddian
      3. wīdlian
         (be)smittian
         (ge)unclǣnsian
         4. gemǣlan
            afȳlan
            gefȳlan
            besūtian
            beswylian
            5. fūlian
               solian

In our study, the resulting hierarchy shows a shallower hierarchy:

1.	batian		Accomplishment /Causative Accomplishment
	gelācni(g)an		
	lācnian		
	līðegian (-igian)		
	2a.	ācofrian	Accomplishment (1/2 arguments)
		gebatian	
		getrymman	
		gewyrpan	
		smēð(i)an	
		3a. geedwyrpan	Accomplishment (1 argument)
		trumian	
	2b.	gebētan	Causative Accomplishment
		gelīðian	
		gesmēðan	
		gestrangian	
		getilian	
		getemprian	
		līðan	
		līþian	
		trymman,	
	2c.	gehǣlan	Causative Accomplishment (Result)
		hālian	Accomplishment (Result) (1/2 arguments)
		3c. þurhǣlan	Accomplishment (Result) (1 argument)

The third parameter for analysis is the so-called cognitive axis: the interaction of semantic and syntactic information yields also a structure that shares many similarities with Lakoff's (1987) idealized cognitive models and Langacker's (1987, 1991) cognitive domains. Such structure has been termed a predicate schema[5] and can be defined as the linguistic means used by speakers to categorize reality. Predicate schemata are dynamic in nature as they are adapted to account for new events and experiences. Such adaptation processes are usually metaphorical projections from one source domain to another target domain. The impact of metaphor leads lexical units to be transferred from one semantic area to another, which in turn usually correlates with some variations in the syntactic structure, especially as far as the selection restrictions of the arguments is concerned. The impact of metaphor in the configuration of the subdomain of OE FEELING verbs "to (cause to) feel physically better (healthy)" is part of the analysis presented in section 4.

4. ANALYSIS OF THE OLD ENGLISH VERBAL SUBDOMAIN "TO (CAUSE TO) FEEL PHYSICALLY BETTER (HEALTHY)"

This section exploits the potential of the Lexical Iconicity Principle (Beta Reading) and of the new proposal of lexical decomposition described in the previous sections for the semantic structuring of a lexical (sub)domain. An attempt will be also made to link the various syntactic structures in which the lexical units that constitute a semantic subdomain participate to their common semantic representation. The verbs chosen conform an overlapping zone between two lexical domains of OE verbs: the one of the verbs of feeling and that of verbal predicates denoting change of state.

This group of verbs has a "signification core" that can be described in the following terms: all of them designate a spontaneous or induced change of a painful physical condition so that the entity affected by such a condition will feel better and, eventually, recover. This description is, in fact, a complex semantic scenario that involves the transition from one state to another, which are evaluated as being bad and good, respectively. Such axiological load would transcend the mere physiological symptoms to involve an emotional evaluation on the part of the speaker with regard to the entity undergoing such transition. It is because of all these subsidiary factors that there are many verbs that do not strictly belong to this subdomain but that can participate in the verbalization of such states. Thus, many verbs of change —*gōdian, beōtian, hnescian,* etc— which would not strictly mean to "cure" or "heal" can be used to describe such processes. For instance:

(5) Ðonne gōdiaþ ðæra lendena sār and ðæra þeōna swȳðe hræðe (Herb. 1, 28)

[5] Lexical templates are actually a formalized version of predicate schemata.

There are also verbs from other areas of meaning that are metaphorically projected onto the domain of "curing"; such is the case of verbs like *(ge)līhtan, tolǣtan* or *tōslupan* whose meaning is "to alleviate, calm, relieve, mitigate." For example:

(6) Đæt stilþ đam sāre (Lchdm. ii. 60, 5)

The metaphor underlying these expressions is AN ILLNESS IS A BURDEN; that is, all actions that involve discharging an entity from a burden can be taken to describe the transition from illness to a healthy condition. Given that actions very often involve movement there are also cases where verbs from the field of movement, such as *(a)cwician, geedcwician, tōlȳsan,* or *gedīgan* can be used to refer to contexts of healing processes.[6] For example:

(7) His cealdan limu geedcucodon (Hml. Th. i. 534-535)

We will focus the remainder of our description on the verbs whose denotation corresponds with the core meaning described above, and assume that the lexemes that conform their meaning to such core signification also adapt their syntactic behavior. Then, our analysis will deal with the following units: *ācofrian, batian, gebatian, gebētan, geedwyrpan, gehǣlan, gelācni(g)an, gelīđian, gesmēđan, gestrangian, getilian, getemprian, getrymman, gewyrpan, hālian, lācnian, līđan, līđegian (-igian), līþian, smēđ(i)an, trumian, trymman, þurhǣlan* (see Appendix).

As was mentioned in the previous section, one important restriction on the reconstruction of the meaning of historical vocabulary is the impossibility of providing a fully-fledged semantic characterization for every lexical unit and, consequently, a detailed lexical architecture of domains cannot be obtained. The proposal in the FLM is, then, to start from the syntagmatic axis of description since there is a bi-directional correspondence between semantic and syntactic information; that is what is expressed in the *Principle of Lexical Iconicity (Alpha and Beta Readings)*.

A logical corollary from this correspondence is that the semantic scenario of a (sub)domain delimits also the syntactic territory where the combinatorial behavior of predicates finds explanation. As a matter of fact, in a recent proposal (Faber and Mairal 2000) the FLM has opted for a design of a lexical template for each (sub)domain that maximizes syntactic-semantic information and constitutes the initial stage of linking mechanisms. Thus, the lexical template corresponding to the OE verbs of 'healing' is as follows:

[6] As can be observed, these conceptual projections are not exclusive of OE; they pervade the vocabulary of different languages, such as Spanish, French and Contemporary English.

[**do'** (w, [**use.medicine** (α)' (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **feel'** (y, [**physically.better** (β) **about.** (γ)' (y_i, z)])]) ∧ [**be'** (y, [**healthy'**])]]
α = x; β = y_i; γ = z

The representation includes an effector (w) that carries out an activity of healing upon a patient (y) applying a medicine (x) on the patient, and consequently the affected entity experiences a new state, that of feeling better which, as a result, would be a state of health. In more detailed terms we could say that an effector (w) uses a medicine (x) in such a way that it will be located at, in or on a patient (y), which causes an event such that (x) makes (y) experience a change in itself (y_i) or —more specifically— on the diseased part (z) of itself, and this makes (y) be healthy.

This representation, which encodes the syntactic-semantic scenario of the verbs of 'healing', contains two types of variables: Roman letters represent external variables, and will have a syntactic realization; internal variables are marked by Greek letters and their main function is to represent the ontological constants that characterize the lexical class.

As Faber and Mairal (2000) comment, this type of lexical representation would in principle violate the *Completeness Constraint* (Van Valin and LaPolla 1997: 325) since not all its elements will be syntactically realized. They argue, however, that this constraint must be applied only to external argument positions; the rest of the components —the internal argument variables, the primitives (expressed in boldface) and the operators (in capitals) that form part of the semantic decomposition— will not be affected by such a condition.

One important advantage of the FLM's lexical templates is that they are more constrained than other types of lexical decomposition that integrate primitives and concentrate only on those elements that would have syntactic import. As a case in point, Rappaport and Levin's (1998) LSs, although apparently more economical, run the risk of not being sufficiently restrictive. Their condition of *Template Augmentation*[7] does not impose any real limit to the number of times that a given LS can be increased.

Lexical Templates, on the other hand, are conditioned by the following requirement (Faber and Mairal 2000):

> *Lexical Template Modelling Process*
> Lexical templates can be modelled by suppressing variables, instantiating internal variables, eliminating operators (e.g. CAUSE), or else, by introducing elements resulting from the fusion with other templates.

[7] Lexical Template Augmentation:
Event structure templates may be freely augmented up to other possible templates in the basic inventory of event structure templates. (Rappaport and Levin 1998: 111)

According to this process, the mapping between the lexical representation (the template) and the syntactic behavior of the lexical units that belong to a same class is done through several processes of reduction.[8]

We will now turn to explain how some of the alternations exhibited in the behavior of the OE verbs of 'healing' obtain from the lexical template.

All the verbs of this subdomain focalize on the resultative part of the chain of events codified in the template, what is expressed after the operator CAUSE; this accomplishment reading would have in its minimal expression the following structure:

(8) BECOME **feel'** (y, [**physically.better** (β) **about.** (γ)'])

In these occasions the verbs usually take one single argument, as is the case of *geedwyrpan* in the following sentence:

(9) Sōna swā hȳ geedwyrpte beōđ and gestrangode (R. Ben. 61, 2)

The structure corresponding to this case would, then, be the following:

(10) BECOME **fēlan'** (hȳ, [**geedwyrped'**])

As can be noticed, the internal variables (β) and (γ) are not syntactically realized. However, there are some instances where reflexivization of the (y) argument takes place; this is expressed in the template by a (y_i) variable, which appears co-indexed with the patient argument, and which is the expression of the internal variable (β); for instance, the sentence:

(11) þā getrymede ic mē and gestrangod wæs (Bd. 5, 6)

is represented as follows:

(12) BECOME **fēlan'** (ic, [**getry(m)med'** ($mē_i$)])

There is also the possibility of giving overt expression to (γ), if reference is made to the part of the patient that undergoes the change, as in (13) and (14):

(13) He þǣre ealdan untrumnesse getrymed wæs (Bd. 5, 5)
(14) Đonne hālaþ đæt heafod swȳđe hrađe (Herb. I, 2)

[8] Note that this approach lies closer to the proposal of Construction Grammar (Goldberg 1995) where some of the elements in the lexical representation may not find expression in a given syntactic structure. For instance, the verb *mail* has three participant roles, but only two of them are lexically profiled (represented in boldface) (cf. Goldberg 1995: 53): send <**mailer mailed** mailee>; thus *mail* can appear in constructions with only two participants, as in *Paul mailed the letter*.

The corresponding structures are:

(15) BECOME **fēlan'** (Ø, [**getry(m)med'** (þǣre ealdan untrumnesse)])
(16) [BECOME **fēlan'** (Ø, [**physically.better** (β) **about.** (γ)' (đæt heafod)])] ∧ [**be'** (Ø, [**gehālod'**])]

There is also the possibility of both (β) and (γ) to be expressed in the same construction:

(17) Ecbyrht hine đære ādle getrymede (Bd. 3, 27)

and therefore both (y) and (z) must be present in the representation:

(18) BECOME **fēlan'** (Ecbyrht, [**getry(m)med'** ($hine_i$, đære ādle)])

Although a fine-grained semantic description for every OE verb requires further research,[9] our study has already revealed some interesting semantic distinctions; such is the case of the verbs *hālian, þurhælan* and *gehælan*:

(19) Hē ongan trumian and hāligean (Bd. 4, 22)
(20) 'We lācndon Babylōn, and hiō đeāh ne wearđ gehæled'. Đonne biđ Babylōn gelācnad, nalles đeāh fullīce gehæled... (Past. 267, 9)

In most cases the effected state implied by the accomplishment reading of the majority of verbs of 'healing' is not necessarily preserved, since it has no further syntactic impact. This happens with most verbs in the subdomain and, therefore, such an effect must be considered a logical entailment of the accomplishment use of these predicates, without an expression in the lexical entries of the lexemes. The representation of the verbs would then be as follows:

(21) BECOME **feel'** (y, [**physically.better** (β) **about.** (γ)' (y_i, z)])

Nevertheless, there are cases where the entailment is cancelled out: the verb involves a change of state by which the patient will feel better, but the effected state of healthiness is not (yet) arrived at. This has some impact on the expressions, either by having to add some lexical material, as an adverbial modifier that marks lexically the degree of recovery, thus concentrating semantically on the durative aspectuality of the accomplishments:

[9] This study has been based on lexicographical sources, e.g. Bosworth-Toller (1972), Toller (1973), Hall (1996) and Pollington's (1993) dictionaries. A more detailed account should be provided by including data from the extensive use of corpora (such as the Concordance Corpus of OE by Venezky and Di Paolo 1980).

(22) Se fisc ... swā hine swīðor ðā ȳða wealcað, swā hē strengra bið and swīðor batað (Hml.Th.i.250, 18)

or by expressing the difference between the durative and the resultative phases of the process of healing as in the examples (19) and (20). This leads us to consider that in the case of *hālian, þurhālan* and *gehælan*, the effect of the event cannot be considered as an entailment, it is rather an assertion and, as such, would have to be codified in the lexical entry:

(23) ***gehælan***
[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)'])]) ∧ [**be'** (y, [**gehæled'**])]]
(24) ***hālian***
[BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)'])] ∧ [**be'** (y, [**gehālod'**])]
(25) ***þurhælan***
[BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)'])] ∧ [**be'** (y, [**þurhæled'**])]

The second LS that results from the *Modeling Process* when it is applied to our subdomain is the following one:

(26) [**do'** (w, [**use.medicine** (α)' (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **feel'** (y, [**physically.better** (β) **about.** (γ)' (y_i, z)])])]

This LS captures a causative alternation of accomplishments. The causative parameter activates a frame which marks a relation between a causer effecting a change on an entity that therefore experiences such a change. As shall be seen later, it is not uncommon to express the means used by the effector to carry out the change. What marks the difference between these induced changes of state and non-causative accomplishments is the obligatorily transitive behavior of the first. As has been commented before, in the case of non-causative accomplishments their default structure is intransitive, unless a reference is made either to the diseased part of the patient or to the patient as a reflexivized constituent in accusative or dative case.

One prototypical example of a causative accomplishment construction is:

(27) Gelācna ðū hȳ (Hy. I, 5)
(28) [**do'** (ðū, [**use'** (ðū, Ø)]) ∧ BECOME **be-loc'** (Ø, Ø)] CAUSE [**do'** (Ø, [BECOME **fēlan'** (hȳ, [**gelācnod'**])])]

As was mentioned in the preceding sections, one of the weaknesses of FG predicate frames is their insufficiency to motivate syntactic and morphological behavior. In order to overcome these shortcomings the FLM has proposed a system of representation in terms of lexical templates that constitute the first part of lexical grammars. The other element of lexical domain grammars is a set of rules that link the semantic representations with the morpho-syntactic constructions

where the predicates participate. The remainder of this section will tackle this issue, especially the question of case and adposition assignment will be considered.

In RRG, the notion of *macrorole* is fundamental to predict the transitivity of the verb and case marking of the arguments. Van Valin and LaPolla (1997: 139) define semantic macroroles in the following terms:

> Macroroles are generalizations across the argument-types found with particular verbs which have significant grammatical consequences; it is they, rather than specific arguments in logical structure, that grammatical rules refer to primarily.[10]

Two macroroles are distinguished in RRG: Actor, the generalized Agent-type role, and Undergoer, the generalized Patient-type role. Their assignment is described as a continuum of increasing markedness in terms of the different types of LSs (Van Valin and LaPolla 1997: 146):

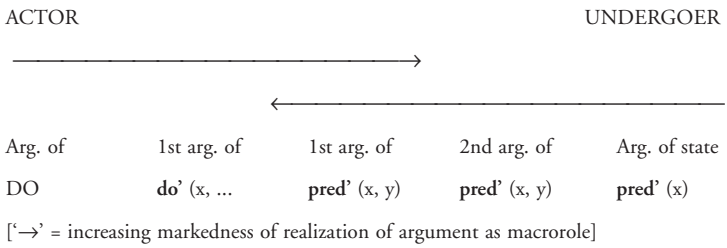

Figure 1. The Actor-Undergoer Hierarchy

Then, the arguments in our LSs would receive the following assignments:

(A) In the case of accomplishments with only one argument, it will receive the mark of Undergoer [U], since it forms part of a state predicate. E.g.:

(29) Ic gelācnige (Ælfr. Gr. 27)
(30) BECOME **fēlan'** (ic_U, [**gelācnod'**])

[10] One important consequence of this definition is that semantic functions are not operative within a grammar. They are mere mnemonic traces of a word's semantic participants. In fact, it is customary both in RRG's and Rappaport and Levin's (1998) LSs not to mention the semantic functions of the arguments.

There are occasions in which the only argument is not necessarily the patient; thus in:

(31) Wunda opene raþe ācofriað, belocene þearle wundiað (Scint. 40,12)

where the (y) is not saturated lexically; the structure is:

(32) BECOME **fēlan'** (Ø, [**ācofrod'** (wunda opene$_{U}$)])

(B) When accomplishments have more than one argument, again the constructions are Macrorole-intransitive, since only U-assignment takes place, the "Other" argument appearing in Dative:

(33) He þǣre ealdan untrumnesse getrymed wæs (Bd. 5, 5)
(34) BECOME **fēlan'** (he$_{U}$, [**getry(m)med'** (þǣre ealdan untrumnesse)])

with a locative adposition:

(35) Sōna ðæt him bet wæs, and gewyrpte fram ðǣre untrumnysse (Bd. 3, 13)
(36) BECOME **fēlan'** (he$_{U}$, [**gewyrped.fram'** (ðǣre untrumnysse)])

or with a reflexive pronoun, co-referential with the Undergoer:

(37) He hyne gewyrpte, ðeāh ðe him wund hrine (Beo. Th. 5944)
(38) BECOME **fēlan'** (he$_{U}$, [**gewyrped'** (hyne)])

(C) As regards causative accomplishments, whose basic structure encodes two arguments:

(39) [**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gestrangod'**])])]
(40) He$_{A}$ gestrangode hī$_{U}$ (Bd. I, 23)

the unmarked option for Actor is the effector (he$_{Nom}$), being the argument (hī$_{Acc}$) the unmarked option for Undergoer, as can be inferred from the Actor-Undergoer Hierarchy. Therefore, the verb in this case has a transitivity of [2], in opposition to the non-causative accomplishments whose Macrorole-transitivity is [1].

There are constructions with a participant that encodes the instrument used by the effector to carry out the action that will bring about the change of state. Consider the example:

(41) Lǣcecynn þe$_{A.Nom}$ mid wyrtum$_{Dat}$ wunde$_{U.Acc}$ gehǣlde (Rä. 6, 12)

whose corresponding LS is:

(42) [**do'** (Lǣcecynn, [**use'** (Lǣcecynn, wyrtum)]) ∧ BECOME **be-loc'** (Ø, wyrtum)] CAUSE [**do'** (wyrtum, [BECOME **fēlan'** (Ø, [**physically.better** (β) **about.** (γ)' (wunde)])]) ∧ [**be'** (Ø, [**gehǣled'**])]]

There are two effectors in this LS, the animate *Lǣcecynn* and the inanimate *wyrtum*, which is also an implement, and both are potential actors according to the Actor-Undergoer Hierarchy. When there are two effectors, the first one in the causal chain becomes Actor. In (41) *Lǣcecynn* corresponds to the (w) argument and *wyrtum* to (x), and therefore *Lǣcecynn* is the first argument in the causal chain and functions as Actor, receiving thus nominative case. *Wyrtum*, on the other hand, is not selected for Undergoer either, as *wunde* outranks it with respect to the Undergoer pole of the Hierarchy (that is why it appears in accusative), and accordingly it will be realized as a non-macrorole core argument and is marked by *mid* plus dative.

There is another possibility to mark in OE the non-macrorole instrumental argument: it can appear with instrumental marking:

(43) Đæt gē him sāra gehwylc hondum$_{\text{Instr}}$ gehǣlde (Exon. 42b)[11]

If the first argument of the LS were left unspecified, the next candidate to function as subject and receive the nominative case would be the instrument argument since it would be the effector of the LS of **do'**; this is indeed the case in the sentence:

(44) Gāte cȳse niwe ongelegd đæt sār gelīđegaþ (Med. ex Quadr. 6, 7)
(45) [**do'** (Ø, [**use'** (Ø, Gāte cȳse niwe ongelegd)]) ∧ BECOME **be-loc'** (Ø, Gāte cȳse niwe ongelegd)] CAUSE [**do'** (Gāte cȳse niwe ongelegd, [BECOME **fēlan'** (Ø, [**gelīđod'** (dæt sār)])])]

this structure reads as follows (cf. Van Valin and LaPolla 1997: 121):

The causing event in (45) is complex, and the instrument argument appears three times in the LS: as the implement of **use'** and as the effector of **do'** (Gāte cȳse niwe ongelegd, [BECOME **fēlan'** (Ø, [**gelīđod'** (đæt sār)])]). It is possible, since the first argument of the highest **do'** is left unspecified, to say *Gāte cȳse niwe ongelegd đæt sār gelīđegaþ*, with the instrument *Gāte cȳse niwe ongelegd* as Actor, being consequently marked with nominative case.

4. CONCLUSIONS

The introduction of a new system of lexical representations, even though it means violating some basic axioms of FG's lexical description, seems to offer a viable solution to several of the weaknesses of the lexical component of Dik's gram-

[11] Note that dative case marks the patient entity *him*. Instruments can also appear as adjuncts introduced by other prepositions, as in:

Gif hit nelle *for þisum lǣcedōme*$_{\text{Dat}}$ batian (Lch. ii. 354, 9).

mar. In special, lexical templates bridge the gap between the semantics of predicates and their syntactic behaviour, as they motivate the introduction of linking mechanisms that would explain much of the final expression of underlying structures. As regards the FLM, the application of the Lexical Iconicity Principle —in its Beta interpretation— helps to circumvent some of the problems inherent to the analysis of historical lexicons. Nevertheless, it is necessary to do a more extensive study —both in larger areas of the lexicon and with extensive data from corpora— to assess in more proper terms the potential of this novel approach.

APPENDIX

Old English Verbs of 'Healing'

"to (cause to) feel physically better (healthy)"

Lexical Template

[**do'** (w, [**use.medicine** (α)' (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **feel'** (y, [**physically.better** (β) **about.** (γ)' (y_i, z)])]) ∧ [**be'** (y, [**healthy'**])]]

α = x; β = y_i; γ = z

ācofrian

BECOME **fēlan'** (y, [**ācofrod'** (z)])

Wunda opene raþe ācofriað, belocene þearle wundiað (Scint. 40,12)

batian

BECOME **fēlan'** (y, [**gebatod'**])

Bataþ he inneweard (Lch. i. 80, 20)

BECOME **fēlan'** (y, [**gebatod'** (z)])

Lege on þǣr hit heardige, hnescaþ hyt sōna and bataþ (Lch. i. 84, 4)

BECOME **fēlan'** (y, [**gebatod'** (y_i, z)])

Ne mæg $him_{Dat.}$ se līchoma batian (Lch. ii. 206, 10)

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gebatod'**])])]

Gif hit nelle for þisum lǣcedōme$_{Dat.}$ batian (Lch. ii. 354, 9)

gebatian

BECOME **fēlan'** (y, [**gebatod'** (z)])

Tō gehwylcum bryce..., þonne byþ hyt fæste gebatod (Lch. i. 370, 20)

gebētan

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gebētt/gebēted** (z)])])]

þ sār hyt wel gebēt (Lch. i. 200, 6)

geedwyrpan

BECOME **fēlan'** (y, [**geedwyrped'**])
Đā æt nȳhstan onfēng he gāste and wearþ geedwyrped (Bd. 4, 22)
Sōna swā hȳ geedwyrpte beōđ and gestrangode (R. Ben. 61, 2)

gehælan

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)')])] ∧ [**be'** (y, [**gehæled'**])]]
[...] and hē nænne gehælan ne mæg, būton hē hine ærest āwyrde. (Wlfst. 97, 10-18)
þū gehældest mīne ādla (Bl. H. 89, 3)
'We lācndon Babylōn, and hiō đeāh ne wearđ gehæled'. Đonne biđ Babylōn gelācnad, nalles đeāh fullīce gehæled... (Past. 267, 9)
Đæt gē him sāra gehwylc hondum$_{Instr.}$ gehælde (Exon. 42b)
Lǣcecynn þe mid wyrtum$_{Dat.}$ wunde gehælde (Rä. 6, 12)

gelācni(g)an

BECOME **fēlan'** (y, [**gelācnod'**])
Ic gelācnige (Ælfr. Gr. 27)
Gif hine mon gelācnian mæge (L. Alf. pol. 69)

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gelācnod'** (z)])])]
His sāwle wunda dǣdbētende gelācnian (Homl. Th. i. 124, 14)

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gelācnod'**])]
Gelācna đū hȳ (Hy. I, 5)

gelīđian, -līđegian

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gelīđod'** (z)])])]
Styrunge ȳþa hire đū gelīđegast (Ps. Lamb. 88, 10)
Đū gelīđegodest ealne đīnne graman (Ps. Lamb. 84, 4)
Gāte cȳse niwe ongelegd đæt sār gelīđegaþ (Med. ex Quadr. 6, 7)

gesmēđan

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gesmēđēđ** (z)])])]
Se ele gesmēđ đa wunda (Past. 17, 10)

gestrangian

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gestrangod'**])])]
He gestrangode hī (Bd. I, 23)
Wundorlīce þeōs wyrt gestrangađ (Lch. i. 134, 5)

getilian

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y$_{Genitive}$, [**getilod'**])])]
Sceal se gesceādwīsa lǣce lǣtan ǣr weaxan đone lǣssan and tilian đæs māran... būton hē bēgra ætgæddre getilian mæge (Past. 457, 15)

getemprian

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**getemprod'** (z)])])]
Mōt se đe wile mid sōæum lǣcecræfte his līchaman getemprian (Homl. Th. ii. 474, 35)

getrymman

BECOME **fēlan'** (y, [**getry(m)med'** ((y_i), (z))])
Ecbyrht hine đære ādle getrymede (Bd. 3, 27)
He þǣre ealdan untrumnesse getrymed wæs (Bd. 5, 5)
þā getrymede ic mē and gestrangod wæs (Bd. 5, 6)

gewyrpan

BECOME **fēlan'** (y, [**gewyrped'** ((y_i), (z))])
Hē hine þǣre seōcnysse gewyrpte (B. 2976)
Sōna đæt him bet wæs, and gewyrpte fram đǣre untrumnysse (Bd. 3, 13)
He hyne gewyrpte, đeāh đe him wund hrine (Beo. Th. 5944)
Godwine gesīclode and eft gewyrpte (Chr. 1052)

hālian

[BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)'])] ∧ [**be'** (y, [**gehālod'**])]
Hē ongan trumian and hāligean (Bd. 4, 22)

[BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)' (z)])] ∧ [**be'** (y, [**gehālod'**])]
Đonne hālaþ đæt heafod swȳđe hrađe (Herb. I, 2)
Lege on þā wunde; þonne hālađ heō sōna (Lch. i. 88, 23)

lācnian

BECOME **fēlan'** (y, [**gelācnod'**])
Ic lācnige (Ælfc. Gr. 33)
Cymeþ and lēcnigaþ (Lk. Skt. Rush. 13, 14)

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gelācnod'** (z)])])]
Ne đa wanhālan gē ne lācnedon (L. Ecg. P. iii. 16)
Lā lēce lēcna đec solfne (Lk. Skt. Rush. 4, 23)
Đonne sceal man mid cealdum lǣcedōmum lācnian (L.M. I, I)
Lācnod wæs fram his wundum (Bd. 4, 16)
Freōnd đe his gȳmenne dyde and his wunda lācnian wolde (Bd. 4, 22)

līđan

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**geliđen'**])])]
Đæt se hiē līđe and hǣle (Past. 17, 10)

līđegian, -igian

BECOME **fēlan'** (y, [**gelīđegod'**])
Đæt đū līđegie (Ps. Spl. 93, 13)

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**gelīđegod'** (z)])])]
Gewylc ȳđa his đū līđegast (Ps. Spl. 88, 10)

liþian

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**geliðod'** (z)])])]

Biþ ðæs innoþes sār līðigende ðæt hit sōna nænig lað ne biþ (Herb. I, II)

smēð(i)an

[BECOME **fēlan'** (y, [**gesmēðod** ' (z)])

Ðonne smēðaþ dæt neb and hālaþ (Lchdm. i. 86, 8)

trumian

BECOME **fēlan'** (y, [**getrumod** '])

Hine gestōd sumu umtrymnis... sōna swā hē trumian ongan (Bd. 4, I)

trymman

[**do'** (w, [**use'** (w, x)]) ∧ BECOME **be-loc'** (y, x)] CAUSE [**do'** (x, [BECOME **fēlan'** (y, [**getrymed'** (z)])])]

Onlagen tō trymmanne ðone magan and tō bindanne æfter ūtsihtan (Lchdm. ii. 180, 24)

þurhælan

[BECOME **fēlan'** (y, [**physically.better** (β) **about.** (γ)'])] ∧ [**be'** (y, [**þurhæled'**])]

Ealle ða þincg, ðe on ðæs mannes līchoman tō lāðe ācennede beōþ, heō ðurhæleþ (Lchdum. i. 124,22)

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