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Functionalism and Formalism in Linguistics
Volume II: Case Studies

FUNCTIONALISM AND FORMALISM IN LINGUISTICS

VOLUME II: CASE STUDIES

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Formalizing Functionally

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Abstract

This paper presents Functional Grammar (Dik 1989) as a model of grammar that is both functional, in the sense that it views language essentially as an instrument of communication, and formalizing, in the sense that it uses a formal representational system to capture linguistic facts. The data used to illustrate the properties of such a combined approach concern the expression of Tense, Mood and Aspect categories and of complement clauses.

1. Functionalism and Formalism

The terms "Formalism" and "Functionalism", although generally accepted as designations of two different approaches within linguistics, are not entirely adequate, since they embody two different kinds of oppositions.

The first opposition concerns the basic view of language adopted by linguistic theories, where, roughly speaking, one either views grammar primarily as an autonomous structural system, or views grammar primarily as an instrument of social interaction. Theories taking these two views of grammar may be called "autonomous" and "functional", respectively.

The second opposition is of a quite different nature. Some linguistic theories have the explicit aim of constructing a formal representational system, whereas other approaches do not. Theories of these two types may be called "formalizing" and "non-formalizing", respectively.

Since these two oppositions characterize linguistic theories independently of one another, they may be combined as in Table 1. In Table 1 four different types of linguistic theory are defined in terms of the two oppositions. Government and Binding Theory (GB) and Head-Driven Phrase Structure

Table 1. *Functionalism and Formalism*

	Formalizing	**Non-Formalizing**
Autonomous	A	B
Functional	C	D

Grammar (HPSG) would be examples of type A theories. Their opposite, type D, is exemplified by approaches such as those advocated by e.g. Halliday (1985) and Givón (1984/1990). Type B does not seem to have major contemporary representatives. This leaves us with type C, which is instantiated in various current models, such as Role and Reference Grammar (RRG, Foley & Van Valin 1984) and Functional Grammar (FG, Dik 1989).

In this paper I will concentrate on FG and contrast it with its immediate neighbours in Table 1, i.e. with approaches of type A and D. Functional Grammar shares one feature with each of these approaches. Like theories of type D, FG has a functional orientation. It differs from these theories in that it uses a formal representational system and thereby forces the linguist to systematically develop the theory via the consistent formulation of hypotheses. Like theories of type A, FG uses a formal representational system. It differs from these theories in that it has a functional orientation and thereby is universally applicable.

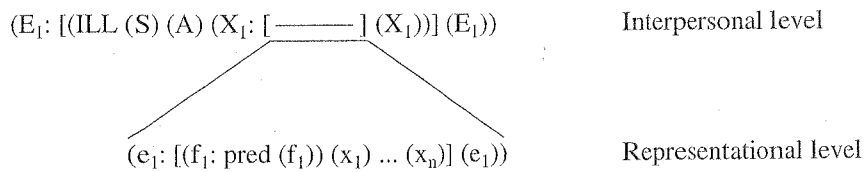
These points will be illustrated below. I will take the treatment of Tense, Mood and Aspect (TMA) categories in FG, described in section 3, as my point of departure and subsequently show in section 4 how this approach leads to a hypothesis concerning the treatment of complement constructions. Both in the area of TMA-systems and in the area of complementation the representations arrived at allow for strong crosslinguistic generalizations. In section 5 I then turn to the treatment of TMA-categories in Government and Binding Theory and argue that the way these categories are dealt with in this approach will not lead to crosslinguistically valid generalizations, since the categories under investigation are not functionally defined. Section 2 first presents an outline of some relevant aspects of Functional Grammar.

2. Formalizing in Functional Grammar

In FG, underlying representations of utterances are semantically and pragmatically based, universally applicable structures. Once fully specified, the underlying

structures are translated into actual linguistic expressions via the application of a language-specific set of expression rules. Thus, semantics and pragmatics are clearly separated from syntax and morphology.

Utterances are represented by means of a multi-layered hierarchical structure. The general format of this model is given in Figure 1. This representation is inspired by Foley & Van Valin (1984), but has been given a semantic basis in the FG framework.



Layer	Variable	Designation
Clause	(E_1)	Speech act
Proposition	(X_1)	Propositional content
Predication	(e_1)	State of affairs
Predicate	(f_1)	Property/Relation
Term	(x_1)	Individual

Figure 1. *The representation of utterances in Functional Grammar*

The structure in Figure 1 as a whole gives a representation of the speech act (E_1). Within this speech act a propositional content (X_1) is communicated. This propositional content contains a description of a state of affairs (e_1) which involves one or more individuals (x_1) ... (x_n).

The highest level of this structure is called, following Halliday (1970:325), the *interpersonal level*. It is structured on the basis of an abstract illocutionary predicate (ILL), such as DECL (declarative) or INT (interrogative), which has the speaker (S), the addressee (A) and the propositional content (X_1) as its arguments. The lowest level is called the *representational level*, following Bühler (1934:28). This level is structured on the basis of a predicate (f_1), which has one or more individuals (x_1) ... (x_n) as its arguments. The two levels correspond to Jakobson's (1971) speech event and narrated event, respectively. As Jakobson argued, many grammatical categories can be defined only if these two levels of analysis are taken into account.

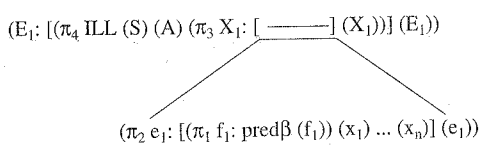
Each layer in Figure 1 represents a different type of entity, which may be

defined in terms of an extended version of Lyons' (1977:442–447) classification of entity types. A predicate represents a zero order entity, which has no independent existence, but can only be evaluated in terms of its applicability to other types of entity. A term (x_1) represents an *individual*, a first order entity, which can be located in space and can be evaluated in terms of its existence. A predication (e_1) represents a *state of affairs*, a second order entity, which can be located in space and time and can be evaluated in terms of its reality. A proposition (X_1) represents a *propositional content*, a third order entity, which can be located neither in space nor in time and can be evaluated in terms of its truth. A clause (E_1) represents a *speech act*, a fourth order entity, which locates itself in space and time and can be evaluated in terms of its felicity.

The distinction between propositional contents and states of affairs, or between third and second order entities, is of crucial importance within the model just presented. Propositional contents, i.e. thoughts, opinions, and the like, are mental constructs and, therefore, have no independent existence. By contrast, states of affairs, i.e. events, states, and the like, are part of the external world as conceptualized by the speaker, and exist whether they are thought about or not.

3. Tense, Mood, and Aspect in Functional Grammar

Each of the relevant units of clause structure discussed so far can be modified by operators. Operators are abstract elements representing semantic distinctions expressed by grammatical means. In Figure 2 the different types of operator are located in the model of the clause.



π_4	Illocution operators	Communicative strategy of the speaker (e.g. Reinforcement)
π_3	Proposition operators	Validity of the propositional content (e.g. Evidentiality)
π_2	Predication operators	Setting of the state of affairs (e.g. Tense, Reality)
π_1	Predicate operators	Modification of the internal structure of the state of affairs (e.g. Aspect)

Figure 2. *Tense, Mood, and Aspect operators in Functional Grammar*

All operator types have functions which are characteristic of the level at which they operate. Predicate operators (π_1) represent grammatical expressions which specify additional properties of states of affairs. Many aspectual expressions are captured by this type of operator. Predication operators (π_2) represent grammatical expressions which specify the setting of a state of affairs. They take care of e.g. tense and actuality expressions. Proposition operators (π_3) represent grammatical expressions which specify the propositional attitude of the speaker, as in the case of evidential modality. Illocution operators (π_4) represent grammatical expressions which modify the force of a speech act, and thus take care of e.g. the reinforcing use of emphatic morphemes.

This semantic characterization finds a systematic formal reflection in the way in which TMA expressions are realized crosslinguistically. The generalization is given in (1):

(1) Insofar as languages use one and the same morphological strategy for the expression of operators, these are expressed, with respect to the predicate, in the order:

Pred $\pi_1 > \pi_2 > \pi_3 > \pi_4$

or

$\pi_4 > \pi_3 > \pi_2 > \pi_1$ Pred

Thus, the expression of operators orients itself in either possible order towards the predicate, thereby reflecting the increasing semantic scope of these operators. Some examples are given in (2)–(4):

Hidatsa

(2) $Pred_V\ \pi_1\ \pi_2\ \pi_3$
Wíra i ápáari ki stao ski
tree it grow INGR PAST CERT
'The tree must have begun to grow'

English

(3) $\pi_3\ \pi_2\ \pi_1\ Pred_V$
The tree must have begun to.grow
DEF tree CERT PAST INGR grow
'The tree must have begun to grow'

In the Hidatsa example (3), the ingressive particle *ki* focuses on the initial phase of a state of affairs. It modifies the internal structure of the state of affairs to

which reference is made in the utterance and can thus be considered a π_1–operator. The past particle *stao* situates the state of affairs as a whole, including the ingressive specification, on the time axis, without affecting its internal structure, and can thus be considered a π_2–operator. The certainty particle *ski* specifies the speaker's commitment with respect to the truth value of the propositional content of the speech act, within which reference is made to the state of affairs characterized as past and ingressive, and can thus be considered a π_3–operator.

The order of particles thus reflects the semantic scope relations between the various classes of operators within the underlying representation. The same goes for the order of the auxiliaries in the English example (3), which is exactly the inverse of the order of the particles in (2).

A somewhat different example from Turkish is given in (4):

Turkish

(4) $\text{Pred}_V\ \pi_1\ \pi_2\ \pi_3$
Anlı- y- abil- ecek- miş- im
understand- *y-* ABIL- IRR- INFER- 1.SG
'I gather that I will be able to understand'

This example contains three different modal elements. The ability suffix *-abil* expresses ability, a participant oriented modality, which affects the relation between a participant in a state of affairs and the realization of that state of affairs, and may thus be considered the expression of a π_1–operator. The irrealis suffix *-ecek* characterizes the state of affairs, including the specification of ability, as unreal, without affecting its internal structure, and can thus be considered the expression of a π_2–operator. The evidential suffix *-miş* indicates that the speaker has no direct evidence for the propositional content he is presenting and thus indicates a lower degree of commitment on the part of the speaker, a feature of π_3–operators.

The examples given here are representative of a universal phenomenon, first extensively investigated in Bybee (1985), who noticed that within the domain of TMA expressions Aspect tends to be expressed closest to the predicate, then Tense, and the Mood. The treatment of TMA operators in FG gives a formalized basis to these findings.

Note that the generalization in (1) makes crucial reference to a morphological restriction: the ordering pattern for the expression of operators holds for those cases where one and the same morphological expression format is used for those operators. This is a necessary restriction given the existence of combinations of strategies such as:

English

(5) *John had gone*

In (5) Perfect Aspect is expressed with the help of an auxiliary verb, which itself carries the Tense marker. Given this fused expression, it makes little sense to ask which of the two categories is expressed closest to the predicate.

4. Complementation

After this introduction to the treatment of TMA expressions in FG, I will now show how the formal representational model just outlined predicts the representation of complement clauses.

The semantic characterization given to each of the layers in Table 1 makes it possible to classify subordinate constructions in terms of the highest layer they contain in their underlying structure (Hengeveld 1989). Since not all subordinate constructions represent full speech acts, it may be assumed that each of these layers may act as a subordinate construction, as indicated in (6):

(6) Classes of subordinate constructions in FG
Clause: $(E_1{:}[\pi_4\ \text{ILL}\ (S)\ (A)\ (\pi_3\ X_1{:}[\ldots](X_1))](E_1))$
Proposition: $(\pi_3\ X_1{:}\ [(\pi_2\ e_1{:}\ [\ldots]\ (e_1)))]\ (X_1))$
Predication: $(\pi_2\ e_1{:}\ [(\pi_1\ f_1)\ \ldots]\ (e_1))$

In the case of complementation, the nature of the underlying structure of the complement clause depends on the semantics of the complement taking predicate (Noonan 1985). Some examples are given in (7)–(9):

(7) $\text{Say}_V\ (x_1)\ (E_1)$

(8) Believe $(x_1)\ (X_1)$

(9) Bother $(x_1)\ (e_1)$

The verb *say* describes the reporting of a speech act, and thus takes a subordinate clause as its complement. The verb *believe* expresses a propositional attitude, and thus takes a subordinate proposition as its complement. The verb *bother*, finally, expresses the effects that a certain state of affairs causes in an experiencer, and thus takes a subordinate predication as its argument.

Given the association of certain classes of operators with specific layers, the representations in (7)–(9) lead to a number of predictions: (1) in complements of the verb *say* all classes of operators (from π_4 downwards) are relevant; (2) in

complements of the verb *believe* propositional and lower operators (from π_3 downwards) are relevant; (3) in complements of the verb *bother* predicational and lower operators (from π_2 downwards) are relevant. In what follows I investigate these claims for Spanish. The relevant basic examples are given in (10)–(12):

Spanish

(10) *Dice que Juan está enfermo*
says that Juan is:IND ill
'He says that Juan is ill'

(11) *Cree que Juan está enfermo*
believes that Juan is:IND ill
'He believes that Juan is ill'

(12) *Le molesta que Juan esté enfermo*
him bothers that Juan is:SUBJ ill
'It bothers him that Juan is ill'

On the basis of the first prediction made above, one would expect the verb *decir* 'say', but not the verb *creer* 'believe', to allow the embedding of speech acts with different illocutionary values. That this is indeed the case is shown by examples (13) and (14):

(13) *Dice que si Juan está enfermo*
says that if Juan is:IND ill
"He says that if Juan is ill"
'He asks whether Juan is ill'

(14) **Cree que si Juan está enfermo*
believes that if Juan is:IND ill
"He believes that if Juan is ill"
'He believes whether Juan is ill'

Example (13) shows that it is possible for the verb *decir* 'say' to take an interrogative complement, which is not allowed with the verb *creer* 'believe' in (14).

On the basis of the second prediction, one would expect it to be possible to express a propositional attitude within the complement of the verb *creer* 'believe', but not in that of the verb *molestar* 'bother'. This prediction is confirmed in examples (15) and (16):

(15) a. *No cree que Juan esté enfermo*
not believes that Juan is:SUBJ ill
'He does not believe that Juan is ill'

b. *No cree que Juan está enfermo*
not believes that Juan is:IND ill
'He does not believe that Juan is ill'
(but I know he is)

(16) a. *No le molesta que Juan esté enfermo*
not him bothers that Juan is:SUBJ ill
'It does not bother him that Juan is ill'

b **No le molesta que Juan está enfermo*
not him bothers that Juan is:IND ill
'It does not bother him that Juan is ill'
(but I know he is/but it bothers me he is)

In negative contexts the verb *creer* 'believe' may take subjunctive or indicative complements. By the use of an indicative complement the speaker indicates he does believe what the subject of the main clause does not believe. By the use of a subjunctive complement, however, he does not commit himself to the content of the complement proposition. In the complements of the verb *molestar* 'bother' the indicative/subjunctive opposition cannot be used in this way.

A comparison of examples (12) and (17) shows that it is possible to express temporal oppositions within the complement of the verb *molestar* 'bother', as expected on the basis of the third prediction:

(17) *No le molesta que Juan estuviera enfermo*
not him bothers that Juan was:SUBJ ill
'It does not bother him that Juan was ill'

The hypothesis, which followed from our treatment of TMA-operators within a semantically based underlying representation of the utterance, thus leads to a number of strong predictions concerning the expressibility of these operators in various types of complement clauses.

These varying possibilities have their consequences for the way in which these complements are expressed crosslinguistically. These possibilities may be captured by the implicational hierarchy given in (18):

(18) The higher the outermost layer of a complement clause, the more likely it is to be expressed by an independent verbform:

$(e_1) > (X_1) > (E_1)$

The term "independent verbform" in (18) is used to designate a verbform that may be used in independent clauses. This functional term is used instead of the formal term "finiteness" to avoid the many problems involved in defining the latter notion.

Table 2 exemplifies the way the hierarchy in (18) is instantiated in some European languages:

Table 2. *Expression of Complement Clauses (– = Independent Verbform, + = Dependent Verbform)*

Language	Predication *Bother*	Proposition *Believe*	Clause *Say*
Greek	–	–	–
Armenian	+/–	–	–
Danish	+/–	+/–	–
Finnish	+/–	+/–	+/–

As Table 2 shows, the distribution of complement types follows the implicational hierarchy in (18) in two ways: (1) the use of an independent verbform in a lower level complement implies the use of such a verbform in higher level complements, (2) the use of a dependent verbform in a higher level complement implies the use of such a verbform in lower level complements. The treatment of subordinate constructions in FG thus gives a formalized basis to Lehmann's (1988) desententialization scale.

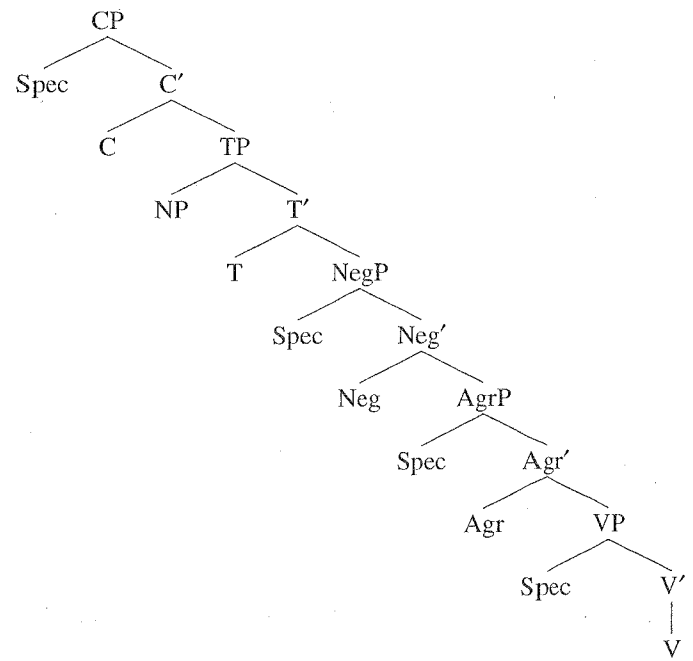
What this analysis of complement clauses has shown in relation to the analysis of TMA systems in the previous section is, then, that the use of a formal representational system helps one to fruitfully formulate hypotheses for the analysis of one domain of grammar on the basis of the results of the analysis of another domain of grammar.

5. Tense, Mood, and Aspect in Government and Binding Theory

Given that our formalized approach to grammatical theory is well motivated, the question is why one would take a functional and not an autonomous view of language. In order to answer this question, it may be useful to return to the treatment of TMA systems, and compare the FG approach to the one currently advocated in Government and Binding Theory.

With Pollock's (1989) "split-Infl hypothesis", TMA-expressions are assigned their own functional projections in underlying GB representations. The basic idea behind the GB approach is that every TMA category has its own projection in the underlying structure. By moving the verb from its original position to the positions of the various projections, it picks up the various TMA-markers one by one. The underlying structure therefore reflects the order in which TMA-markers are expressed. An example of a representation as presented by Pollock (1989) is given in (19):

(19)



As appears from (19), and more elaborate representations in later proposals, the introduction of functional categories in GB theory creates a strong parallel between this structurally based theory on the one hand and functionally based theories such as RRG and FG on the other. Since the structural realization of TMA-categories has a semantic basis, as illustrated above, the semantic approach in FG and the structural approach in GB lead to highly comparable results.

There is, however, a major difference between the approaches that is a direct reflection of the semantic vs. structural basis of their underlying represen tations. The

major difference between (19) as compared to the FG-model given in Figure 2, is that not only TMA-categories are captured by means of functional projections, but agreement, too.

Crosslinguistically, very little can be said about the position of agreement-markers in relation to TMA-markers. As a result, even for two languages as closely related as English and French it is impossible to assign a unique position to Agreement and Tense with respect to each other. Thus, Belletti (1990) proposes the inverse order for Tense and Agreement in (19). Whatever the solution adopted, for some language some type of therapeutic measure is required in order to get the verb associated with Tense and Agreement in the correct way.

This problem is a direct consequence of the fact that structural elements form the basis for a GB analysis. Since agreement is one of the categories marked on the verb, it has to be assigned a functional projection, which then leads to the problem of crosslinguistic generalization just outlined.

In FG, on the other hand, semantic categories are the basis for analysis. TMA-categories can be defined with respect to each other in terms of their semantic scope, and these scope relations are reflected in the order of the operators in underlying structure and of the elements expressing these operators in surface structure. Agreement cannot be defined in terms of semantic scope relative to TMA categories, and is therefore not treated in the same way. In FG agreement is dealt with in terms of a particular relation between a predicate and its arguments, the expression of which is handled in a separate part of the expression rule component. As a result, the description allows for a systematic and crosslinguistically valid account of the expression of TMA-categories.

6. Conclusion

In this paper I have tried to show that "formal" and "functional" are not contradictory, if "formal" is understood in the sense of "formalizing". Formalizing theories have the ability to generate explicit testable hypotheses about grammatical structure. Functional theories have the advantage of using language-independent basic semantic notions that allow for crosslinguistic generalizations. A formal-functional theory thus combines the strongest points of formal and functional approaches.

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