New Perspectives on Argument Structure in Functional Grammar

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edited by

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Contents

Introduction

Since Dik (1978), Functional Grammar (FG) has undergone a number of substantial modifications. Many of the refinements of the theory have been oriented towards enriching the structure of the clause by giving it a multi-layered dimension (Dik [1989] 1997a, 1997b; Hengeveld 1989), as well as providing an in-depth account of pragmatic functions (Connolly et. al. 1997). A great effort has also been made to elaborate higher units of description at the discourse level (Hengeveld 1997, to appear; Kroon 1997). However, other aspects of the theory such as expression rules, the internal structure of the lexicon, and the syntax-semantics interface have not received the attention they evidently deserve, notable exceptions being Bakker (1999, 2001) and Olbertz et. al. (1998) for the expression rule component and the internal structure of the lexicon, respectively.

The FG lexical component – the Fund – consists of a lexicon, a set of predicate formation rules, which account for derivational processes, and a set of term formation rules. In the lexicon, each basic predicate is represented in the form of a predicate frame, which also contains some specification of the meaning of the predicate. The predicate frame is conceived of as a construct that plays a vital role in the construction of underlying predications and in the instruction of the expression rule component to produce the appropriate output.

J. Lachlan Mackenzie, starting from a discourse perspective, offers a complete account of the role of predicate frames in the existing theory. The author also evaluates other types of research that constitute a radical reformulation of the very notion of predicate frame. This results in a complete picture of the state of the art in argument structure representation in FG. He also touches upon other controversial issues within the theory, such as the status of Predicate Formation Rules.

Against this general background, this volume investigates a number of possible innovations within the lexical component of FG.

These innovations have to do with the interaction of meaning definitions with their corresponding predicates and with the possibility of constructing meaning definitions on the basis of an abstract metalanguage. These two theoretical topics are the leading issues of Ricardo Mairal Usón and Pamela Faber's key article in this volume, and in fact they also constitute the background against which the rest of the papers have been written. A reconsideration of the predicate frame in these two areas eventually leads to the formulation of a new design for the syntax-semantics interface in FG, which is much more in consonance with the theoretical underpinnings of a functional theory.

In connection with this, it is important to note that the key paper – as well as most papers in the volume – heavily bears upon insights from Role and Reference Grammar (RRG – Van Valin and LaPolla 1997). This theoretical move seems to be in consonance with the fact that both models are regarded as moderate functional approaches, and share many theoretical premises in a number of specific points, viz. the adoption of a layered structure model for clause analysis. More particularly, one of the leading thesis is that the metalanguage posited in RRG logical structures can enrich the format of the predicate frame. Furthermore, logical structures unify into one compact, single representation both the semantic and the syntactic distinctive parameters of each predicate. However, what RRG is almost silent about concerns the development of a further semantic decompositional system of the primitives that form part of the lexical representation. In this sense, the inclusion of the semantic analysis done in the framework of the Functional Lexematic Model (which is a further development of the standard FG view) in the inventory of RRG logical structures constitutes the central point of departure of the key paper in this volume.

Ricardo Mairal Usón and Pamela Faber argue in their paper for a new system of representation, the *lexical template*, which conflates both syntactic and semantic information into one unified representation; hence the predicate frame and its corresponding meaning definition are no longer conceived of as two separate modules but as one unified representation. This theoretical move is a radical departure from the orthodox FG view. The authors, drawing on previous work

on the lexicon and its division into articulated semantic classes (Faber and Mairal 1999), argue that each lexical class is characterized by a lexical template, a theoretical construct which contains the basic conceptual parameters shared by all the verbs belonging to a lexical class. The twofold division into internal and external variables allows the representation of the full set of regularities within a lexical class into one unified representation. The authors proceed to discuss how to account for syntactic variation within the same lexical class without having to postulate a different entry for each complementation structure. They claim that syntactic variation can be explained by modeling processes which operate upon the canonical lexical template through the application of lexical rules which relate lexical entries to their corresponding complement configurations. A lexical template is posited for the lexical class of *manner-of-cutting* verbs, and the alternations typical of these predicates are analyzed with respect to the maximal canonical template. However, as the authors conclude, an issue for further research concerns the description of the inventory of lexical rules, as well as the actual format of the fusion processes involved.

From a more syntactically-driven perspective, Daniel García Velasco and Kees Hengeveld introduce the notion of *predication frame*, which replaces the notion of predicate frame with a view to making the theory more adequate psychologically, pragmatically, and typologically. The authors claim that predicate frames should be replaced by predicates and frames, the former corresponding to lexemes and the latter to the aforementioned predication frames. They suggest that a mechanism should be posited to link the two in the grammar. Predication frames represent the full range of underlying configurations in which a lexeme can be inserted. Lexemes, which are represented in the Fund, are provided with an abstract meaning definition which, in turn, serves to anchor each lexeme to its appropriate predication frame. Thus, a speaker selects a particular predication frame and then he/she chooses an appropriate lexeme, a process which is guided by the conceptual information encoded in lexemes. Like Mairal Usón and Faber, these authors agree that syntactic alter-

nations are better not accounted for by predicate formation rules, but rather by lexeme derivation rules.

Without questioning the validity of the notion of predicate frame and the epistemological nature of meaning definitions, Dik Bakker and Anna Siewierska, drawing on their dynamic version of the expression rule component, address the issue of the syntax-semantics interface in FG. They reconsider the type of material which should be stored in the lexicon and provide a detailed discussion of the status of adpositions in an FG grammar from both a diachronic and a typological perspective. They provide evidence that some types of adpositions should be treated as predicates. A new conception of the predicate is posited within the larger framework of the lexicon, underlying representation and expression such that the inventory of expression rules can produce the appropriate output. This paper thus sheds new light on the status of expression rules, which are vital in the design of a powerful linking algorithm.

In Mairal Usón and Faber's paper, a strong claim is made towards the use of an ontology as a device for further semantic decomposition of the set of constants which permeate a lexical template. Antonio Moreno Ortiz and Chantal Pérez Hernández, drawing on work in Ontological Semantics and more particularly on the Mikrokosmos ontology, explore the kind of impact that the incorporation of a language-independent ontology of concepts would have on an FG lexicon organized in terms of a hierarchy of lexical templates, and proceed to provide a detailed account of the way both internal and external variables can be further decomposed semantically by anchoring these to an ontology of concepts. Moreover, as the authors claim, this type of endeavor turns out to be very helpful in the study of ontology and of acquisition of the lexicon.

Within the realms of morphology, Francisco J. Cortés Rodríguez and María Jesús Pérez Quintero present an alternative account of agent nominalizations in terms of the notion of lexical template as formulated in the key article. These authors argue against the use of predicate formation rules for lexical creation since it is highly questionable whether a single predicate formation rule can account for the full gamut of possible input predicates. They claim instead that af-

fixes are lexical units in their own right, and therefore, should be represented in the lexicon. The type of representation they suggest is an expansion of the notion of lexical template. They then proceed to discuss the way affixal representations fuse with their corresponding basis.

Of central importance is the notion of lexical template as an alternative to the predicate frame. In order to test the explanatory power of this construct, the rest of the papers in this volume concentrate on investigating the methodological scope of this proposal by applying it to several key issues in lexical semantics and the semantics of syntax.

Chris Butler examines in detail the notion of lexical template, exemplifying it by one of the most polysemous predicates in English, i.e. *catch*. The author provides empirical evidence from informant testing and corpus data extracted from dictionaries and the British National Corpus and proceeds to assess to which extent the full complexity of the behavior of *catch* can be captured within a lexical template. The author, though admitting the shortcomings of both the notion of predicate frame and the use of natural language phrases for meaning representation, concludes that it is impossible to posit a lexical template for high-complement taking predicates like *catch* such that all examples can be accounted for. Finally, he opens a new line of thought on the status of primitives and tentatively considers the use of Wierzbicka's semantic primitives for the construction of an ontology.

Marta María González Orta, using a representative sample of data in Old English, proposes a typology of lexical templates for the lexical domain of speech, applying them to the lexeme *SECGAN* as the major representative of this lexical class. The author proposes a maximal lexical template and shows how the different alternations of this predicate can be accounted for by means of the application of the Lexical Template Modeling Process. Similarly, though centering on the analysis of Modern English, Margarita Goded Rambaud and Rocío Jiménez Briones examine the iconic nature of a lexical subclass of the domain of feeling. After extracting the parameters en-

coded in this lexical subdomain, they move on to propose a lexical template for this group of verbs.

The last paper addresses the status of arguments in FG against the background of the key article. Javier Martín Arista, drawing on the notion of lexical template, proposes a refinement of the classification of second and third arguments as represented in the Semantic Function Hierarchy. The author claims that such a theoretical move is motivated semantically and argues that Result and the telic version of Source, Path, Direction and Location are nuclear semantic functions with argument status. Finally, his *Principle of Lexical Template Instantiation*, a slightly modified version of Mairal Usón and Faber's Lexical Modeling Process, accounts for the well-formedness conditions on semantic and syntactic realization.

In all, this volume contains a number of ground-breaking proposals which challenge the orthodox view of argument structure in FG as configured in terms of a predicate frame and a meaning definition. Furthermore, this volume describes new paths of research regarding the syntax-semantic interface in that it highlights the interaction between predicate frames and meaning definitions, a methodological issue which has as yet not been addressed in Functional Grammar. We are confident that the contributions set forth in the present volume represent a step forward in the complex linguistic enterprise of accounting for the mapping of syntax to semantics.

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The predicate in Functional Grammar

J. Lachlan Mackenzie

1. The predicate as an ascriptive item

In his seminal proposal for a new architecture of Functional Grammar (FG), Hengeveld (to appear) sees communication as consisting of a succession of moves. A dialogue is thus in essence an alternation of moves, much as in a chess game. Each move consists of one or more utterances, i.e. acts of utterance. Some utterances are purely interactional, as with the first utterance recorded in (1), which serves merely to indicate assent (*Yes*). Other utterances combine interaction with propositional material, as with the second utterance recorded in (1), *the train has arrived.*

(1) *Yes, the train has arrived.*

The act of utterance *the train has arrived* is analysed as containing two basic subacts and a number of operators and functions that further specify those subacts and their interplay. On the one hand, the words *has arrived* reflect a subact of ascription, whereby the speaker ascribes arrival to an entity, and a number of operators (Present, Perfect) that modify that subact of ascription. On the other hand, the words *the train* reflect a subact of reference in which the speaker invokes the entity to which arrival is ascribed, as well as a number of operators (Definite, Specific, Singular) and functions (Processed, Subject, Topic). In this particular case, the speaker has judged that the subact of reference is best supported by a further (sub)subact of ascription. If she had said *It has arrived*, then *it* would have been purely referential, unsupported by ascription. In (1), however, the subact of reference is further restricted by the introduction of an ascriptive subact invoking the lexical item TRAIN. This complex inter-

play of ascription and reference is what underlies the evocation of States of Affairs and is organized by the structures that underlie the construction of a propositional utterance. Thus the layered structure imposes a strict separation of operators, functions, ascriptive and referential material: the predicate frame ensures the primacy of the ascriptive subact with its dependent subacts of reference (reflected in arguments), just as the structure of the term constrains ascriptive subacts within the term to appear as restrictors upon the primary subact of reference.

In (1), the two ascriptive subacts are strongly associated with the items TRAIN and ARRIVE. These are drawn from the Fund, which contains the totality of items, basic and derived, available for subacts of ascription in the language under consideration. It is these items that are known in FG as predicates. The Fund also includes other items, notably proper names such as *Malibu* or *Geraldine*, which are not predicates but "basic items", items ready-made for subacts of reference; other occupants of the Fund include items that are called upon by the expression rules to indicate the presence of functions (e.g. English *by* to mark an Agent that lacks the syntactic function Subject) or the presence of operators (e.g. Spanish *estar* to mark the presence of the operator Progressive, cf. Olbertz 1998: 479); and then there are items such as English *yes, well*, etc. that are directly indicative of an interactional intention. The examples given hitherto all correspond to words. But the Fund also contains items that are both less than and more than words: thus we will find there affixes, both inflectional and derivational, as well as affixes that have ascriptive value and which therefore need to be regarded as predicates (Fortescue 1992 gives some examples for Koyukon; see also Mithun 1999: 49 on Yup'ik "affixes with verb-like meanings"); but the items in the Fund may also be multi-word, extending from phrasal verbs like English PUT OFF 'postpone' through idioms like ALL HELL BREAK LOOSE, to entire texts, e.g. the Lord's Prayer.

FG distinguishes a central component of the Fund, the Lexicon, which contains all those items that are not derived by some procedure (generally that of predicate formation, see section 4 below) from a simpler item. The Lexicon can thus be defined as the totality of basic

predicates, whether these take the form of a morpheme, a word, or a fixed (i.e. synchronically non-derived) combination of words. It will be clear that the Lexicon is central to the Fund in a number of respects: synchronically, it provides the building blocks from which derived predicates, e.g. compounds and other multi-word items, are formed; historically, many proper names (e.g. *The White House*) originate in items from the lexicon; and many function words (i.e. items introduced by the expression rules) derive by grammaticalisation from lexical predicates (see section 6 below).

The defining property of the predicate will be its availability for the communicative subact of ascription. Ascription will be understood here in its normal sense of the assignment of property to a (single) participant, as in the discussion of (1) above, but will also be extended to cover the naming of a relation between two or more participants in that relation. Thus in (2):

(2) *Keith gave Mary his lecture notes.*

the predicate GIVE ascribes a relation that holds among the three participants in the State of Affairs. Ascription will also be further extended to cover instances where no participant, i.e. no dependent subact of reference, is present, as in the case of meteorological predicates like English RAIN; in (3), *it* does not reflect an act of reference:

(3) *It was raining.*

These distinctions are reflected in the quantitative valency of the predicate, to be further discussed in section 3 below.

The predicate is indissolubly linked to the notion of a State of Affairs (SoA). Whereas each subact of reference invokes an entity of some kind, each subact of ascription invokes an SoA. An SoA is emphatically not an objective situation in the external world, but a speaker's subjective (and possibly even illusory) conceptualisation (cf. Dik 1997a: 51). SoAs can be embedded within one another. Thus in the second utterance in (1) above, the SoA of being a train is embedded within the SoA of arriving: in FG terms, the propositional

material being imparted is essentially as follows: "I ascribe arrival to an entity to which I ascribe the property of being a train".

SoAs are classified according to their aspectual characteristics. Prominent among these are control (whether or not there is a participant who/which determines the occurrence of the SoA, as opposed to merely undergoing it) and dynamism (whether or not the SoA involves a change). In an Action SoA, both control and dynamism are present; in a State SoA, both are absent. FG also recognises two other kinds of SoA: Positions (+control, -dynamism) and Processes (-control, +dynamism). These distinctions do not apply in FG to predicates, but to the SoA that is invoked in the subact of ascription. Thus in the second utterance in (1) above, the SoA is a Process, since the train does not control its own arrival.

The aspectuality of the SoA determines the semantic functions of the arguments associated with the predicate. Thus, if the SoA is an Action, the first argument of the corresponding argument will be Agent; if the SoA is a Process, its first argument will be Processed; see Dik (1997a: 117-124) for further details. There has been a tendency in FG to ascribe particular arrays of semantic functions to specific predicates. For example, GIVE, as exemplified in (2) above, has been used time and again as a classical example of a predicate almost inherently associated with Agent, Goal (= Patient), and Recipient. Butler (2001) has demonstrated the folly of this approach, showing that in actual usage, which deserves priority in a functionalist approach, GIVE has a much broader privilege of occurrence. The conclusion must be that the assignment of semantic functions is dependent upon the conceptualisation that is reflected in the particular SoA.

In English, not only with the predicates just discussed but quite generally, the distinctions between different semantic functions of first arguments are not expressed morphologically. The evidence for their presence must be drawn from their co-occurrence potential with adverbs (Agent with *carefully*, Agent, Force or Processed with *rhythmically*, etc.). The opposition between 'falling on purpose' and 'falling accidentally' can in English only be expressed by adding some such satellite as *inadvertently*. Van Valin and LaPolla (1997: 119) report that in Tsova-Tush, this very distinction is reflected in the

distinction between ergative and absolutive case (for a more general treatment of the morphological consequence of the [±control] parameter, see Mithun 1999: 128-131):

(4) a. *Vuiž-n-as*
fall-TNS-1sgERG
'I fell down on purpose.'
b. *Vož-en-sO*
fall-TNS-1sgABS

Having established the status of the predicate as an occupant of the Fund with an ascriptive function, we will now progress, in section 2, to a consideration of how predicates are represented in FG, expanding the discussion in section 3 to the predicate frame. Section 4 will deal with predicate formation rules (PFRs), showing how each element of the frame is subject to their operation. Section 5 treats a particular kind of PFR, term predicate formation, and section 6 looks at the potential for predicates to undergo grammaticalisation.

2. The representation of predicates in the Fund

Predicates are listed in the Fund in the following form:

(5) (f_i: predicate (f_i))

The variable (f_i) was introduced in Dik (1989: 50), but was developed above all by Keizer (1992a) and Hengeveld (1992: 51-55). The formalism given in (5) has the effect of assimilating predicates to terms (i.e. referring expressions), which since the inception of FG have had the general format (Variable: Predicate (Variable)), a format which has since been generalised to each of the layers that have continued to characterise the model in its various manifestations (cf. Hengeveld to appear for the most recent of these).

There are various justifications for the variable (f_i). Firstly, there are predicates that take other predicates as arguments, for example the predicate LOOK, as exemplified in (6):

(6) *You look ill.*

Here the predicate ILL occurs as the head of the second argument of the predicate LOOK (Hengeveld 1992: 42-43): if arguments are defined as terms, then it is appropriate that the argument should take the form associated with argumenthood. Secondly, on the assumption that anaphora is a matter of co-indexing (but see Cornish 2000 for a rejection of that assumption), a predicate variable allows anaphora to predicates to be handled in an analogous way to anaphora to terms (see Keizer 1992a: 4; Hengeveld 1992: 53):

(7) *You look ill, and so does he.*
... (f_i: ill (f_i)) ... (Af_i) ...
where A is an anaphoric operator

Similarly, predicates can be the antecedent for relativisation, as in (8) (Keizer 1992a: 4):

(8) *I look ill, which I am not.*
... (f_i: ill (f_i)) ... (Rf_i) ...
where R is a relativisation operator

Thirdly (and this was already implicit in the representation given in (7)), predicates can be subject to operators; and operators apply in FG to variables. An example of such an operator is Progressive. We have already mentioned the application of the operator Progressive to verbal predicates in Spanish, yielding the auxiliary *estar* (Olbertz 1998: 479); Hengeveld (1992: 37) advocates an analogous analysis for the occurrence of copular *estar* with adjectival predicates:[1]

(9) *Antonio* *está* *loco*
Antonio COP.PRES.3SG crazy
'Antonio is being crazy.'

... (Progr f_1: loco (f_1)) (d1x_1: Antonio (x_1))$_{Zero}$ ...

Analogously, the Ingressive operator applied to an adjectival predicate induces the copula *become* in English (cf. Hengeveld 1992: 38). According to Rijkhoff (1991), nominal predicates, too, can display aspectual distinctions: thus noun classifiers such as *te7* ('plant') in Jacaltec will be analysed as operators on the predicate variable (f_i):

(10) a. *kaj* *te7* *tahnaj* *ixpij* (Grinevald 2000: 65)
red PLANT ripe tomato
'The ripe tomato is red.'
b. *te7* *tahnaj* *ixpij*
(dx_1: (PLANTf_1: ixpij (f_1)) (x_1): (f_2: tahnaj (f_2)) (x_1))
'the ripe tomato'

In much current work in FG (for example in most of Dik 1997a, 1997b), the second occurrence of the (f_i) variable, where it appears as an argument of the predicate, is omitted. This applies to all other variables, too, with the aim of increasing the legibility of representations; cf. Dik (1997a: 63). The representation in (10b) would then appear as (11):

(11) (dx_1: (PLANTf_1: ixpij): (f_2: tahnaj))

This emendation was first proposed in Mackenzie (1987), but not merely with the aim of simplifying representations. The intention was to make the representation less like a logical structure put together *a posteriori*, and to emphasise the fact that the speaker is with each predicate ascribing a property on-line, as suggested in section 1 above. Thus (11) would be read as follows: "there is a definite entity such that I ascribe the plant-property IXPIJ such that I ascribe the property TAHNAJ".

This approach to representation has the added advantage of presenting prototypical (i.e. "non-relational") nominal predicates as having no arguments. In orthodox FG, non-relational nouns such as English TOMATO appear in the Fund with an obligatory Zero-argument:

(12) $(f_1$: tomato$)\ (x_1)_{Zero}$

However, this type of representation predisposes nouns towards predicative use, i.e. towards occurrence in utterances in which the application of that noun to an argument is being asserted. The predicative use of nouns is of course not unknown (although it is rather restricted in English, cf. **This is tomato*: we will see in section 5 below how we arrive at *This is a tomato*). Nevertheless, nouns are defined in FG in terms of their prototypical use as heads of terms (cf. Hengeveld 1992: 58), where the property expressed by the noun is, as we have seen, being ascribed rather than asserted as such. For such prototypical cases, the avalent representation suffices:

(13) $(f_1$: tomato$)$

(13) can be expanded, in languages that permit "bare nominal predicates" into (12) through valency extension (see section 4 below) where the speaker wishes to assert the application of a nominal predicate to an argument.

In this approach, relational nouns, too, will lack a Zero argument, but they will be distinguished by having an obligatory argument with a different semantic function; thus the relational noun FRIEND will appear in the Fund of English as (14a), with the Reference term being available for the befriendee, as shown in (14b):

(14) a. $(f_1$: friend$)\ (x_1)_{Ref}$

b. *Bill's friend*
$(d1x_1$: $(f_1$: friend$)\ (d1x_2$: Bill$)_{Ref})$

The above discussion has assumed, with traditional FG, that predicates occur in the Fund with a number of arguments that ranges upwards from zero. These arguments form part of the predicate frame to be described in section 3. Before progressing, however, we should take note of García Velasco and Hengeveld's (this volume) radical departure from this orthodox FG position: they suggest that predicates, as they are represented in the Fund, lack any frame whatsoever. In their approach the frame is assigned on-line, both by the speaker in production and by the hearer in comprehension. They propose a universal set of frames of which each language makes a subset available to its users. Certain Papuan languages, for example, make no use of trivalent frames, expressing three-place relations through serialization.

In formulating an utterance, the speaker selects a particular predicate and then chooses an appropriate frame from the array permitted by her language. In García Velasco and Hengeveld's view, this selection process is guided by the conceptual representation of the predicate in question, but they do not exclude the possibility of creative deviations from the standard choices. The hearer similarly constructs the frame from the coded utterance against the background of the conceptual representations and contextual information available to him. A clear advantage of this proposal is that the various frames associated with one and the same predicate no longer have to be formed by predicate formation rules from some basic frame – for who is to say which frame is basic? A disadvantage, which may be overcome in time, is that the proposal is dependent upon an as yet rather sketchily described conceptual representation. To the extent that the development of that conceptual representation is based upon linguistic evidence, there is a danger of circularity.

Without taking a position on this recent and untested proposal, let us turn in the following section to the nature of the predicate frame. What we will find there will apply either within the Fund as envisioned in orthodox FG or to the result of the on-line creation of frames proposed by García Velasco and Hengeveld.

3. The predicate frame

As has been implicit in the preceding discussion, each predicate is associated with a frame, a structured bundle of information that is vital in creating the underlying representation of utterances and in instructing the expression rules to produce the appropriate output. Dik (1997a: 77-104) requires five kinds of information to be included in every predicate frame. These will now be dealt with in turn.

3.1. The form of the predicate

Firstly, the Fund must contain all unpredictable information about the phonological form of the predicate: this is generally given in the form of a string of phonemes, possibly with an indication of tones; where relevant, there will also be an indication of the characteristic accent position (CAP, see Dik 1997a: 448). The extent to which supplementary information is required will vary enormously from one language type to another. For an English noun, the formation of the plural need not be specified in the Fund, since it is fully predictable from the phonological form of the predicate: the familiar allomorphy rules will be located among the expression rules. Only exceptional predicates like OX, CHERUB, KNIFE, etc. will have their plural form specified in the Fund. The gender of the noun can also be left unspecified, since the choice of third-person singular anaphoric pronouns (the only forms affected by gender) is determined by the perceived animacy/non-animacy and, in the case of animacy, the perceived sex of the referent. In English, gender is thus a referential category, and is not associated with the predicate, the ascriptive component of a term.

For a German noun, however, the frame of each noun will have to contain information about the morphological paradigm to which that noun belongs, from which the plural form as well as various case forms will become predictable for the expression rules, but also information about which of the three gender classes it belongs to, since that determines the expression of anaphoric reference; neither paradigm class nor gender are predictable from the form of the predicate,

although the two matters are partially interlinked. Even greater complications may be foreseen for the analysis of Athabaskan languages, in which each verbal predicate has an imperfective, a perfective and a future/progressive form, and where "[e]specially for verbs of position ... motion ... or handling, different verb stems are chosen according to the shape, texture, and number of objects involved" (Mithun 1999: 363-364).

The purpose of providing all this morphophonological information with each predicate is to reduce the work done by the expression rules to automatic and fully regular formal processes; after all, the underlying representation is designed to contain all the information that the expression rules need to do their work. An alternative architecture is thinkable, in which the expression rules respond not only to the underlying representation, but also, in parallel, consult the Fund for morphophonological information. This would not only be more efficient, but may be psychologically more adequate, reflecting parallel rather than linear production of morphophonological and semantico-syntactic expression.

3.2. The category of the predicate

The predicate frame, secondly, will contain a statement of the category, the "part of speech" (Hengeveld 1992), to which the predicate belongs. This is conventionally indicated in square brackets immediately after the predicate in question. The emic distinctions to be made here are those that are relevant for the operation of the expression rules of the language in question. Hengeveld (1992) has shown that languages draw differently from the etic categories {Verb, Noun, Adjective, Adverb} such that a language that has a particular category will also have the categories listed to the left: thus no language will have Adjective that lacks Noun. It follows that there will be languages with only Verbs, and indeed Hengeveld has identified Tuscarora (and some others) as just such a language: a language like that could be said to have no syntactic categories at all. At the same time, languages can be typologised as either rigid or flexible, with an in-

termediate category of specialised languages, represented *inter alia* by English: in a specialised language, all four categories are present; in a rigid language, one or more parts of speech is lacking; in a flexible language, a single part of speech is used in different functions. In work since 1992, Hengeveld has shown that his systematisation of parts of speech has considerable predictive power for understanding the properties of languages.

Other traditionally recognised parts of speech (Article, Conjunction, etc.) are never used for ascription and thus do not apply to predicates. These will all be introduced by expression rules: thus articles will express various term operators, and subordinating conjunctions will express the semantic functions attaching to embedded or dependent clauses. In orthodox FG, adpositions have similarly been regarded as expressing semantic functions, and therefore (in contrast with generative grammar, cf. Jackendoff 1977) Adposition has not been included in the list of parts of speech, so that adpositions are not regarded as predicates. This seems correct for those that have a purely functional status, such as English *by* as a marker of the semantic function Agent or Japanese *wa* as a marker of the pragmatic function Topic. Mackenzie (1992, 2001), however, has argued that certain adpositions in English, namely those that indicate refinements of general semantic functions such as Loc(ative) and Temp(oral), do have ascriptive status and should be included in the Fund. This would entail the recognition of an etic category Adposition. Mackenzie (2001), however, argues for a hypercategory Ad which would cover both Adverb and Adposition – note that he takes spatial and temporal adverbs to represent the basic class of adverbs rather than, as Hengeveld (1992) does, manner adverbs, since the latter, in those languages that possess them, typically appear to be adjectives that require morphological adjustment to fulfil their special function as modifiers of non-nominal predicates.

3.3. Quantitative valency

The third type of information contained by the predicate frame is the quantitative valency of the predicate, i.e. a statement of the number of arguments it requires. An SoA may contain an unlimited number of participants. In consequence, a predicate may be accompanied, at least in certain language types, by an unlimited quantity of associated terms. But FG claims that only a restricted number of these, the maximum being three, have argument status, the others all being satellites, i.e. terms that are added to the predicate frame stored in the Fund. The distinction between arguments and satellites has plagued every theory that has proposed such a contrast, and FG is no exception.

Textual analysis has shown that many predicates assumed to have a certain number of arguments frequently occur with one or more of those arguments unspecified (cf. García Velasco and Portero Muñoz to appear). Consider the following example, drawn from a television show in which A is asking B his impression of her work on his house:

(15) A: *Do you like?*
B: *I love!*

Under the standard analysis, the second arguments of the verbs LIKE and LOVE are lacking here; the conceptualisation of the SoAs strongly suggests that the missing terms are not satellites. Since FG spurns deletion rules (Dik 1997a: 19), and even a notion such as zero realisation seems suspiciously close to deletion, it is forced to take recourse to a process of valency reduction to explain such examples: such a move is descriptively adequate, but explains little.

A radical alternative suggests itself, one which the proposal by García Velasco and Hengeveld (this volume) mentioned above could presumably accommodate with ease: assume that all predicates are fundamentally avalent but that speakers are typically, but not always, constrained by communicative circumstances, and sometimes by lexical requirements, to specify terms that are dependent upon those

predicates ("arguments"); they are, however, also free to leave terms unspecified. This would be an application of the Gricean Maxim of Quality to quantitative valency. It is to be expected that verbs, with their prototypically predicative use, will typically be accompanied by arguments, whereas nouns, as prototypical heads of terms, will have less need for such specifications (cf. in this regard Mackenzie's 1994 argument that even relational nouns are avalent in the Fund). To return to (15), we may assume that speakers A and B have been so committed to expressing their feelings that they place the relevant predicates in utterance-final (focal) position.

A further case in point is the analysis of action nominalisations in FG. Dik (1997b: 165) argues that both DESTROY and its nominalisation DESTRUCTION are bivalent, with Agent/Force and Goal arguments. This proposal is based upon the observation that parallelisms of the following kind can be perceived:

(16) a. *The enemy destroyed the city.*
b. *the enemy's destruction of the city*

In generative grammar, this kind of observation led to the lexicalist hypothesis (Chomsky 1970) and X-bar theory (Jackendoff 1977). In FG, it has engendered Dik's proposal to locate the observed parallelism in the respective Fund entries of DESTROY and DESTRUCTION and all other such pairs, with the expression rules being primed (1997b: 168) to realise Agent/Force as enclitic *'s* and Goal as *of* where these are arguments of a nominal predicate. Mackenzie (1996: 336) has argued that this approach is stipulative rather than explanatory, and above does no justice to the patent fact, which emerges clearly from textual analysis, that the arguments of nominalisations occur much less frequently than those of the corresponding verbs. The alternative he proposes is to regard such nominalisations as DESTRUCTION as avalent, and to permit the speaker to add satellites as the communicative situation demands; in languages such as English, these satellites take the form of possessors, metaphorical owners of the quasi-thing that arises as the result of nominalising a verb.

To abolish quantitative valency altogether may be going too far: whereas English EAT can regularly occur without mention of its Goal, that seems more difficult for DEVOUR; if the second argument of PUT (in the sense of 'place, position') is specified, the third (Locative) argument is generally required, although that is not true of either PLACE or POSITION:

(17) a. *He ate all night.*
b. *?He devoured all night.*

(18) a. *I then positioned the lamp.*
b. *?I then put the lamp.*

Perhaps the answer is to retain the hypothesis of the avalency of predicates but to recognise, on the basis of empirical analysis of actual language use, a scale of explicitness. Languages also seem to differ in this regard. Some are more explicit in requiring the specification of participants in SoAs than others: thus Mithun finds that predicate-argument structures "are relatively rare in many North American languages" (1999: 187), showing how in Tuscarora "[s]entences often consist simply of a verb serving as a predicate".

3.4. Qualitative valency

Fourthly, the frame indicates the qualitative valency of the predicate, i.e. the semantic properties of its associated arguments – let us continue to grant that predicates can indeed take arguments. Qualitative valency covers the semantic functions of the arguments and the selection restrictions that apply to them.

Arguments are classified as first, second or third (A1, A2, A3) on the basis of the combinations permitted by the language: thus the semantic functions of arguments associated with monovalent predicates will be assigned to A1; with bivalent predicates, the A1 will be that argument that shares the same semantic function as the sole argument of monovalent predicates, the other argument being A2; and

analogously for A3. The semantic functions assigned to A1, regardless of the quantitative valency of the predicate, are determined by the control and dynamism features of the SoA:

(19)

SoA	A1
[+control, +dynamism]	Agent
[+control, -dynamism]	Positioner
[-control, +dynamism]	Processed or Force
[-control, -dynamism]	Zero

The semantic functions assigned to A2 are much more loosely connected to the type of SoA: A2 is typically Goal (= Patient), but in certain non-telic SoAs A2 may have the semantic function Reference; where a spatial meaning attaches to A2, such semantic functions as Locative, Direction and Source may be applied. The sets of semantic functions applying to A1 and A2 respectively are non-overlapping: thus FG insists that in (20), the semantic function of the A1 of (20a) is distinct from that of the A2 in (20b):

(20) a. *The rock*$_{\text{Processed}}$ *moved.*
b. *The students*$_{\text{Agent}}$ *moved the rock*$_{\text{Goal}}$.

Whereas languages generally conflate the distinctions between Processed and Goal (in ergative systems) or between Processed and Agent (through Subject assignment), the FG position is supported by such languages as Nez Perce, which Mithun (1999: 229) cites as displaying all three distinctions:

(21) Nez Perce

Semantic function	Marking
Agent A1	*-nim* (ergative suffix)
Processed A1	-Zero (intransitive subject)
Goal A2	*-ne* (accusative suffix)

But, as Mithun (1999: 229) also observes, "[t]ripartite systems such as this ... are rare, probably because they are not maximally efficient".

The semantic functions of A3 arguments, in those languages that can be claimed to have these, are typically spatial; with verbs of giving, teaching, etc., where the beneficiary is high on the animacy scale, A3 may be a Recipient. Whereas FG permits some overlap between A2 and A3 (both may bear a spatial semantic function), no overlap between A1 and A3 is possible. Across many languages, however, Recipient marking is often found on a solitary A1 in an experiential predication, cf. German (22) and Koasati (23; Mithun 1999: 238):

(22) a. *Er* *gab* *mir* *ein* *Buch*
3SG.NOM give.PRET 1SG.DATIVE INDEF book.ACC
'He gave me a book.'

b. *Mir* *graust* *vor* *der* *Operation.*
1SG.DATIVE shudder.PRES before DEF operation
'I dread the thought of the operation.'

(23) a. *st-am-íl*
INSTR-1SG.DAT-arrive-here
'Bring it to me!'

b. *am-ayóhki-'s*
1SG.DAT-feel.acrophobia-PAST
'I have a fear of heights.'

In FG, experiential predicates are analysed as parasitic upon non-experiential ones, with the sole difference that Exp is appended to the semantic function to trigger the appropriate expression rules. Thus Dative, in both German and Koasati, will be occasioned by either Recipient or ProcessedExp; FG in its present formulation cannot offer any synchronic explanation for this recurrent syncretism.

Another facet of qualitative valency is the selection restriction. Dik (1997a: 91-97) recognises that selection restrictions have been controversial since their introduction into linguistics by Katz and Postal (1964: 13); cf. McCawley (1971: 219), who refers the utterer of *My toothbrush is alive and trying to kill me* to a psychiatric clinic rather than a remedial English course. Yet Dik insists that selection restrictions must form part of the predicate frame: (a) there are predicates like *blond* the argument of which must refer to hair (or by metonymy to the person from whom the hair grows); (b) hearers are able to infer relevant aspects of the meaning of an unfamiliar word from the selection restrictions of the predicates applied to that word; (c) grammaticalisation often involves the loosening of selection restrictions, a fact which could not be captured if they were banned from the grammar; and (d) certain predicate formation rules (see section 4 below) affect only selection restrictions. In the spirit of McCawley's *bon mot*, however, Dik recognises that selection restrictions are violable, in which case a metaphorical interpretation can arise. Thus (24) transgresses both selection restrictions on GUZZLE, i.e. that the Agent be <animate> and the Goal <edible>:

(24) *My car guzzles gasoline.*

Dik assumes that the hearer of (24) and similar utterances observes the clash between the predication that is presented and the selection restrictions of GUZZLE and applies special interpretation strategies to resolve this clash, which involve a quest for a metaphorical understanding of GUZZLE that is comparable with its basic meaning. This view, however, based as it is on the assumption that literal interpretations are the first to occur to the hearer, underestimates the extent to which much of our cognition is metaphorical; top-down processing may well cause the hearer to go directly to the metaphorical understanding without following the garden path that leads to a textually irrelevant literal interpretation (for a careful discussion of this issue, see Steen 1994: 90-94).

3.5. The meaning definition

The final component of the predicate frame is the meaning definition. The meanings of predicates are, in distinction to what is proposed in RRG (Van Valin and LaPolla 1997), defined exclusively in terms of other predicates of the same language. This is conducted in a stepwise manner (cf. Dik 1978), such that the meaning of a complex predicate is defined as a specification of a predicate that has one degree fewer of complexity; this defining predicate is in turn also subject to definition, until, at the end of the line, a predicate is reached which cannot be further defined. The embryonic theory of meaning definitions proposed by Dik (1997a: 97-103) has been thoroughly elaborated by Martín Mingorance (1998) and Faber and Mairal Usón (1999) into the Functional Lexematic Model. This model develops the hierarchical view of the Fund, in which the paradigmatic dimension (the relations among predicates) is shown to have as much importance as the syntagmatic dimension that has otherwise been most prominent in FG. In particular, Faber and Mairal Usón demonstrate that the paradigmatic dimension is highly relevant for syntax: the possibilities for the syntactic complementation of English verbs are predictable from the position of those verbs in the paradigmatic hierarchy. Semantics is in this way directly linked to syntactic form, so that the meaning definition becomes much more than an appendage to the predicate frame. Indeed, Faber and Mairal Usón propose replacing the predominantly syntagmatic predicate frame with the "predicate schema", in which both axes receive equal attention.

Mairal Usón and Faber (this volume) take this line of argument several steps further, rejecting stepwise lexical decomposition in favour of meaning definitions that quite explicitly pertain to RRG as presented in Van Valin and LaPolla (1997). They are particularly critical of the FG stance on such alternations as those identified by Levin (1993). They point out that FG simply assumes different predicate frames for the various patterns associated with any one predicate, without showing how these are generated; at best, productive relations between predicate frames are handled by predicate formation rules, as we shall see in section 4 below. In a detailed study of

verbs of cutting (*hew*, *hack*, *whittle*, ...), they devote attention to the actual generation of predicate frames, their proposal being that all the frames within one semantic domain are derived from a single canonical "lexical template". Each instantiated predicate frame (conative, middle, unspecified object, ...) results from a constrained reduction of this maximally specified template. The undoubted gain in explanatory force achieved by this proposal is bought at the expense of introducing a semantic metalanguage, which represents a radical departure from the original principles of FG. However, if it can be shown that this metalanguage can be properly constrained and that its use contributes to enhancing the cognitive adequacy of the model, Mairal Usón and Faber's proposals may well lead to a revaluation of the meaning definition, which they rightly say "need to play a more active role" (this volume: 41). In any case, it will be worth exploring the relation between their position and that of Hengeveld and García Velasco (2001), summarised in section 2 above, who claim that one of the factors determining the speaker's selection of predicate frame is a conceptual representation. Future work will have to determine whether this representation can be equated with the lexical template.

4. Predicate formation rules

Basic predicates (listed in the Lexicon) and derived predicates are linked through predicate formation rules (PFRs), which take the former as their input and deliver the latter. PFRs may also form more complex derived predicates from simpler derived predicates. Each PFR affects at least one of the five properties of predicates laid out in section 3; the various kinds of effect will now be studied in the same order.

4.1. Affecting the form of the input predicate

PFRs typically, but not always, affect the form of the predicate to which they apply. PFRs typically add affixes (prefixes, suffixes, or infixes) to the input predicate, or extend the input through reduplication, although cases of subtractive morphology have also been observed (cf. Dressler's 1987 observation that Russian nouns such as BIOLOG 'biologist' are derived from BIOLOGIJA 'biology' by subtraction of a portion of the stem). Another possibility is apophony (stem mutation; cf. Junger 1987: 62-96 for examples of relevant *binyanim*-affecting PFRs in Hebrew). The PFR may, however, have no morphological effect on the input: in English, for example, the Instance Nominalisation is formed from the verb stem without any change of form (RUN [V] > RUN [N]; JUMP [V] > JUMP [N]); with polysyllabic input, however, a shift of CAP is generally observed: *reMAKE* [V] > *REmake* [N]. The effect need not be limited to the morphology of the input predicate. Thus Dik (1980: chapter 3) argues that causativisation in Dutch involves the introduction of an auxiliary verb *laten*, and Baron and Herslund (1998) see English support verb constructions such as *make a survey, make threats (against)*, which involve the co-occurrence of a verb of general meaning and an instance nominalisation, as the result of predicate formation.

4.2. Affecting the category of the input predicate

The syntactic category of the input predicate is of course changed by PFRs of nominalisation, verbalisation and adjectivalisation. In the derivation of English *regionalisation*, the nominal input *region* is expanded into an adjective *regional*, which in turn becomes a verb *regionalise*, which then turns into the noun *regionalisation*. Other PFRs, however, do not alter the syntactic category of the input: thus in Chukchee (Muravyova 1998: 536), the diminutive suffix *-qej* applies to nouns to yield other nouns; similarly for the Chukchee collective suffixes *-giniw* and *-mk*. Causativisation rules typically apply to verbs to give other verbs, although an adjectival or nominal input is also possible, cf. English *broad* > *broaden*, *length* >

is also possible, cf. English *broad* > *broaden*, *length* > *lengthen*, etc.; as will be clear from the example of *regionalise*, nouns may also undergo causativisation via an intermediary stage of adjectivalisation.

4.3. Affecting the quantitative valency of the input predicate

As to quantitative valency, PFRs may be valency-extending, valency-reducing or valency-preserving. Valency extension has been associated in FG above all with causativising PFRs, which are seen as adding an argument with the semantic function Agent (or Causer) to the array of arguments in the input frame. Dik (1985) points out that the result of this operation is frequently subject to a Prototypical Expression Model (PEM). In other words, the expression rules tend to normalise the output according to the Principle of Formal Adjustment, so that, for example, the demoted Agent in French causative constructions is expressed in (25) as if it were a Recipient, the Agent–Goal–Recipient combination being an example of a PEM:

(25)	*Elle*	*fait*	*laver*	*la*	*vaisselle*	*à*
	3SG.FEM	cause.3SG	wash	the	dishes	REC
	son	*mari.*				
	3SG.POSS	husband				
	'She has her husband do the dishes.'					

Valency reduction involves either the suppression of one argument from the array in the input predicate frame or its incorporation into the predicate. In the case of a bivalent predicate, either A1 or A2 may be suppressed. A1-suppression in an Action is associated with the speaker's decision not to mention the Agent. Consider as an example the German verb *gehen* 'go', normally associated with the arguments Agent and Direction. Suppression of the Agent does not affect the verb form of the verb, but calls for an impersonal (i.e. non-referential) subject *es*:

(26) a. *Dann gingen wir ins Gebirge.*
Then go.PRET 1PL.NOM in.the mountain.COLL
'We went into the mountains.'

b. *Dann ging es ins Gebirge.*
Then go.PRET 3SG.NEUT.NOM in.the mountain.COLL
'We/they/... were off into the mountains.'

A2-suppression, it is emphasised in FG, offers a puzzle to the interpreter: a normally n-place predicate is presented as having (n-1) places. The solution, Dik (1997b: 13-14) claims, will be found in one or more of three possibilities: (a) the A2 should be interpreted as non-specific (and therefore unspecified); (b) the A2 is identical to A1 (the reflexive interpretation); (c) if A1 is plural, the relation between A1 and A2 is reciprocal. I have not been able to find a language in which all three possibilities are present with the same form. English (see (27)) allows the same form for the (a) and (b) interpretations, but requires *each other* for (c); German (see (28)) must distinguish between (a) and (b), but allows (b) and (c) to be expressed identically, although the adverb *gegenseitig* may be added to clarify that a reciprocal meaning is intended.

Note that German marks valency reduction with interpretations (b) and (c) by means of a reduction marker (R), the "reflexive" pronoun *sich*.

(27) a. *Men do not like to wash* (valency reduction; interpretations (a) and (b))

b. *Men do not like to wash each other* (no valency reduction; interpretation (c))

(28) a. *Männer waschen nicht gern.*
man.PL wash.PRES NEG with.pleasure
(valency reduction; interpretation (a))
b. *Männer waschen sich nicht gern.*
man.PL wash.PRES R NEG with.pleasure
(valency reduction; interpretation (b) or (c))
c. *Männer waschen sich gegenseitig nicht gern.*
man.PL wash.PRES R reciprocally NEG with.pleasure
(valency reduction; interpretation (c))

Valency reduction is also at play in incorporation: here the reduced argument survives in the expression, but now loses referentiality. Van Valin and LaPolla (1997: 123) give the following example from Lakhota:

(29) a. *Wičhása ki čhą ki kaksá-he.*
Man the wood the chop-CONT
'The man is chopping the wood.'
b. *Wičhása ki čhąkáksa-he.*
Man the wood-chop-CONT
'The man is chopping wood.'

Dik (1997a: 12) assumes that a similar rule applies in English, but that the output may not occur as such; it is necessarily input to a further PFR of Agent Noun Formation: cf. *work wood* > **wood-work* > *woodworker*. Mackenzie (1990: 138-139) considers this possibility for English, but concludes that it is costly to require of the incorporation rule that its output should never be the basis for forming a predication. He prefers to analyse such forms as *woodworker* as deriving from regular nominal compounding of N_1 *wood* and N_2 *worker*, with no fixed semantic relation between N_1 and N_2. N_1 will be most commonly interpreted as the Goal of the SoA of N_2, but other possibilities are equally valid: *headworker* (Instr), *field worker* (Loc), *star worker* (Qual), etc.