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HIERARCHICAL RELATIONS AND PREDICATE STRUCTURE: DERIVATION AND EMBEDDING IN A FUNCTIONAL GRAMMAR OF HUNGARIAN

0. Introduction

It appears that in natural languages it is possible to derive lexical forms from others. In a process of derivation the input is considered 'the original form' and the output 'the derived form'. We may therefore say that the relation between the input and output forms is a hierarchical relation. Consider for instance:

(1)   original form → derived form
             happy   *happiness*
             keep   *keeper*
             subject   *subjecthood*

Another hierarchy which is also relevant to all languages concerns sentence embedding. It seems that all natural languages have verbs which take a clause as one of their complements. Consider for instance (2) where the embedded clauses function as the object of the main clause:

(2) a. *John saw, that Peter travelled to Tallinn by boat.*
    b. *Mary notices, that the shop is closed.*

The relation between main clauses and complement clauses is again a hierarchical relation.

Although these two hierarchies apply to different linguistic domains, they are both relevant to predicate structure. This may justify a discussion of some aspects of both phenomena in one paper.

Since derivation and embedding occur in all languages we may require of a linguistic theory that it accounts for the hierarchical relations involved. This paper presents the Functional Grammar view on derivation and embedding by discussing relevant examples from Hungarian.[1]

The paper is organized as follows: section 1 presents an outline of Functional Grammar (FG), sections 2 and 3 discuss aspects of predicate formation and embedded predication respectively. General conclusions are given in section 4.

1. Functional grammar

1.1. The senses of functional

FG wishes to be a theory of the organization of natural languages which is 'functional' in at least three different, though interrelated senses: (I) it takes a functional view on the nature of language; (II) it attaches

primary importance to functional relations at different levels in the organization of grammar; (III) it wishes to be practically applicable to the analysis of different aspects of language and language use.

From the functional point of view one wishes, whenever this is possible, to understand why languages are organized as they are, in the light of the way they are used. FG therefore seeks for functional explanations to account for structural properties of languages. A functional explanation of a linguistic phenomenon is a statement in which that phenomenon is shown to follow from one or more principles which crucially refer to any of the functional prerequisites imposed on natural languages. It seems that functional explanations are complex and never simple in the sense of directly accounting for a linguistic phenomenon X in terms of 'THE' function of X (Cf. Dik 1986).

In this light, the following standards of adequacy are of particular importance for the theory of FG:

(I)   Typological adequacy: the theory should be formulated in terms of rules and principles which can be applied to any type of natural language.
(II)   Pragmatic adequacy: what the theory says about a language should be such as to help us understand how linguistic expressions can be effectively used in communicative interaction.
(III) Psychological adequacy: what the theory says about a language should be compatible with (what is known about) the psychological mechanisms involved in natural language processing.

1.2. The status of functional relations

In FG, functional notions play essential and fundamental roles at different levels of grammatical organization. Many of the rules and principles of FG are formulated in terms of functional notions. Three types or levels of functions are distinguished:

(I)   Semantic functions (Agent, Goal, Recipient, etc.) which define the roles that participants play in states of affairs, as designated by predications.
(II)   Syntactic functions (Subject and Object) which define different perspectives through which states of affairs are presented in linguistic expressions.
(III) Pragmatic functions (Theme and Tail, Topic and Focus) which define the informational status of constituents of linguistic expressions. They relate to the embedding of the expression in the ongoing discourse, that is, are determined by the status of the pragmatic information of Speaker and Addressee as it developes in verbal interaction.

The semantic functions are coded in the predicate-frames which underlie the construction of predications; syntactic and pragmatic functions are added to the constituents of a predication by later assignments.

1.3. Theoretical constraints

FG aims at a maximum of practical applicability in the analysis of diverse aspects of language and language use. An attempt is made to reach this goal by (I) maximizing the degree of typological adequacy, while (II) minimizing the degree of abstractness of linguistic analysis. By degree of abstractness is meant the distance (as measured in terms of rules, operations, or procedures) between the structures postulated for a given language on the basis of the theory, and the actual linguistic expressions of that language which are reconstructed in terms of these structures. Constraints restricting the degree of abstractness are:

(I)   transformations in the sense of structure-changing operations are avoided;
(II) empty elements in underlying structure which do not receive expression are avoided;
(III) filter devices are disallowed;
(IV) abstract lexical decomposition is not applied (instead the semantic relations between words are accounted for through meaning definitions).

1.4. Overall layout of FG
The overall layout of FG can be indicated globally as follows:

(I)   the **f u n d**, which consists of sets of **p r e d i c a t e s** (expressions designating properties or relations) and sets of **t e r m s** (expressions designating entities);

(II) the **p r e d i c a t i o n s** (expressions designating States of Affairs), which are structures created by combining predicates and terms;

(III) the assignment of **s y n t a c t i c** and **p r a g m a t i c** functions;

(IV) **e x p r e s s i o n   r u l e s**, which map predications onto linguistic expression.

predicates	—	terms

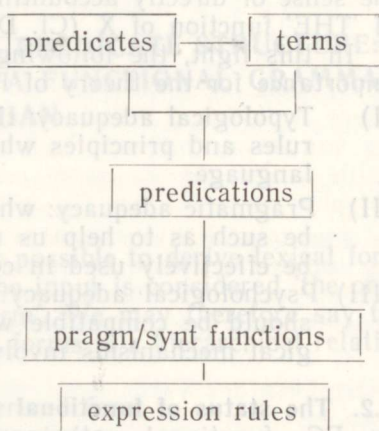predications

pragm/synt functions

expression rules

Figure 1. Organization of a Functional Grammar

1.6. Predicates and predicate-frames
Predicates are expressions designating properties or relations. They are contained in predicate-frames, structures which specify their fundamental semantic and syntactic properties, such as (I) the syntactic category of the predicate (Verbal, Nominal, Adjectival), (II) the number of arguments, (III) the semantic functions of the arguments (Agent, Goal, Recipient etc.). Predicate-frames are mental constructs. Consider the following example:

(3) $give_v$ $(x_1)_{Ag}$ $(x_2)_{Go}$ $(x_3)_{Rec}$

The order in which the predicate and the arguments are given has no direct or necessary relation to the linear order in which these constituents will finally be realised. Predicate-frame (3) could just as well be given in another linear form or in a two or three dimensional form. The representation of predicate-frame (3) is purely a matter of convention.

Nuclear predicate-frames can be extended by satellites (non-arguments). The semantic functions of arguments express the relations between the predicate and the arguments; the semantic functions of satellites express the relation between the state of affairs (designated by the predicate-frame) and the satellites. Consider:

(4) $[buy_v$ $(x_1)_{Ag}$ $(x_2)_{Go}]_{ACTION}$ $(y_1)_{Loc}$

1.6. Terms
The variables indicating the arguments and satellites can be replaced by terms, i. e. the forms underlying referring expressions. Terms can be formed by the following general schema:

(5) $\qquad$ $(\Omega x_i : \Phi_1(x_i) : \Phi_2(x_i) : \ldots : \Phi_n(x_i))$

Here x_i is the term variable symbolizing the intended referent of the term; the symbol Ω indicates one or more term operators (operators for definiteness, number etc.); each $\Phi(x_i)$ indicates some 'open predication in x_i', that is, a predicate-frame all of whose argument positions have been bound except for x_i. Each open predication in x_i can be regarded as a restrictor specifying some property which x_i must have in order to qualify as a potential referent of the term.

If term insertion is applied to all open slots of a given predicate-frame, the result is a (closed) predication.

(6) $\quad$ buy_V $(d1x_i : Peter_N(x_i))_{Ag}$ $\quad$ $(i1x_j : coat_N (x_j) : new_A(x_j))_{Go}$
$\qquad$ $(d1x_k : market_N (x_k))_{Loc}$

1.7. Predication

Nuclear predications consist of predicates and terms. Terms refer to entities in some world, and predicates designate properties of, or relations between such entities. A predication as a whole designates a set of states of affairs. The term state of affairs (SoA) is used in the broad sense of 'conception of something which can be the case in some world'.

SoAs can be divided into different types, according to the values which they can have for a number of distinguishing parameters. These parameters and their different values together define a semantic cross-classification of SoAs. The most important semantic parameters defining the typology of SoAs are: $+/-$ Dynamic; $+/-$ Momentaneous; $+/-$ Control; $+/-$ Telic. A SoA is Dynamic if any kind of change is involved, Momentary if it lasts only a moment of time, Controlled if there is some controlling entity, and Telic if it presupposes a natural end-point.

Predicate-frames designate the sets of SoAs. Which sets are designated is, however, partly determined by the predicates themselves. Predicates can be characterized in terms of the parameters determining the typology of SoAs (cf. De Groot 1985). I shall refer to the specifications the predicates have for the SoAs which they can designate as 'features of predicates'. A distinction can be made between two types of features: (I) inherent features, [dyn] and [mom], and (II) contingent features, [con] and [tel]. The inherent features [dyn] and [mom] can be associated with the lexical properties of the predicates, whereas the contingent features can be associated with arguments or satellites of predicates. In relevant cases, I shall use the following notational convention for indicating the relation between the features and the predicate-frames:

(7) $\qquad$ $[+dyn], [-mom]read_V ([+con]x_1)_{Ag} ([\pm tel]x_2)_{Go}$

Predicate operators specify the predicate for grammatical distinctions such as Polarity, Tense, Aspect, and Mood. Consider the following example:

(8) a. *Peter did not buy a new coat.*
$\quad$ b. $\text{Neg Past } buy_V (Peter)_{Ag} (a \ new \ coat)_{Go}$

Predications can be provided with an illocutionary operator, such as Declarative, Interrogative and Imperative. Consider:

(9) a. *Did Peter buy a new coat?*
$\quad$ b. $\text{Int } [\text{Past } buy_V (Peter)_{Ag} (a \ new \ coat)_{Go}]$

1.8. Pragmatic function assignment

By pragmatic functions we understand functions which specify the informational status of the constituents involved in the wider communicative setting in which they occur. Alternative assignments of pragmatic functions are sensitive to the Speaker's estimate of the pragmatic infor-

mation of the Addressee at the moment of speaking. Consider the following two alternative expressions of one and the same underlying predication:

(10) a. *Peter gave the flowers to his MOTHER.*
     b. *Peter gave the FLOWERS to his mother.*

The different intonational contour must be due to a different assignment of pragmatic functions.

FG distinguishes between the pragmatic functions external to the predication proper, e.g. Theme and Tail, and the pragmatic functions internal to it, e. g. Topic and Focus. Consider:

(11)   *That new coat, he bought it on the market, Peter.*
        Theme   Predication   Tail

The Theme specifies the universe of discourse with respect to which the subsequent predication is presented as relevant; the Tail presents, as an 'afterthought' to the predication, information meant to clarify or modify it. The Topic, one of the pragmatic functions internal to the predication proper, presents the entity/entities 'about' which the predication predicates something in a given setting ('he' and 'it' in (11)). The focus presents what is relatively the most important or salient information in a given setting ('on the market' in (11)).

A distinction is made between several sub-types of Topic and Focus. Relevant sub-types of Topic seem to be (I) Discourse Topic, (II) New Topic, (III) Given Topic, (IV) Resumed Topic, (V) Sub-Topic. Relevant sub-types of Focus are (I) Completive Focus, (II) Expansive Focus, (III) Selective Focus, (IV) Restrictive Focus, (V) Replacive Focus.

1.9. Syntactic function assignment

Syntactic functions express the perspective in which a certain SoA is presented. The following two linguistic expressions are assumed to be based on the same underlying predication, and thus designate the same set of SoAs. A difference between these two expressions is that in (12a) the SoA is presented from the point of view of 'the man' and in (12b) from the point of view of 'the car'.

(12) a. *The man ordered the car.*
     b. *The car was ordered by the man.*

Such differences are accounted for by assigning the syntactic functions of the Subject (primary vantage point) and the Object (secondary vantage point) to certain terms in an underlying predication. Compare:

(13) a. Past $order_V$ $(d1x_i : man_N (x_i))_{AgSubj}$ $(d1x_j : car_N (x_j))_{GoObj}$
     b. Past $order_V$ $(d1x_i : man_N (x_i))_{Ag}$ $(d1x_j : car_N (x_j))_{GoSubj}$

In a similar way, Object assignment is used to differentiate between the constructions such as:

(14) a. $Peter_{AgSubj}$ *gave the* $flowers_{GoObj}$ *to his* $mother_{Rec}$
     b. $Peter_{AgSubj}$ *gave his* $mother_{RecObj}$ *the* $flowers_{Go}$

Languages differ with respect to the assignment of Subj and Obj. Many languages do not have an opposition of the type (14a-b), and thus have no need for alternative Object assignment. Some languages do not have oppositions of the type (12a-b), and thus need no Subject assignment. De Groot (1981) claimed that neither Subject function nor Object function in the sense described here are relevant to a description of Hungarian.

Languages differ with respect to the degree to which differences in perspective can be systematically effected through Subject and Object assignment. The variation across languages has been taken to be describable in terms of the following Semantic Function Hierarchy:

(15)

	Ag	Go	Rec	Ben	Instr	Loc	Time
Subj	+ >	+ >	+ >	+ >	+ >	+ >	+
Obj	+ >	+ >	+ >	+ >	+ >	+

This schema indicates that Agent terms are the first candidates for Subject assignment, then come the terms with Goal, Recipient etc. The same holds for Object assignment with respect to Goal, Recipient etc.

The assignment of a syntactic function to a term has a number of consequences for the formal expression of the underlying predication, such as case marking, voice, agreement and linear ordering of constituents.

1.10. Expression rules

Expression rules determine the way in which functional structures are mapped onto morpho-syntactic structures of linguistic expressions. The following expression devices can be distinguished:

(16) (I) the form in which terms are realized, in particular by:
(a) case marking, (b) adpositions, (c) determiners;
(II) the form in which the predicate is realized, in particular with respect to:
(a) voice differences, (b) tense, mood, aspect, (c) illocution, (d) auxiliary elements, (e) agreement and cross-reference;
(III) the order of constituents;
(IV) stress and intonation.

The actual ordering patterns found in a language are taken to be the result of a number of principles. Some of them are:

(17) a. A language makes a basic choice between Prefield and Postfield ordering of the dependents with respect to their Center (= Predicate, Head Noun, or Adjective).
b. The Subject position precedes the Object position.
c. There is a universally relevant clause-initial special position Pl, which is used for special purposes, including the placement of constituents with Topic or Focus function.
d. Other things being equal, constituents prefer to be placed in order of increasing complexity, where the complexity of constituents is defined as follows:
(18) Clitic < Pronoun < Noun Phrase < Adpositional Phrase < Subordinate clause.

The hierarchy given in principle (d) is usually referred to as LIPOC (Language Independent Preferred Order of Constituents).

An example of a fully specified predication is:

(19)   DECL [PAST buy_V (d1x_i: $Peter_N$ (x_i))$_{AgSubjTop}$
(i1x_j: $coat_N$ (x_j): new_A (x_j))$_{GoObjFoc}$]
(d1x_k: $market_N$ (x_k))$_{LocTail}$
Peter bought A NEW COAT, on the MARKET

2. Predicate formation

2.1. Predicate-frames and derivation

Language users have a large number of basic predicates at their disposal. Basic predicates are those which a language user must know in order to be able to use them. We can refer to the collection of basic predicates of a language as the lexicon of a language. The set of basic predicates can be extended by a set of derived predicates by means of a number of synchronically productive rules: predicate formation rules.

First, consider the following examples of Hungarian:

(20)   *Mari szép.*
         Mary pretty
         'Mary is pretty'.
(21)   *Mari szép-ül.*
         Mary get pretty
         'Mary gets pretty.'
(22)   *A kozmetikus   szép-ít-i Mari-t.*
         the beauty specialist beautify Mary-acc
         'the beauty specialist beautifies Mary'.
(23)   *Feri szép-ít-tet-i Mári-t   a   kozmetikus-sal.*
         Feri have beautify Mary-acc the beauty specialist-instr
         'Feri has the beauty specialist beautify Mari'.

The relation between the predicates used in these examples is a relation of productive derivation. Examples of other such quartets are for instance: *rövid* 'short' — *rövidül* 'become shorter' — *rövidít* 'shorten' — *rövidíttet* 'make shorten', *szabad* 'free' — *szabadul* 'be set free' — *szabadít* 'liberate' — *szabadíttat* 'have liberate', *vak* 'blind' — *vakul* 'become blind' — *vakít* 'put somebody's eyes out' — *vakíttat* 'have someone put somebody's eyes out', *mély* 'deep' — *mélyül* 'get deeper' — *mélyít* 'deepen' — *mélyíttet* 'make deepen', *kék* 'blue' — *kékül* 'turn blue' — *kékít* 'make blue' — *kékíttet* 'have make blue'.

These examples illustrate that (I) different forms can be derived from one predicate (see (24)), and (II) predicates can be derived from basic predicates but also from derived predicates (see (25)):

(24)   *szép*   'pretty'   → *szépül* 'get pretty'
                              → *szépít* 'beautify'
(25)   *szépít* 'beautify' → *szépíttet* 'have beautify'

An account of the relation between the predicates in (24) and (25) merely in terms of 'stem/root + affix' is, of course, not sufficient, because it does not do justice to relevant properties such as valency, as well as to the relation between the predicates and the states of affairs which they can designate. Recall, however, that all predicates are contained in predicate-frames, structures which specify their fundamental semantic and syntactic properties. It is therefore claimed that predicate formation rules take predicate-frames as input and generate predicate-frames as output (Dik 1980). The input of a predicate formation rule can consist of basic and derived predicate-frames.[2] The output predicate-frames of a predicate formation rule are necessarily derived. Predicate formation can schematically be represented as follows:
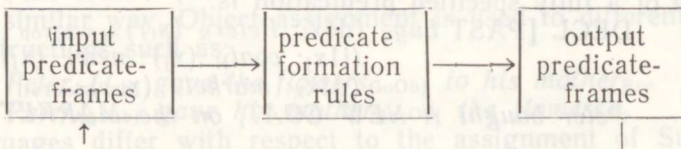
input predicate-frames	→	predicate formation rules	→	output predicate-frames

Figure 2. Predicate formation

2.2. Predicate formation rules

Predicate formation rules may have different sorts of effects on the input predicate-frame. The most important effects are given in (26):
(26) (I)   Effects on the valency of the predicate:
             — valency extension,
             — valency reduction.
      (II) Effects on the set of SoAs the predicate designates;
      (III) Other effects on the input predicate-frame:

— semantic function shift of the arguments of the predicate,
— semantic modification of the predicate,
— change in the syntactic category of the predicate.

The following predicate formation rules may account for the relation between predicates such as *szép* 'pretty' and *szépül* 'get pretty' and *szépít* 'beautify' (see (24)):

(27)   Deadjectival predicate formation in Hungarian
    input: [-dyn] $pred_A$ ([-con] $x_1)_\Phi$
    output 1:   [+dyn] $pred$-D_V ([-con], [±tel] $x_1)_{Proc}$
                  $D = $-$ul/$-$ül$
    meaning: 'the property expressed by $pred_A$ is presented as coming about through a process'
    output 2:   [+dyn] $pred$-D_V ([+con] $x_2)_{Ag}$ ([±tel] $x_1)_{Go}$
                  $D = $-$it$
    meaning: 'x_2 brings it about that the property expressed by $pred_A$ applies to x_1'

The effects of these rules are that (I) the categorial status of the output predicates is Verb, (II) the inherent feature of those predicates is [+dyn], (III) one of the arguments is bound by the feature [tel], and (IV) the marker -D is added to the input predicate to signal the deadjectival status of the output predicate.

The relation between predicates such as those given in (25) can be accounted for by a causative predicate formation rule such as (28). Note that the input of such a rule can take basic and derived predicates as long as they fulfil the requirements of the input predicate-frame. Some examples of causative predicates derived from basic predicate-frames are: *sétál* 'walk' — *sétáltat* 'take for a walk', *olvas* 'read' — *olvastat* 'have read', *tart* 'hold' — *tartat* 'have hold', *ül* 'sit' — *ültet* 'have sit down'.

(28)   Causative predicate formation in Hungarian
    input: $pred_V$ ([+ con] x_1) ... (x_n)
    output: $pred$-E_V ([+con] $x_0)_{AgCauser}$ ($x_1)_{Causee}$ ... (x_n)
               $E = $-$(t)at/$-$(t)et$
    meaning: 'x_0 brings it about that the state of affairs designated by the input predicate-frame takes place'

Note that this rule accounts, inter alia, for the introduction of the causative formative suffix and the extra argument. It also accounts for there being different controllers of the state of affairs designated by the input and output predicate-frames. Compare (29)a and (29)b, where *szándékosan* 'intentionally' depends on the will of Mari in (29)a, and on the will of Péter in (29)b:

(29) a. *Mari szándékosan   kimos-t-a   a   ruhák-at.*
      Mary intentionally wash-past-3s the clothes-acc
      'Mary intentionally washed the clothes'.
    b. *Péter szándékosan   kimos-at-t-a   a   ruhák-at   Mari-val.*
      Peter intentionally wash-caus-past-3s the clothes-acc Mary-instr
      'Peter intentionally had Mary wash the clothes'.

2.3. Derived predicates are complex

In the former section we have seen that a predicate formation rule may take both basic and derived predicate-frames as its input. This does not hold for all predicate formation rules. Consider the following intransitive predicate formation rule in Hungarian which takes 'two-place action predicates' as input.

(30)   Intransitive predicate formation in Hungarian
    input: $pred_V$ [(+con) $x_1)_{Ag}$ ([±tel] $x_2)_{Go}$
    output: $pred$-R_V ([-con], [±tel] $x_2)_{Proc}$

$$R = -ódik/-ődik$$

meaning: 'the predicate pred$_v$ is relevant only to (x_2)'

This predicate formation rule accounts for the relation between predicates such as: *rak* 'put' — *rakódik* 'be deposited', *csinál* 'make' — *csinálódik* 'be done', *pácol* 'pickle' — *pácolódik* 'be in the process of pickling', *ír* 'write' — *íródik* 'be written', and *elad* 'sell' — *eladódik* 'be sold'

Output 2 predicate-frame of rule (27) in section 2.2 is of the same form as the input predicate-frame of rule (30). We may thus expect that derived predicates such as *szépít* 'beautify' can form the input of the intransitive predicate formation in Hungarian. This expectation is wrong. Hungarian does not allow the following formation:

(31)   *szépít* 'beautify'   → **szépít-ődik*
         szabadít 'liberate'   → **szabadít-ódik*
         rövidít 'shorten'   → **rövidít-ődik*
         vakít 'put somebody's eyes out' → **vakít-ódik*

A straightforward explanation for the fact that Hungarian does not allow the formation of forms such as *szépít-ődik* may be that Process predicates can directly be derived from Adjectival predicates: *szép* 'pretty' → *szép-ül* 'get pretty' (see (27) output 1). The production of predicates such as *szépít-ődik* is not blocked by a morphological constraint on input predicates, i.e. predicates in *-ít* are not allowed as input, because the following pair of predicates is found in Hungarian:

(32)   *számít* 'count'   → *számít-ódik* 'be counted'

Note that *számít* 'count' differ from predicates such as *szépít* 'beautify' in that the former originates from a Nominal predicate and the latter from an Adjectival predicate. Consider:

(33) a. *szám$_N$* 'number'   → *számít$_V$* 'count'
     b. *szép$_A$* 'pretty'   → *szépít$_V$* 'beautify'

In order to use the appropriate Process predicate formation rule (27) or (30) a speaker of Hungarian must know whether the input predicate is a basic verbal predicate or a derived deadjectival predicate. We may thus conclude that predicate formation rules are preserved in derived predicates, and, therefore, that derived predicate-frames are more complex than basic predicate-frames.[3]

3. Embedding

3.1. Predicate-frames and predication

Terms are defined as structures with referential potential. The referent may be an entity or an event. In the latter case the term may consist of a predication. We will call this embedded predication. Consider the following example:

(34) $(x_j$ *see$_V$* $(x_i)_{Ag}$ [PREDICATION] $(x_j))_{Go}$
        John saw that Mary went to the library.

PREDICATION indicates a position in which a full new predication can be inserted, expressing the content of what is seen. Note that the second argument will thus be a term referring to some event x_j, where this event is described as a predication. A term referring to an event may in principle be any term in a predication. The sections 3.2 up till 3.5 will present examples from Hungarian.

3.2. First argument

First argument positions of verbal and non-verbal predicates can accommodate a predication. Consider:

(35) a. PRES *tűnik$_V$* $(x_j$: [PAST *elmegy$_V$* $(d1x_j$: *János* $(x_j))_{Ag}$] $(x_i))_\varphi$

b. *Úgy tűnik, hogy János elment.*
   so appear that John left
   'it appears that John has left'.
(36) a. PRES *fontos*$_V$ (x_i: [PAST *elmegy*$_V$ (d1x_j: *János* (x_j))$_{Ag}$] (x_i))$_\varphi$
   b. *Az fontos, hogy János elment.*
   that important that John left
   'it is important that John left'.

3.3. Second argument

Verbal and also nominal predicates can take a predication as their second argument:
(37) a. PAST *mond*$_V$ (d1x_k : *Péter* (x_k))$_{Ag}$
   (x_i: [PAST *elmegy*$_V$ (d1x_j: *János* (x_j))$_{Ag}$] (x_i))$_{Go}$
   b. *Péter mondta hogy János elment.*
   Peter said that John left
   'Peter said that John had left'.
(38) a. *terv*$_N$ (x_i)$_\varphi$ (x_k: [PRES *jön*$_V$ (d1x_j: *János* (x_j))$_{Ag}$] (x_k))$_\varphi$
   b. *A terv, hogy János jön.*
   the plan that John come
   'the plan that John comes'.

3.4. Satellite

Satellite positions can also consist of predications. I will give two examples here:
(39) a. PAST *becsuk*$_V$ (d1x_m: *Mari* (x_m))$_{Ag}$ (d1x_k: *ablak*$_N$ (x_k))$_{Go}$
   (y_i: [PAST *elmegy*$_V$ (d1x_j: *János* (x_j))$_{Ag}$]
   (y_i))$_{Temp}$
   b. *Mielőtt János elment, Mari bescukta az ablak-ot.*
   before John left Mary closed the window-acc
   'Mary closed the window before John left'.
The next example displays a non-finite adverbial construction which is represented as an embedded predication semantically functioning as a circumstancial satellite of the main predication.
(40) a. PAST *sétály* (dmx$_i$: *gyerek*$_N$ (x_i))$_{Ag}$
   (y_i: [*beszélget*$_V$ (Ax_i)$_{Ag}$] (y_i))$_{Circ}$
   b. *A gyerekek beszélget-ve sétáltak.*
   the children talk-PART walked
   'the children walked, talking'.
Note that one of the arguments of the embedded predicate is coreferential with one of the arguments of the matrix predicate. We can say that the coreferential argument has an anaphoric status: it is a case of 'zero-anaphora' (A indicates Anaphora).

3.5. Predicate

Terms can also function as predicates over terms. Within the framework of FG this is accounted for by term predicate formation. A term predicate formation rule takes terms as input and delivers predicate-frames with term predicates as output (cf. Dik 1980, Ch. 4). Consider (41), where a term predicate (*a gyilkos*) applies to a term (*János*):
(41) a. PRES {(d1x_i: *gyilkos* (x_i))} (d1x_j: *János* (x_j))$_\Phi$
   b. *János a gyilkos.*
   John the killer
   'John is the killer'.
In some cases it is possible that terms which consist of a predication function as predicates. One such example is a resultative state construction in Hungarian. This construction as examplified in (43) can be analysed as (42):

(42) $\{(x_i$ [PREDICATION] $(x_i))_{Circ}\}$ $(x_j))_\Phi$

(43) a. PRES $\{(x_i: [PF \ csuk_V \ (ø)_{Ag} \ (x_j)_{Go}] \ (x_i))_{Circ}\}$ $(d1x_j: ajtó_N \ (x_j))_\varphi$

   b. *Az ajtó be van csuk-va.*
   the door PF COP close-PART
   'the door has been closed'.

Opposed to example (41) the term predicate in (43) does not refer to an entity, but to a SoA ($[+con]$, $[+dyn]$, $[\pm tel]$). The fact that this construction allows the extension of manner adverbs supports this claim (cf. De Groot 1987a):

(44)   *Az ajtó óvatosan van be-csuk-va.*
   the door carefully COP PF-close-PART
   'the door has been carefully closed'.

3.3. Expression

It appears that in natural languages there is a close correspondence between predications and certain surface structure units, clauses. Corresponding expressions of main predications are main clauses, corresponding expressions of embedded clauses are, for instance, complement clauses, relative clauses [4], adverbial clauses, and participial clauses. When two or more predications are united in one larger structure, the hierarchical relation between the predications will in those cases be indicated by certain grammatical devices, such as coordinators, subordinators, etc.[5]

In Hungarian embedded predications can be represented by a dummy element in the main clause. The semantic function of the embedded predication is marked on the dummy element by means of a case. The pragmatic function of the embedded predication (topic or focus) is marked by the position of the dummy element in the main clause. Hungarian word order can be characterized as a «Top Foc V» word order. Consider:

(45) a. PAST $mond_V$ $(d1x_k: Péter \ (x_k))_{AgTop}$

   $(x_i: [PAST \ elmegy_V \ (d1x_j: János \ (x_j))_{Ag}] \ (x_i))_{GoFoc}$

   b. *Péter az-t mondta hogy János elment.*
   Peter dummy-acc said that John left
   'Peter said that John had left'.

The basic form of the dummy is *az* 'that-nom'. The Goal function triggers the accusative, thus $az+t$; The Focus function triggers the position, i. e. the position immediately preceeding the verb.

Conditioned by certain pragmatic rules, a constituent of the embedded predication can take the position of the dummy element. Consider (46)a and (46)b which express the same semantic contents:

(46) a. *Az-t nem hiszem, hogy Mari ismeri Feri-t.*
   that-acc not believe-I that Mary-nom knows Feri-acc
   'I do not believe that Mary knows Feri'.

   b. *Mari, nem hiszem, hogy ismeri Feri-t.*
   Mary-nom not believe-I that knows Feri-acc
   'I do not believe that Mary knows Feri'.

Note that *Mari* in (46)b is expressed by the nominative and not by the accusative. However, morphological adjustment of 'displaced constituents' does occur. Consider:

(47) a. *Az-on gondolkozom hogy Péter megvette-e a kabát-ot.*
   that-Sup.es wonder-I that Peter-nom bought-QM the coat-acc
   'I wonder, whether Peter bought the coat'

   b. *A kabát-on gondolkozom hogy Péter megvette-e.*
   the coat-Sup.es wonder-I that Peter-nom bought-QM
   'I wonder, whether Peter bought the coat'

In De Groot (1981) it is argued that the predicate-frame of predicates such

as *gondolkozik* 'wonder' in (47) is in both expressions the same. The difference between (47)a and (47)b cannot be accounted for by the assumption that there is a two-place and a three-place predicate *gondolkozik*.[6] The assignment of the superessive case to *kabát* in (47)b is an adjustment to be applied after displacement, where the displacement itself is triggered by a certain constellation of pragmatic functions. A displaced constituent, which takes the position otherwise occupied by the dummy representation of an embedded predication, will be expressed according to the semantic function of this embedded predication when it meets the selection restrictions of the argument of which the dummy was the representation. Thus the fact that the predicate *hisz* 'believe' in (46) cannot take *Mari* as its second argument, and *gondolkozik* in (47) can take *kabát* as its second argument, illustrates the relevance of predicate-frames in the analysis of embedding, displacement, and morphological adjustment in Hungarian.

4. Conclusions

This paper presented the Functional Grammar view on two types of hierarchical relations: derivation and embedding. Given the formalism of predicate-frames as defined in FG (category, valency, semantic functions, SoAs), the model accounts for derivation and embedding in the following way:

(I)   derivation: predicate formation; predicate formation rules take predicate-frames as input and generate predicate-frames as output;

(II) embedding: insertion of predications in term positions of other predications.

This approach offers an explanation for a number of aspects of derivation and embedding, such as: changes of categories, changes in valency, different distribution of features of predicates, introduction of morphemes expressing the derivational status of a predicate, or the hierarchical relation between predications.

Notes

[1] Functional Grammar as developed by Dik (1978) and others. See De Groot (1987b) for other publications within the framework of FG.

[2] Another type of input is discussed in section 3.5.

[3] Derived predicates may diachronically be reinterpreted as basic predicates. The derivational process will not be relevant in those cases.

[4] Relative clauses are represented as open predications in term structures.

[5] In this paper I have limited myself to the discussion of aspects of finite and participle clauses. Of course, much more can be said about these types of embedding and nominalization.

[6] I assume that predicates such as *lát* 'see' have two predicate-frames, which account for differences between the following two examples:

(I) *Láttam, hogy János elment.*　　　(II) *Láttam János-t elmen-ni.*
   saw-I that John left　　　　　　　　　saw-I John-acc leave-inf
   'I saw that John (had) left'.　　　　　　'I saw John leave'.

Abbreviations and symbols

Acc = Accusative; **Ag** = Agent; **Caus** = Causative; **Con** = Control; **Dyn** = Dynamic; FG = Functional Grammar; **Foc** = Focus; **Go** = Goal; **Instr** = Instrument; **Int** = Interrogative; **Loc** = Location; **Mom** = Momentaneous; **Neg** = Negative; **Obj** = = Object; **Part** = Participle; **Proc** = Processed; **QM** = Question marker; **Rec** = Recipient; **SoA** = State of affairs; **Subj** = Subj; **Sup.es** = Superessive; **Tel** = Telic; **Top** = Topic; ø = Zero; Φ = predicate; **V** = verbal; **A** = adjectival; **N** = nominal; x_i = term variable; Ω = term operator; **d** = definite; **i** = indefinite.

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КАСПЕР ДЕ ГРООТ (Амстердам)

ИЕРАРХИЧЕСКИЕ ОТНОШЕНИЯ И ПРЕДИКАТИВНАЯ СТРУКТУРА: ДЕРИВАЦИЯ И ВКЛЮЧЕНИЕ В ФУНКЦИОНАЛЬНОЙ ГРАММАТИКЕ ВЕНГЕРСКОГО ЯЗЫКА

Данная статья излагает точку зрения функциональной грамматики на два типа иерархических отношений: деривацию и включение. В параграфе 1 дается очерк функциональной грамматики, как она описана С. Ц. Диком и др. Центральным понятием ее служит предикат. Предикаты — это выражения, обозначающие свойства и отношения. Они включены в предикативные фреймы — структуры, которые определяют такие фундаментальные семантические и синтаксические свойства предикатов, как I) синтаксическая категория предиката (глагол, существительное, прилагательное), II) число аргументов, III) семантические функции аргументов (агент, пациент, реципиент). На основе многочисленных примеров из венгерского языка автор утверждает, что теория предикативных фреймов весьма пригодна для описания широкого круга фактов деривации и включения. Перечислим некоторые из них: изменения в синтаксических категориях и валентности, разное распределение некоторых свойств предикатов, применение деривационных приставок, отношения между предикацией и явлениями морфологического приспособления в т. н. конструкциях подъема.