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Jan Nuyts, A. Machtelt Bolkestein and Co Vet (eds)

Layers and Levels of Representation in Language Theory
A functional view

LAYERS AND LEVELS OF REPRESENTATION IN LANGUAGE THEORY

A FUNCTIONAL VIEW

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The Hierarchical Structure of Utterances

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0. Introduction¹

It is probably fair to say, using Halliday's (1970, 1985) tripartite classification of communicative functions, that most work in Functional Grammar (FG) (see Dik 1978, 1989) has been devoted to phenomena which are best considered as pertaining to the *ideational* and *textual* functions of language, rather than to phenomena pertaining to the *interpersonal* function of language. Correspondingly, the highest level of analysis has long been the predication, designating a State of Affairs (SoA), containing constituents which can be assigned syntactic and pragmatic functions.²

In the study of the interpersonal function of language, the focus of attention is not on the predication, embodying the ideational function of language, nor on the syntactic and pragmatic functions of the constituents of the predication, embodying the textual function of language, but it is on the utterance containing the predication. Apart from a description of a SoA, an utterance contains elements providing the addressee with information concerning the speaker's intentions in producing the utterance and his attitude towards the information he is presenting within the utterance. These elements embody the interpersonal function of language, which can be conceived of as a three-place relation between a speaker, an addressee and the content of the utterance produced by the speaker. This three-place relation is translated into a three-place predicate when it is reported:

- (1) John said to me that Peter is ill
say (John) (me) (Peter is ill)

From a meta-communicative point of view, every utterance is an instantiation of such a three-place relation, even if it is not a reported one. The nature of the relation is indicated by the illocutionary force indicating devices selected by the speaker (such as word order, intonation and sentence mood), which in (2) are

represented by the abstract predicate DECL (declarative):

- (2) Peter is ill
DECL (speaker) (addressee) (Peter is ill)

The use of abstract performative predicates to account for basic illocutions of sentences, as illustrated here, has become known, since Ross (1970), as the *performative hypothesis*. Many objections have been raised against Ross' analysis, some of which will be discussed later in this paper.

Ross embedded what in FG terms would probably be called the predication under the abstract performative predicate. If we take the predication as the unit embodying the ideational function of language, i.e. as a description of a SoA and the participants involved therein, this is not entirely correct. From an interpersonal point of view, what is governed by the abstract performative predicate is the propositional content of the speech act, not the description of a SoA as such. Unlike SoAs, propositional contents can be asserted, known, denied or questioned, i.e. "they are entities of the kind that may function as the objects of such so-called propositional attitudes as belief, expectation and judgement" (Lyons 1977: 445). These properties of propositional contents show that (i) they have to be separated from the illocutionary forces they may be subjected to and (ii) they have to be separated from the SoAs they describe.

The latter conclusion makes it necessary to study a predication from both an interpersonal and an ideational perspective. From an interpersonal perspective, a predication constitutes the *propositional content* of a speech act. From an ideational perspective, a predication constitutes the description of a SoA.

Other labels have been proposed to capture approximately the same distinction: Vendler (1967) uses the terms 'fact' and 'event', Barwise and Perry (1983) 'attitude' and 'situation' and Aronszajn (1988) 'thought' and 'circumstance'. To distinguish between the linguistic correlates of what all these pairs of terms describe I use the terms *proposition* and *predication*, respectively. Thus I will use *proposition* for the linguistic unit that refers to a propositional content and *predication* for the linguistic unit that refers to a SoA.

1. The representation of utterances

In Hengeveld (1988, 1989) I propose to represent utterances by means of a multi-layered hierarchical clause model, which captures the different levels of analysis discussed above. The present paper is meant to give a brief description

of the layout of this model and to discuss some of its implications. For a more elaborate account the reader is referred to the papers mentioned earlier.

The general format of the model is given in figure 1.

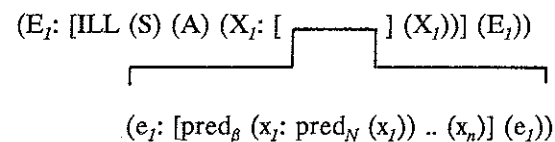


Figure 1: The representation of utterances

The structure in figure 1 as a whole gives a representation of the speech act (E_j). Within this speech act a propositional content (X_j) is processed. This propositional content contains a description of a SoA (e_j). This SoA involves several individuals (x_j) ... (x_n).

The highest level of this structure is called, following Halliday (1970, 1985), the *interpersonal level*. It is structured on the basis of an abstract illocutionary frame (ILL), which has the speaker S, the addressee A and the propositional content X_j as its arguments. The lowest level is called the *representational level*, following Bühler (1934), rather than *ideational level*, which would be in line with Halliday's terminology. This level is structured on the basis of a predicate frame, which has one or more individuals³ (x_j) ... (x_n) as its arguments.

One of the most important features of this structure, which is partly inspired by Foley and Van Valin (1984) (see also Van Valin this vol.), is that layers of lower complexity are fully contained within layers of higher complexity. For instance, every proposition contains a predication, i.e. every propositional content contains a description of a SoA. In this respect the layered approach differs from the approach followed by e.g. Vendler (1967) and Aronszajn (1988).

2. Layers, variables and frames

2.1. Layers and variables

Within the hierarchical structure presented in figure 1 four layers, each provided with its own variable, can be distinguished. All variables are followed by restrictors of decreasing complexity, which contain the main information on their respective layers.⁴ The four layers are listed in (3):

(3) General format of layers

clause:	$(E_i: [\text{ILL} (S) (A) (X_i: \text{etc.} (X_i))] (E_i))$
proposition:	$(X_i: [(e_i: \text{etc.} (e_i))] (X_i))$
predication:	$(e_i: [\text{pred}_\beta (x_i)^n] (e_i))^5$
term:	$(x_i: \text{pred}_N (x_i))$

An informal illustration of the four layers may serve to give a first approximation of the differences between them:

(4) Illustration of layers

clause:	$(E_i: \text{'Did John go?'} (E_i))$
proposition:	$(X_i: \text{John went} (X_i))$
predication:	$(e_i: \text{John's going} (e_i))$
term:	$(x_i: \text{John} (x_i))$

In (4) the yes/no-question E_i (*Did John go?*) contains the questioned proposition X_i ('John went'), within which reference is made to the SoA e_i ('John's going'), which involves a single participant x_i ('John'). Thus, layers of lower complexity are fully contained within layers of higher complexity, as is shown in figure 2.

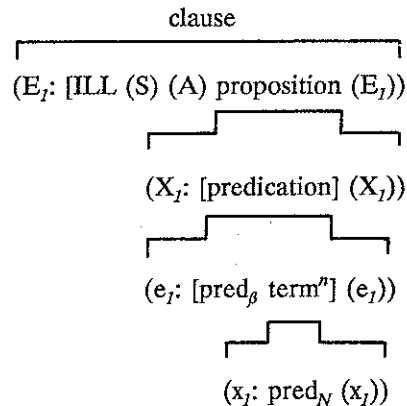


Figure 2: Nesting of layers

The format of each layer, a variable followed by a restrictor, is that proposed for terms in Dik (1978) and for predications in Vet (1986). Each layer is provided with its own variable, because each can serve as an antecedent for anaphoric reference, as is shown in Hengeveld (this vol.). A second reason to

provide each layer with its own variable is that the nature of the difference between the four layers can be understood in terms of the kinds of entity they designate, as is represented in figure 3.

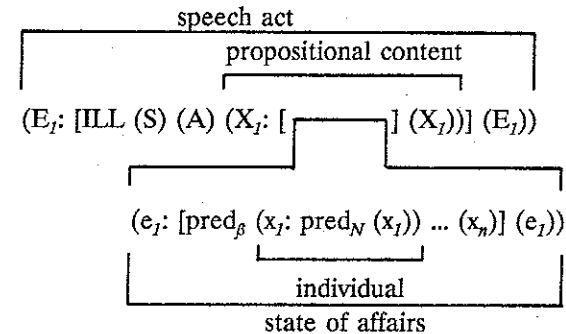


Figure 3: Designation of layers

Each of the four layers designates an entity of a different order (cf. Lyons 1977: 442-447). An *individual* is a first order entity. It can be located in space and can be evaluated in terms of its existence. A *SoA* is a second order entity. It can be located in space and time and can be evaluated in terms of its reality. A *propositional content* is a third order entity. It can be located in space nor time and can be evaluated in terms of its truth. A *speech act* is a fourth order entity. It locates itself in space and time and can be evaluated in terms of its felicity. The ways in which the different layers can be evaluated are summarized in figure 4 below.

The fact that existence, reality, truth and felicity can be said to be relevant with respect to different portions of the layered structure of the utterance has far-reaching consequences. The most important one in the present context is that it solves one of the major semantic problems which have been raised against the performative hypothesis and which has become known as the 'performadox' (Boër and Lycan 1980; see also Levinson 1983: 257). The problem centers around the truth-conditional interpretation of the (abstract or explicit) performative predicate and its optional modifications, such as illocutionary adverbs. Figure 4 offers a straightforward solution to this problem: The (abstract) illocutionary predicate is outside the domain within which the question of truth is relevant. Only the proposition is evaluated in terms of its truth.⁶ This can be demonstrated by means of the following sentences:

- (5) A: I state to you that John is ill
B: That's not true

Here the normal interpretation is that B denies that John is ill, not that he denies that A states so. This interpretation is correctly predicted by figure 4.

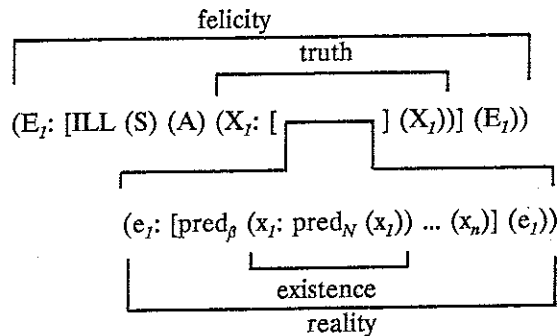


Figure 4: Evaluation of layers

2.2. Frames

Apart from the four layers discussed above, there are two types of frame, which are given in (6):

- (6) Frames
- | | |
|---------------------|---|
| illocutionary frame | ILL (S) (A) (X _j) |
| predicate frame | pred _β (x _j) ... (x _n) |

In the same way that the predicate frame provides a blueprint for the representational level, the illocutionary frame⁷ provides a blueprint for the interpersonal level. The analysis of basic illocutions in terms of illocutionary frames stresses the relational nature of speech acts, but also accounts for several aspects of their form. Many of these are listed in Ross (1970).

One of the reasons to assume that every sentence is governed by an abstract performative predicate is that this predicate⁸ can be modified by adverbs, as is illustrated in (7):

- (7) Frankly, I don't like you
(cf. I state to you frankly that I don't like you)

One of the reasons to assume that speaker and addressee are present at the same abstract level is that they may serve as antecedents for reflexives (Ross 1970) and may govern agreement relations, as is illustrated in the following Spanish examples:

- (8) *Est-oy content-o/a*
COP-PRES.1SGhappy-MASC/FEM
"I (male/female speaker) am happy"
- (9) *¿Est-ás content-o/a?*
COP-PRES.1SGhappy-MASC/FEM
"Are you (male/female addressee) happy?"

Some of the illocutionary frames to be distinguished are listed in (10):

(10) Illocutionary frames

declarative	DECL	(S) (A) (X _j)
interrogative (Q-word)	INT	(S) (A) (X _j)
interrogative (Y/N)	INT	(S) (A) (Indet X _j)
imperative	IMP	(S) (A) (e _j : [+control] (e _j))

As the last example illustrates, not all illocutionary frames have a proposition as their third argument. An imperative frame specifies a relation between a speaker S, an addressee A and the controlled SoA e_j to be realized by A. The truth value of the third argument is irrelevant in the case of imperatives and this is reflected in the absence of a propositional level, but it is relevant in the case of declaratives, Q-word interrogatives and yes/no interrogatives (in the latter only in the sense that the truth value is indeterminate (Indet) and has to be specified by the addressee).

The abstract illocutionary predicates may be replaced⁹ by *performatively used* speech act verbs, which often have a more specific value than the abstract predicates. *Reportatively used* speech act verbs are part of the propositional content, have a truth-conditional interpretation and are themselves governed by an abstract illocutionary predicate. Thus there are three different possibilities: (i) abstract performative predicate, (ii) explicit performative verb and (iii) reportative speech act verb.¹⁰ These possibilities may be represented as follows:

- (11) $(E_i: [\text{DECL (S) (A) } (X_i: [\text{John is ill} (X_i))] (E_i))$
"John is ill"
- (12) $(E_i: [\text{say}_V (S) (A) (X_i: [\text{John is ill} (X_i))] (E_i))$
"I say to you that John is ill"
- (13) $(E_i: [\text{DECL (S) (A) } (X_i: [\text{Mary said to me } (X_j: [\text{John is ill} (X_j))] (X_i))] (E_i))$
"Mary said to me that John is ill"

Note that in (12) the speech act verb is not part of the propositional content X_i of the main clause, but replaces the abstract performative predicate, whereas in (13) the speech act verb is part of the propositional content X_i of the main clause and itself governs the reported propositional content X_j .

3. Operators and satellites

One of the main goals of the hierarchical model of the utterance presented in 2. is to account for the scope relations between several types of grammatical and lexical modification. For each layer, there are particular categories of operator and satellite which serve to provide additional grammatical and lexical information on their respective layers, the main content of which is provided by the kernel structures which function as their first restrictors. For a simple example, consider the following sentence:

- (14) I saw him yesterday

In (14) both the past tense form of the verb and the adverb *yesterday* locate the SoA 'my seeing him' on the time axis. The grammatical and the lexical strategy have approximately the same function and both modify the same layer, the predication, which designates the SoA for which a temporal setting is specified.

For a second example, consider the following sentences:

- (15) John must be ill

- (16) Surely John is ill

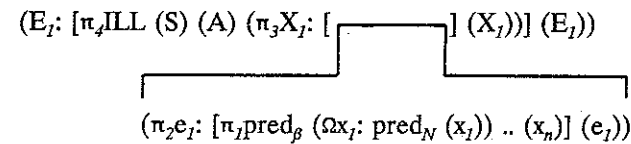
In (15) the modal auxiliary *must* indicates that the speaker commits himself to the truth of the propositional content 'John is ill', in (16) the modal adverb *allegedly* serves to indicate this. The grammatical and the lexical strategy have approximately the same function and both operate on the same layer, the proposition, which represents the propositional content to the truth of which the speaker commits himself.

The grammatical and lexical means that modify the different layers are represented within the model of the utterance by means of operators and satellites, respectively, which will be discussed separately below. The representation of (14) given in (17) illustrates the format (taken from Vet 1986) that will be used to represent them. In this case the level of representation is the predication with its grammatical and lexical modifications¹¹:

- (17) operator kernel structure satellite
(Past $e_i: [\text{see}_V (I) (him)] (e_i): \text{yesterday}_{Adv} (e_i)$)

3.1. Operators

Each layer within the utterance has its own categories of operators. Disregarding term operators (Ω), the categories listed in figure 5 may be distinguished.



- | | | | |
|-----------|-----------------------|-----------|-----------------------|
| π_1 : | predicate operators | π_3 : | proposition operators |
| π_2 : | predication operators | π_4 : | illocution operators |

Figure 5: Operators

Predicate operators (π_1) capture the grammatical means which specify additional properties of the set of SoAs designated by a bare predication. These additional properties may concern the internal temporal constituency (Comrie 1976) of the SoA (qualificational aspect), its internal spatial constituency (directionals, cf. Foley and Van Valin 1984) and the presence or absence of the property or relation expressed by the predicate (predicate negation).

Predication operators (π_2) capture the grammatical means which locate the

SoAs designated by a predication in a real or imaginary world and thus restrict the set of potential referents of the predication to the external situation(s) the speaker has in mind. This restricting function may concern the time of occurrence of the SoA (tense), the frequency of occurrence of the SoA (quantificational aspect) and the actuality of occurrence of the SoA (objective mood (realis-irrealis), polarity).

Proposition operators (π_3) capture the grammatical means through which the speaker specifies his attitude towards the (truth of the) propositional content he puts forward for consideration. The speaker may do so by specifying the source of the propositional content (evidential mood) or by specifying his personal assessment of the propositional content (subjective mood).

Illocution operators (π_4) capture the grammatical means through which the speaker modifies the force of the basic illocution of his utterance so as to make it fit his communicative strategy. The speaker may do so by mitigating the force of the speech act (mitigating mode) or by reinforcing it (reinforcing mode). The basic functions of the four types of operator may be summarized as follows:

(18) Overview of operators

- π_1 : additional properties of the SoA
- π_2 : setting of the SoA
- π_3 : validity of the propositional content
- π_4 : communicative strategy of the speaker

For some illustrations of these functions consider (19) (from Hidatsa (Siouan), Matthews 1965) and (20) (from Quechua (Andean), Cole 1982):

(19) *Wira i ápaari ki stao wareac*
 tree it grow INGR REMPAST QUOT
 "They say the tree began to grow a long time ago"

π_1 : The predicate *ápaari* is followed by the ingressive morpheme *ki*, which specifies a particular property of the SoA by focusing on a particular phase in its development.

π_2 : The remote past morpheme *stao* provides a setting for the (ingressive) SoA by locating it on the time axis.

π_3 : By means of the quotative morpheme *wareac* the speaker attributes the propositional content of the speech act (within which reference is made to remote past ingressive SoA) to a third party.

(20) *Pay-ka shamu-nga-m-ári*
 he-TOP come-FUT3-FIRSTHAND-REINF
 "He will come!"

π_2 : The predicate *shamu* is followed by the future tense morpheme *-nga*, which specifies the setting of the SoA.

π_3 : Through the evidential mood morpheme *-m* the speaker indicates he has first-hand evidence for the propositional content of the speech act (within which reference is made to a future SoA).

π_4 : Through the addition of the reinforcing mode morpheme *-ári* the speaker imposes his declarative speech act (within which a proposition for which the speaker has first-hand evidence is processed) more strongly upon the addressee.

The order of the morphemes with respect to the predicate in these examples reflects the ordering of operators within the model of the utterance and thus reflects the scope relations between the categories tense, mood and aspect expressed by these operators. This is hypothesized to be universally the case in Hengeveld (1989), in line with Foley and Van Valin (1984), Bybee (1985) and Lehmann (1988). Note, however, that the hypothesis holds for (sub)sets of operators sharing the same expression format, e.g. prefixes, suffixes, clitics or auxiliaries, only. Thus Dik (1989: 324) notes that the hypothesis should be interpreted in such a way that if operators are expressed on both sides of the predicate, both the set preceding and that following the predicate must conform to the hypothesized ordering. Below the general pattern in (21) some possible orderings of operators are given to illustrate this:

(21)	π_4	π_3	π_2	π_1	pred _{β}	π_1	π_2	π_3	π_4
a	+					+	+	+	
b	+	+				+	+		
c	+	+	+			+			
d	+		+			+		+	
									etc.

The following example (from Ngiyambaa (Pama-Nyungan), Donaldson 1980) is an illustration of such a mixed ordering of operators:

(22) *Minja-ginda=wa:=ndu-bula: buma-la-gila-nha*
 what-for=EXCLAM=you-two hit-each.other-CONT-PRES
 "What have you got to keep on fighting over?"

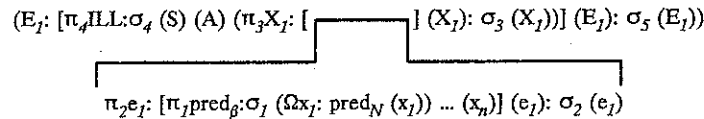
In Ngiyambaa predicate and predication operators are expressed by means of suffixes on the predicate. Examples are the continuative aspect suffix *-ŋila* (π_1) and the present tense suffix *-nha* (π_2). Most proposition and illocution operators are expressed by means of clitics on the first word in the sentence. An example is the exclamative clitic *wa:* (π_4) in (22), which has a reinforcing function. The ordering of the operators in (22) is represented in (23):

$$(23) \pi_4 \quad \pi_3 \quad \pi_2 \quad \pi_1 \quad \text{pred}_\beta \quad \pi_1 \quad \pi_2 \quad \pi_3 \quad \pi_4$$

$$+ \quad \quad \quad \quad \quad \quad \quad \quad + \quad +$$

3.2. Satellites

Just as every layer may be modified by operators, so may it be further extended by satellites (see Dik et al. this vol.), as is indicated in figure 6, in which the model of the utterance is completed.¹²



layers and frames	operators	satellites
x_I : term	Ω : term operators	
pred: predicate frame	π_1 : predicate operators	σ_1 : predicate satellites
e_I : predication	π_2 : predication operators	σ_2 : predication satellites
X_I : proposition	π_3 : proposition operators	σ_3 : proposition satellites
ILL: illocution frame	π_4 : illocution operators	σ_4 : illocution satellites
E_I : clause		σ_5 : clause satellites

Figure 6: Layers, frames, operators, satellites

The functions of these satellites are comparable to those of the corresponding operators. Thus *predicate satellites* (σ_1) specify additional properties of the SoA (e.g. Manner, Direction), *predication satellites* (σ_2) specify the spatial, temporal and cognitive setting of the SoA (e.g. Location, Time, Reason), *proposition satellites* (σ_3) are concerned with the validity of the propositional content (e.g. Attitude, Condition) and *illocution satellites* (σ_4) have to do with the speaker's communicative strategy (e.g. Manner (of speech act)). Finally, in order to

account for textual relations, there is a class of *clause satellites* (σ_5)¹³, which has no grammatical equivalent. Satellites of this class capture the lexical means through which the speaker locates his utterance within the context of the discourse and thus restricts the set of potential perlocutions of this utterance.

In summary, the basic functions of the five types of satellite may be formulated as follows:

(24) Overview of satellites

- σ_1 : additional properties of the SoA
- σ_2 : setting of the SoA
- σ_3 : validity of the propositional content
- σ_4 : communicative strategy of the speaker
- σ_5 : setting of the utterance

The following example illustrates these functions:

(25) Honestly, you certainly danced beautifully yesterday, if I may say so

This sentence can be analyzed in the following way:

- (25) a. you danced **beautifully**
- b. you danced **beautifully yesterday**
- c. you **certainly** danced beautifully yesterday
- d. **Honestly**, you certainly danced beautifully yesterday
- e. **Honestly**, you certainly danced beautifully yesterday,
if I may say so

- σ_1 : The Manner satellite *beautifully* specifies an additional property of the SoA.
 - σ_2 : The Time satellite *yesterday* specifies the setting of the SoA.
 - σ_3 : Through the Attitudinal satellite *certainly* the speaker expresses his commitment with respect to the propositional content.
 - σ_4 : Through the Manner satellite *honestly* the speaker reinforces the basic illocution of the utterance.
 - σ_5 : Through the Condition satellite *if I may say so* the speaker contemplates the felicity of the speech act within the actual communicative setting.
- In principle all five satellite types may be expressed through adverbs, although a sentence which contains five adverbs, like the following, is quite strange:

- (26) Finally (σ_5), you honestly (σ_4) certainly (σ_3) danced beautifully (σ_1) recently (σ_2)

Note that, as in the case of operators, the order in which the satellites appear reflects their position with respect to the predicate within the underlying structure of the utterance. The respective orderings of the satellites in (25) and (26) are represented in (27):

(27)	σ_5	σ_4	σ_3	σ_2	σ_1	pred _{β}	σ_1	σ_2	σ_3	σ_4	σ_5
		+	+				+	+			+
	+	+	+				+	+			

4. Subordination

So far I have mainly been concerned with simple utterances, i.e. utterances in which arguments and satellites refer to first order entities (x). In order to be able to analyze complex utterances arguments and satellites referring to higher order entities have to be accounted for.

4.1. Complements

The layers in the hierarchical model of the utterance given in figure 1 may not only be modified by operators and satellites, but may also be turned into arguments of higher predicates. Consider the following examples:

- (28) Hopefully you will pass the exam

- (29) I hope you will pass the exam

In both sentences the proposition 'you will pass the exam' is characterized as being a fulfillable wish of the speaker. In (28) this is achieved by providing it with the modal adverb *hopefully*, in (29) by turning it into the complement of the verb *hope*, as is represented in (30)-(31), respectively:

- (30) (X_i : [you will pass the exam]) (X_j : hopefully_{Adv} (X_i))

- (31) hope_V (S)_{Exp} (X_i : [you will pass the exam]) (X_j)_{Go}

Just as a proposition may be turned into the argument of a higher predicate, so may all other layers be governed by a higher predicate. For instance, utterance predicates¹⁴ used for direct speech reports have a fourth order argument, the quoted speech act; believe predicates have a third order argument, the believed propositional content; immediate perception predicates have a second order argument, the witnessed SoA. Predicates with first order arguments only, such as *give* and *read* conclude the scale. The arguments of these predicates are of decreasing internal complexity, as is shown in (32):

- (32) say_V (x_1)_{Ag} (E_j : clause (E_1))_{Go}
 believe_V (x_1)_{Exp} (X_j : proposition (X_1))_{Go}
 see_V (x_1)_{Exp} (e_j : predication (e_1))_{Go}
 read_V (x_1)_{Ag} (x_j : pred_N (x_1))_{Go}

This approach to complementation makes it possible to account for many differences in the form and behaviour of complements. With respect to differences in the form of complements, compare the following Fijian (Austronesian, Dixon 1988) examples:

- (33) Au aa tu'u-ni Eroni vei Nana Maa
 1SG PAST tell-TR Eroni REC Nana Maa
 "I told Nana Maa about Eroni"

- (34) E aa tu'u-na vei au a o-na la'o mai
 3SG PAST tell-TR REC 1SG ART CL-3SG go here
 a Koovana.levu
 ART Governor-General
 "He told me about the Governor-General's coming here"

- (35) E aa tu'u-na vei au ni na la'o mai
 3SG PAST tell-TR REC 1SG COMP FUT go here
 a Koovana.levu ni saubogi
 ART Governor-General LOC tomorrow
 "He told me that the Governor-General will come here tomorrow"

- (36) *E tu'u-na sara o Raavouvou.ni.Boumaa:*
 3SG tell-TR MODIFART Raavouvou.of.Boumaa
 "Qawa i yai a oo-taru bu'a!"
 light LOC here ART CL-1INCL fire
 "The Raavouvou of Boumaa told him: "Let our fire be lighted here!"

The Fijian verb *tu'una* "tell (about)" can take four different types of Goal argument. The Goal argument in (33) designates a first order entity, the person told about. It takes the form of a noun phrase. The Goal argument in (34) designates a second order entity, the event told about. It takes the form of a nominalization, introduced by the article *a*. The Goal argument in (35) designates a third order entity, the transmitted propositional content. It takes the form of a finite construction introduced by the complementizer *ni*. The Goal argument in (36) designates a fourth order argument, the reported speech act. It takes the form of a full clause. Note that in the first two cases the translation "tell about" is appropriate, whereas in the last two cases the translation "tell" is appropriate. In Fijian the same verb is used in all four constructions.

Thus Fijian *tu'una* "tell (about)" occurs in the following configurations, each with a different Goal argument, each realized in a different form:

- (37) $tu'una_V (x_1)_{Ag} (x_2)_{Go} (x_3)_{Rec}$ (cf. (33))
 $tu'una_V (x_1)_{Ag} (e_1)_{Go} (x_2)_{Rec}$ (cf. (34))
 $tu'una_V (x_1)_{Ag} (X_1)_{Go} (x_2)_{Rec}$ (cf. (35))
 $tu'una_V (x_1)_{Ag} (E_1)_{Go} (x_2)_{Rec}$ (cf. (36))

With respect to the differences in the behaviour of complements the layered approach allows for an explanation of many restrictions on the expressibility of satellites and operators within complements (cf. Bolkestein 1989, this vol.). For instance, a predicational complement cannot contain operators or satellites expressing propositional attitudes. The following sentence is ungrammatical if the adverb *certainly*, a proposition satellite, is interpreted as modifying the complement, a predication:

- (38) *I saw him certainly leave

This ungrammaticality follows from the absence of a propositional level in predicational complements, as is indicated in the representation in (32).

The classification of argument types can be further refined by taking into account the role of operators. A distinction can be made between a layer +

full set of operators corresponding to that layer on the one hand and a layer + a restricted set of operators on the other hand. A restriction on the set of operators that can be expressed within the complement of a certain predicate will in general take the form of the obligatory application of a single operator. An illustration of the latter point is:

- (39) I want him to leave *yesterday/today/tomorrow

- (40) It is possible that he left yesterday/leaves today/will leave tomorrow

Both the complement of *want* and the complement of *possible* are predications. They refer to 'wanted' and 'possible' events. 'Wanted events' are necessarily subsequent to the 'wanting event'. Arguments of the verb *want* therefore have only one possible temporal interpretation: they refer to events which may occur subsequently to the event referred to in their matrix clause. This *subsequence* is signalled by the infinitival form of the complement. 'Possible events', on the other hand, are not tied in any way to the 'being possible event'. Arguments of the adjective *possible* can refer to events which occurred anterior to, simultaneous with, or subsequent to the event referred to in their matrix clause.

The distinction between complements in which there is a free choice of operators and complements in which the choice of operators is restricted by the predicate leads to a large number of different complement types. Some examples are listed in (41):

(41) compl.	predicate-class	example
E_1	utterance (direct sp.)	$say_V (x_1)_{Ag} (E_1)_{Go}$
$\pi_3 X_1$	propositional attitude	$believe_V (x_1)_{Exp} (\pi_3 X_1)_{Go}$
$Cert X_1$	knowledge (semi-fact.)	$realize_V (x_1)_{Exp} (Cert X_1)_{Go}$
$\pi_2 e_1$	commentative	$possible_A (\pi_2 e_1)_\theta$
Subs e_1	desiderative	$want_V (x_1)_{Exp} (Subs e_1)_{Go}$

In this way many properties of particular groups of complement-taking predicates can be handled. For instance, the semi-factive character of knowledge predicates can be accounted for by means of a 'frozen' propositional operator 'Cert(ainty)' (cf. Hengeveld 1988).

4.2. Satellites

Satellites can not only be classified according to the layer they modify (3.2), but also according to their internal structure. Most of the types of subordinate construction recognized in 4.1 appear to be relevant in the case of satellites too (cf. Dik et al. this vol.). Consider the following series of examples:

(42) We did some exercises because we had to play a match

(43) Before going to the match I prepared dinner

(44) I have bought this car in Amsterdam

(45) John types expertly

The Reason satellite in (42) designates a third order entity (the propositional content 'we have to play a match'), the Time satellite in (43) designates a second order entity (the SoA 'my going to the match'), the Location satellite in (44) designates a first order entity (the individual 'Amsterdam'). Finally, some satellites, such as the Manner satellite *expertly* in (45), have the internal complexity of a mere predicate, designating a property or relation. These satellite types are of decreasing internal complexity, as is shown in (46):

(46) $(X_I: \text{proposition } (X_I))_{\text{Reason}}$
 $(e_I: \text{predication } (e_I))_{\text{Time}}$
 $(x_I: \text{pred}_N(x_I))_{\text{Location}}$
 $(\text{pred}_{\text{Adv}})_{\text{Manner}}$

As in the case of complements, this approach makes it possible to account for many formal differences between satellites and allows for an explanation of restrictions on the expressibility of satellites and operators within satellites. For instance, propositional attitudes may be expressed within propositional satellites, whereas this is impossible in predicational satellites:

(47) We did some exercises, because we probably had to play a match/because we might have to play a match

(48) *Before probably going to the match I prepared dinner

The classification of satellites, too, can be refined by distinguishing between satellites in which there is a free choice of operators and satellites in which the choice of operators is predetermined by the preposition or conjunction introducing the satellite, which in turn is triggered by its semantic function. Compare for instance the following sentences:

(49) I am wearing my boots in case it has rained/rains/will rain

(50) I am wearing my boots in order to keep/*have kept my feet dry

Both the satellite in (49) and that in (50) designate SoAs: in (49) the satellite designates the potential circumstance of the SoA described in the main clause, in (50) the satellite designates the SoA that the SoA described in the main clause should lead to. The latter is necessarily subsequent to the SoA described in the main clause, whereas the former is not.

Some examples of satellite types that can be accounted for following the approach illustrated here are given in (51):

(51) satell.	semantic function	example
$\pi_3 X_I$	Reason	because
$\text{Cert} X_I$	Concession (semi-fact.)	though
$\pi_2 e_I$	Potential circumstance	in case
$\text{Subs } e_I$	Purpose	in order to

Note that the semi-factive nature of some conjunctions, such as *though* in one of its uses (as opposed to *even if*), can be accounted for by means of the same procedure that was applied in the case of semi-factive complements.

5. Conclusion

In this paper I have tried to give a brief description of a hierarchically structured model for the representation of utterances, within which two levels and several layers are claimed to be relevant. Each layer consists of a variable restricted by a kernel structure (2.1). Each level is structured on the basis of a frame (2.2). Each layer may be modified by operators (3.1) and satellites (3.2). The layers contained within the model of the utterance constitute a typology of complement constructions (4.1) and adverbial constructions (4.2).

Notes

1. I would like to thank Simon Dik, Hotze Mulder, Jan Rijkhoff and the editors of this volume, in particular Machtelt Bolkestein, for their comments on an earlier version of this paper.
2. A notable exception to this tendency are proposals concerning the representation of illocution in FG (de Jong 1981, Moutaouakil 1986). These proposals, however, still considered the predication to be the highest unit of analysis, though adding an illocutionary operator to it.
3. For subordinate constructions see below.
4. Layers of even higher and lower complexity than the ones discussed here are proposed by van den Hauwe (1988) and Rijkhoff (this vol.) respectively.
5. The n in this formula indicates that a predication may contain more than one term.
6. Note, however, that those adverbials modifying the speech act which can themselves be considered propositions can be evaluated in terms of their truth, irrespective of the truth of the main clause, as in:
 - (a) A: Watch out, because there is a bull in the field!
B: That's not true!

Here it is the reason adverbial which is claimed not to be true, not the main clause, which, being an imperative sentence, cannot be assigned a truth value at all. For the treatment of adverbials, see below.
7. For a different view on the representation of illocution in FG see de Jong (1981), Moutaouakil (1986), Dik (1989, this vol.), Vet (this vol.). For a general discussion of the problems involved see Risselada (1988).
8. The performative predicate shows up in adverbial expressions like *metaphorically speaking*, *to tell you the truth*, etc.
9. This is a partial departure, inspired by Risselada (1988), and Vet (this vol.) from Hengeveld (1988).
10. The situation is further complicated by the fact that speech act verbs in the first person present tense may be used in a reportative, i.e. self-descriptive sense, and by the fact that some verbs of saying may refer to *pronouncing* rather than to *executing* an illocutionary act (Lyons 1977: 740).

11. See Dik (1989) for a different view on the representation of satellites.
12. The representation of satellites given here cannot be fully motivated. It is in fact only valid for restrictive satellites. I refrain from giving the representation needed for handling non-restrictive satellites. See Hannay and Vester (1987), Hengeveld (1989), Bolkestein (1989) and Dik et al. (this vol.) for discussion.
13. In Dik et al. (this vol.) illocution satellites (σ_4) and clause satellites (σ_5) are subsumed under the heading *illocution satellites*.
14. The labels for the different classes of complement-taking predicates used here are taken from Noonan (1985).

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