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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 the Clause and the Typology of Adverbial Satellites

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0. Introduction[1]

Natural language sentences not only allow one to refer to States of Affairs (SoA) in the world or in some possible world, they also provide subsidiary information of a rather heterogeneous nature: information on additional properties of the SoAs themselves, on the speaker's attitude towards the content of the speech act, on the type of speech act the speaker wants to realize, etc. In Functional Grammar (FG) a sentence is represented as a layered structure. The highest layer is that of the clause, representing the speech act; the next one that of the proposition, representing the content of the speech act; the layer below this is that of the predication. The predication constitutes the representational part of the sentence: it refers to some SoA in the world or in some possible world.

The representation of the clause as a hierarchically structured unit consisting of several layers of increasing complexity offers the possibility to reanalyse the position of satellites in FG. This paper deals with the way in which satellites can provide information with respect to these different layers. It is argued that satellites can be subdivided into distinct types which contribute to the specification of a particular layer, and that when this is done a number of differences in the behaviour of these groups of satellites can be accounted for in a straightforward way. 1. gives a brief description of the status of satellites within a layered structure of the clause. 2. is devoted to the typology of satellites in terms of the different layers at which they apply. Some formal and behavioural correlates of the typology arrived at are given in 3. 4. demonstrates the relevance of some other parameters in the typology of satellites: the internal complexity of satel-

lites and the restrictive/non-restrictive opposition.

1. The status of satellites

In FG adverbial constituents are generally referred to as *satellites*. Satellites differ from arguments in the fact that they are optional. Here they will be considered as optional additions to a specific layer in the hierarchical structure of the clause.

In order to appreciate the status of satellites first consider the following alternative expression types:

(1) **It is rumoured that** John is ill

(2) John **would** be ill

(3) **Allegedly** John is ill

A speaker who wishes to make clear to an addressee that he has obtained the propositional content which he is transmitting from a third party may use different strategies: he may turn this propositional content into the argument of a higher predicate which indicates the non-firsthand status of the content presented, as in (1); he may indicate this status of the proposition through the use of a special verbal mood, as in (2); or he may add this information to the proposition through the addition of a satellite, as in (3). The first and the last method represent *lexical* strategies for conveying the required extra information, the second a *grammatical* strategy. All three strategies can be seen as means to give expression to a single semantic category, known as 'quotative', 'reportative' or 'hearsay', although in general the lexical strategies present more specific information than the grammatical strategy, which necessarily has more general applicability.

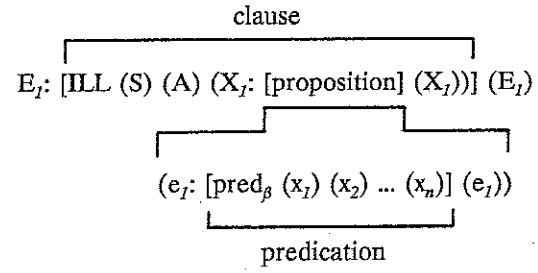
We consider satellites to be optional lexical means conveying additional information on one of the layers in the hierarchical clause model. *Optional* since they can be left out without affecting the grammaticality of the sentence. *Lexical* in opposition to *grammatical* categories such as tense, mood, and aspect. *Conveying additional information*, since the main information pertaining to a particular layer is carried by the kernel structure to which the satellite is added.

2. Satellite typology

2.1. General outline

Just as a satellite may provide additional information relevant to the propositional layer, as in (3), it may provide additional information relevant to any of the other layers distinguished within the model of the clause, which is given here for the sake of convenience:[2]

(4)



A (nuclear) predication refers to a set of possible SoAs (or to an event type). For example, the predication 'hit (John) (Bill)' can potentially be used to refer to any situation in which John is in a hitting relation with respect to Bill. Within the predication itself we can distinguish three layers:[3]
(i) the nuclear predication, which defines the event type referred to (cf. Barwise and Perry 1983);
(ii) the core predication, which defines a subcategory of the event type defined by the nuclear predication;
(iii) the extended predication, which contains a position for the tense operator and, optionally, expressions which specify the (temporal, spatial and/or cognitive) setting of the SoA.[4]
The variable e_1 symbolizes the SoA described in the nuclear predication; the variable X_1 represents the propositional content of the utterance. The responsibility for the truth of a proposition is assumed by the speaker (S) vis-à-vis the addressee (A) by means of an illocutionary act (E_1).

The lower level in (4) can thus be seen as constituting the *representational level* of the utterance: this level deals with the description of a SoA obtaining in some real or imaginary world to which the speaker wants to refer. The upper level in (4) can be seen as representing the *interpersonal level*: this level deals with the way in which the speaker presents the information concerning the situation referred to to the addressee.

This layered structure of the clause offers several units to which satellites can be attached. In the following table these units are listed together with their corresponding satellite type. The names given to these satellites refer to the 'hosting' part of the utterance; for ease of reference abbreviations (σ_1, σ_2, etc.) are provided. The four types of satellite correspond to four types of operators (π_1, π_2, π_3, π_4), which capture the corresponding grammatical distinctions relevant to the different levels.

(5) **Satellites (terminology)**

hosting layer	satellite type	
predicate	predicate satellites	(σ_1)
predication	predication satellites	(σ_2)
proposition	proposition satellites	(σ_3)
illocution	illocutionary satellites	(σ_4)

Given the functions of the different layers, these four types of satellite may be defined as in (6), taken from Hengeveld (1989):[5]

(6) **A definition of satellites**

(i) **Predicate satellites** capture the lexical means which specify additional properties of the set of SoAs designated by a nuclear predication.

(ii) **Predication satellites** capture the lexical 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.

(iii) **Proposition satellites** capture the lexical means through which the speaker specifies his attitude towards the proposition he puts forward for consideration.

(iv) **Illocutionary satellites** capture the lexical means through which the speaker modifies the force of the basic illocution of a linguistic expression so as to make it fit his communicative strategy.

As a first illustration, consider the following series of examples:

(7) Mary danced **beautifully** (σ_1)

(8) Mary danced beautifully **yesterday** (σ_2)

(9) Mary **probably** (σ_3) danced beautifully yesterday

(10) **Frankly,** (σ_4) Mary probably danced beautifully yesterday

In (7) the adverb *beautifully* specifies an additional property of Mary's dancing. The addition of the adverb gives us a more specific picture of the type of dancing in which Mary is involved. In (8) the adverb *yesterday* does not give a more specific picture of Mary's dancing, but rather gives additional information about the *occurrence* or setting of the dancing event. In (9) the adverb *probably* indicates the speaker's attitude towards the information he is presenting. In (10) the adverb *frankly* comments on the performance of the speech act.

Thus these four different satellites give optional further information pertaining to additional features of the SoA (σ_1), the location of the SoA (σ_2), the speaker's attitude towards or evaluation of the propositional content (σ_3), and the character of the speech act (σ_4).

The classification proposed here is similar to the classification of adverbial constructions proposed in Quirk et al. (1985), elaborating on Greenbaum (1969):

(11) **The classification of adverbial constructions**

Quirk et al. (1985)	corresponding satellite type
adjuncts: - predication - sentence	representational level: - predicate satellites - predication satellites
disjuncts: - attitudinal - style	interpersonal level: - proposition satellites - illocutionary satellites

Many of the relevant differences in the behaviour of the different satellite types were already noted by Greenbaum (1969), Bartsch (1972), Platt and Platt (1972), Quirk et al. (1972), Allerton and Cruttenden (1974), and Quirk et al.

(1985). We hope to demonstrate in 3. that these differences can be accounted for within the model used here. But first we will try to arrive at a more detailed classification of the several satellite types.[6]

2.2. *Predicate satellites*

Predicate satellites (σ_1) represent the lexical means through which additional features of the SoA as defined in the nuclear predication can be specified. The general criterion for σ_1 status is whether the SoA as specified by the nuclear predication is somehow different with the satellite than it is without. The following subtypes can be distinguished.

(i) Additional participants:

- *Beneficiary* (Ben) is the person or institution for whose benefit (sometimes: against whose interest) the SoA is effected:

(12) a. John bought some flowers **for Mary**
b. The police set a trap **for John** (= against John)

- *Company* (Com) specifies an entity together with whom the SoA is effected:

(13) a. John went to Paris **with Mary**
b. The roof came down **with the walls**

- *Instrument* (Instr) specifies the tool with which some Action is carried out or a Position maintained. It thus requires a [+control] SoA in the nuclear predication.

(14) John cut the meat **with a knife**

- *Inner Cause* (IC) specifies the entity presented as causing a process.

(15) He died **of pneumonia**

(ii) Means and manner:

- *Manner* satellites indicate the way in which an Action is carried out, a Position is maintained, or in which a Process goes about:

(16) a. John drove the car **recklessly**

b. John **quietly** stayed in his hotel
c. The tree fell down **silently**

A further refinement of Manner satellites is required into Controller-oriented, Goal-oriented, and SoA-oriented ones:

(17) a. John answered **eagerly**
(John was eager in answering: Controller-oriented)
b. John writes **illegibly**
(what he writes is illegible: Goal-oriented)
c. Annette dances **beautifully**
(her dancing is beautiful: SoA-oriented)

- *Speed* satellites indicate the amount of Action/Process run through per unit of time; they require [+dyn] SoAs:

(18) John answered the question **quickly**
(did the answering in a short time)

- *Quality* satellites designate the role/function/authority by virtue of which an Action is carried out, or a Position maintained; they require [+con] SoAs:

(19) a. John accompanied Mary **as her lawyer**
b. John stayed in the country **as an exile**

This characterization of Quality is not intended to account for all predicative adjuncts. In most cases the predicative adjunct describes a circumstance in which rather than a function by virtue of which the action of the nuclear SoA is carried out.

(iii) Spatial orientation:

Source, *Path*, and *Direction* designate the point of origin, the orientation, and the terminal point of a movement:

(20) John drove **from Amsterdam** (Source) **to Rotterdam** (Direction) **along the highway** (Path)

The following table summarizes what was said here about *predicate satellites*:

(21) **The classification of predicate satellites**

semantic domain	satellite function
additional participants	Beneficiary, Company, Instrument, Inner Cause
manner and means	Manner, Speed, Quality
spatial orientation	Source, Path, Direction

2.3. Predication satellites

Predication satellites (σ_2) represent the lexical means through which the SoA designated by the nuclear predication can be located with respect to spatial, temporal, and cognitive dimensions. They specify the setting within which an SoA occurs. The following subtypes can be distinguished.
(i) Spatial setting:
A *Location* (Loc) satellite designates the place where a certain SoA took place:

(22) John met Peter **on the platform**

Spatial setting should be distinguished from *spatial orientation* (see Quirk et al. 1985 for these examples):

(23) She kissed her mother **on the cheek** (σ_1)

(24) She kissed her mother **on the platform** (σ_2)

In (23) the satellite specifies the spatial orientation of the action, and can therefore be considered a predicate satellite. In (24) the satellite specifies the spatial setting of the SoA, and can therefore be considered a predication satellite. For some behavioural differences between the two satellite types see 3. Note here that (24), but not (23), can receive a paraphrase stressing its event-locating character:

(25) *Her kissing her mother took place on the cheek

(26) Her kissing her mother took place on the platform

Note also that both satellites can appear in the same sentence:[7]

(27) She kissed her mother **on the cheek on the platform**

(ii) Temporal setting:
- A *Time* (Time) satellite specifies the time at which (from which, until which) a certain SoA took place:

(28) a. John met Peter **at five o'clock**
b. John walked in the park **from after lunch until three o'clock**

- A *Duration* (Dur) satellite specifies the time during which a certain SoA took place:

(29) John walked in the park **for three hours**

- A *Frequency* (Freq) satellite specifies the number of times a certain SoA took place:

(30) John met Peter **repeatedly**

(iii) Setting relative to other SoAs:
- A *Circumstance* (Circ) satellite specifies an SoA which occurs simultaneously with the SoA referred to in the main predication:

(31) Mary was smoking a cigarette, **while John was washing the car**

(32) **No more matters arising**, the meeting was closed

- A *Cause* (Cause) satellite specifies an SoA the occurrence of which instigates the occurrence of the SoA referred to in the main predication:

(33) The tree fell down because of the heavy rainfall

A Cause (σ_2) satellite should be distinguished from an Inner Cause (σ_1)

satellite:

(34) He died **of hunger** (Inner Cause)

(35) He died **because he had no money to buy food** (Cause)

In (34) the satellite specifies the force instigating the process of dying, in (35) the satellite specifies the event causing the event described in the main clause. Only (35) can receive a paraphrase stressing its event-locating character:

(36) *His dying took place of hunger

(37) His dying took place because he had no money to buy food

Both satellite types can cooccur in one sentence:

(38) He died of hunger because he had no money to buy food

The difference between the two satellite types is furthermore reflected in the different expressions for their semantic functions, *of* vs. *because (of)*.
- A *Condition* (Cond) satellite specifies an SoA on the occurrence of which the occurrence of another SoA depends:

(39) He'll take his umbrella in case of rain
(His taking his umbrella will take place in case of rain)

(iv) Cognitive setting:
- *Purpose* satellites provide a motivation for the occurrence of a (necessarily [+control]) SoA^1 by specifying a future SoA^2 that the controller wishes to achieve through SoA^1. For example:

(40) John ran to the station **in order to catch the train**

Note that the purpose is necessarily ascribed to the controller: it was John who wanted to catch the train, and therefore he ran to the station.
- *Reason* satellites provide a motivation for why an SoA (again, necessarily [+control]) took place in terms of a causal ground ascribed to the controller.[8] Such a Reason may consist in a close paraphrase of a Purpose:

(41) John ran to the station **because he wanted to catch the train**

The difference with (40) is, that the Reason satellite in (41) describes John's wish to achieve the future SoA rather than that future SoA as such. The Reason may also consist in some preceding SoA:

(42) John ran to the station **because he had been late the day before**

The following table summarizes what was said here about *predication satellites*:

(43) **The classification of predication satellites**

semantic domain	satellite function
spatial setting	Location
temporal setting	Time, Frequency, Duration
setting relative to other SoAs	Cause, Circumstance, Condition
cognitive setting	Reason, Purpose

2.4. Proposition satellites

Proposition satellites (σ_3) deal with those lexical means through which the speaker evaluates (part of) the propositional content he presents in a speech act.
- An *Attitudinal* (Att) satellite specifies the speaker's attitude towards (part of) the propositional content, and corresponds to Greenbaum's *attitudinal disjunct* (see also Bartsch 1972; Bellert 1977). Depending on the part of the proposition they bear on, this group of satellites can be further classified into (a) content-oriented, (b) event-oriented, and (c) participant-oriented Attitudinal satellites:
(a) Content (X) oriented attitudes. Within this category we find satellites expressing both subjective and evidential modalities (or propositional attitudes), such as:

(44) a. **In my opinion,** we should do it (subjective epistemic)
b. **Hopefully,** you will succeed (subjective volitional)

c. **In my experience**, such questions are seldom solved (experiential)
d. **Apparently**, John has failed (inferential)
e. **Allegedly**, John was guilty of perjury (quotative)

(b) Event (e) oriented attitudes. The attitudinal disjunct can also have bearing on the event to which reference is made within the propositional content, as in:

(45) **Fortunately**, we found him immediately

Through the adverb it is not expressed that the propositional content is fortunate, but rather that it is fortunate that the finding-event took place.
(c) Participant (x) oriented attitudes. A third subsection of the clause that the attitudinal disjunct can have a bearing on is one of the participants in the event to which reference is made within the propositional content processed in the speech act, as in:

(46) **Wisely**, John didn't answer the question

This sentence can be paraphrased as *It was wise of John not to answer the question.*
Note that in English the same adverb *wisely* can be used as a Manner satellite (σ_1) and as an Attitudinal satellite (σ_3). The differences between these can be read off from the placement of the adverb and the intonation pattern with which the construction is provided:

(47) a. **Wisely**, John answered the question
b. John, **wisely**, answered the question
c. John answered the question, **wisely**

(48) a. ??**Wisely** John answered the question
b. ?John **wisely** answered the question
c. John answered the question **wisely**

Although these differences are not absolute, the Manner satellite clearly prefers a non-initial position, whereas the Attitudinal satellite has a preference for initial position. Furthermore, the Manner satellite is intonationally integrated into the predication, whereas the Attitudinal satellite is usually marked off from the rest by prosodic inflections which suggest that it is less integrated with the rest. This corresponds, in iconic fashion, to the different roles these satellites play in the fabric of the clause. In German and Dutch we find formal differences between the adverbs, corresponding to their roles as σ_1 or σ_3 satellites:[9]

(49) a. ***Klugerweise*** *beantwortete Hans die Frage*
wisely answered John the question
"Wisely, John answered the question" (=(47))
b. *Hans beantwortete die Frage* ***klug***
John answered the question wisely
"John answered the question wisely" (=(48))

(50) a. ***Wijselijk*** *beantwoordde Jan de vraag*
wisely answered John the question
"Wisely, John answered the question" (=(47))
b. *Jan beantwoordde de vraag* ***wijs***
John answered the question wisely
"John answered the question wisely" (=(48))

- A *Source* (So) satellite specifies a third party presented as being responsible for the information contained in the propositional content:

(51) **According to John** there's a bull in the field

- An *Evidence* (Evid) satellite specifies an SoA the occurrence of which provides the evidence on which the propositional content is based:

(52) **Given his absence of the last few days**, he has probably gone to Rome after all

- A *Motivation* (Mot) satellite specifies a fact which supports the fact designated by the propositional content of the speech act:[10]

(53) John's at Sue's house, **because his car's outside**

The following table summarizes what was said here about *proposition satellites*:

(54) **The classification of proposition satellites**

semantic domain	satellite function
propositional attitude validity of proposition	Attitude Source Evidence Motivation Condition

2.5. Illocutionary satellites

Illocutionary satellites (σ_4) represent the lexical means through which the illocutionary value of the clause can be specified or modified. The semantic functions of many of these satellites are the same as those of satellites at lower levels. The difference is, that illocutionary satellites are interpreted as modifying the speech act rather than the SoA to which reference is made within that speech act.

- *Manner* (Man) satellites at the level of the speech act indicate the way in which the speech act is carried out. They can be subdivided into three groups:

(a) Speaker-oriented:

(55) **Frankly,** I've had it

(b) Addressee-oriented:

(56) **Honestly,** did you tell him?

(c) Speech act-oriented:

(57) **Briefly,** it's no use

- A *Beneficiary* satellite at the illocutionary level specifies the person in whose interest the speech act is executed:

(58) **For your own sake,** stay away from him!

- A *Reason* satellite at this level provides a motivation for why the speech act is carried out:

(59) **Since you are interested,** John is a catholic

- A *Condition* satellite of level 4 specifies a condition on the felicity of the speech act (see Dik 1989; Harder 1989):

(60) John has left, **in case you haven't heard**

- A *Time* satellite specifies the position of the speech act in a series:

(61) **For the last time,** give it to me!

The following table summarizes these various distinctions in the domain of *illocutionary satellites*:

(62) **The classification of illocutionary satellites**

semantic domain	satellite function
additional participants manner of speech act communicative setting	Beneficiary (of speech act) Manner (of speech act) Time, Reason, Condition (of speech act)

3. Some formal and behavioural correlates

So far, the validity of the proposed classification has mainly been demonstrated by semantic arguments. In this section we intend to show that there are several formal and behavioural differences between the different satellite types proposed in 2. We start with giving the evidence for the distinction between satellites at the representational (σ_1, σ_2) and those at the interpersonal (σ_3, σ_4) level, and then proceed to discussing the differences between the satellites at each of these levels.

3.1. Representational (σ_1, σ_2) vs. interpersonal satellites (σ_3, σ_4)

There are a number of arguments that can be used to demonstrate that representational satellites belong to the extended predication: (i) they fall under the scope of pragmatic function assignment; (ii) they constitute one information unit with the core predication, (iii) they are under the scope of π_1 and π_2 operators, and (iv) they are typically conditioned by other properties pertaining to the representational level.

3.1.1. Pragmatic function assignment. The tests given by Quirk et al. (1985) to distinguish between adjuncts and disjuncts can be used to distinguish representational satellites from interpersonal satellites. Some of the relevant tests can be interpreted as giving an indication about Topic and Focus assignment. There is evidence that Topic and Focus assignment have the extended predication, i.e. the core predication with level 2 operators and satellites specified, as their domain. Assigning Focus to satellites of the interpersonal level is hardly possible, except in highly marked contexts:

(63) ???John **probably** lost his wallet

(64) ???**Briefly**, John lost his wallet

If this is correct, Focus on satellites may be taken as evidence that they form part of the extended predication and are therefore representational satellites. Two tests which give a clear indication of the Focus status of a constituent are: occurrrence as an answer to a WH-question, as in (65), and occurrence in contrastive contexts such as constructions with alternative negation and interrogation, a Latin example of which is given in (66):

(65) A: Why are you staying in tonight?
B: Because my mother is ill.

(66) *Id se sui* ***muniendi*** ***non*** ***Galliae***
it he himself.GEN.SG protecting.GEN.SG.M not Gaul.GEN.SG
impugnandae ***causa*** *facere*
attacking.GEN.SG.F for.the.sake.of do
"That he did it to protect himself, not to attack Gaul" (Caes.*Gal.*1,44,6)

The Purpose satellites *sui muniendi, non Galliae impugnandae causa* have

Contrastive Focus in (66).

A further test showing that representational satellites are part of the domain within which pragmatic functions are assigned is provided by Quirk et al. (1985), who show that all these satellites can be clefted.

3.1.2. Information unit. Representational satellites form one information unit together with the core predication.
(i) They fall under one unified intonation pattern.
(ii) They can be within the scope of a proform (Quirk et al. 1985; Rutherford 1970):

(67) a. He'll take his umbrella in case it rains and so does Ann
b. *He'll take his umbrella, in case you are wondering and so does Ann

In (67a) *so* in *so does Ann* refers to the extended predication, the σ_2 predication satellite Condition included. In (67b) it refers to the predication, not including the σ_4 illocutionary satellite Condition.
(iii) The whole unit, including the representational satellite, can be questioned with a yes/no question (Rutherford 1970; Bellert 1977):

(68) Is John speaking loudly? Yes/no.

(69) Does he take his umbrella in case it rains? Yes/no.

(70) *Does he take his umbrella, in case you are wondering? Yes/no.

(71) *Does India probably face famine?

Again the answer in (70) does not include the illocutionary satellite.

3.1.3. Scope of operators. Another indication of the level of a satellite is the scope of the operators. That is, σ_1 satellites fall under the scope of π_1 operators, and σ_2 and σ_1 satellites both fall under the scope of π_2 operators, that is the operators for negation, tense, and objective modality. Negation will be discussed separately in 3.4, here we give an example of scope phenomena concerning the tense operator.

A rule which illustrates the relevance of tense operator scope is the Latin *consecutio temporum*, which states that the tense in an argument or satellite

clause is governed by the tense in the matrix sentence. This can be reinterpreted as a rule which states that finite clauses which fall under the scope of the tense operator have a tense form which is determined by that tense operator. The consequence of this reformulation is that only finite clauses which function as σ_1 and σ_2 satellites can be sensitive to the consecutio temporum rule. And indeed, the clauses which are presented as exceptions to the rule in Latin grammars, such as some consecutive and causal clauses, are interpersonal rather than representational satellites.

As an illustration may serve clauses introduced by *quoniam*. Bolkestein (fc.) shows that in Latin the kind of subordinator chosen for a causal clause gives an indication about the status of this clause: *quoniam*-clauses are σ_3 or σ_4 satellites, *quod-* and *quia*-clauses are σ_2 satellites.[11] Cf. also Greek *epei*-clauses (Rijksbaron 1976) and English *since* and *as* clauses (Quirk et al. 1985) which show a behaviour similar to *quoniam* clauses. The interpersonal level status of *quoniam*-clauses is indeed confirmed by Bolkestein's observation that especially in *quoniam*-clauses consecutio temporum is relatively often not observed.

3.1.4. Conditions on satellites. The occurrence of satellites may be conditioned by a variety of features of the clause structure. For representational satellites, these features typically pertain to the representational level. For example:

(72)	satellite		condition
σ_1	Instrument		[+control]
	Beneficiary		[+control]
	Manner		[+control] or [+dynamic]
	Speed		[+dynamic]
σ_2	Reason		[+control]
	Purpose		[+control]
	Duration		[-telic]
	Interval		[+telic]
	Time:	yesterday	past
		tomorrow	future

On the other hand, satellites at the interpersonal level tend to be constrained by features pertaining to the interpersonal level. For example, as shown in example (71), a satellite such as *probably* cannot occur in the scope of interrogative illocution. At the same time, the constraints on these higher-level satellites seem to be much less specific than those on lower-level ones. We return to this point in 3.2.1.3 below.

3.2. Predicate (σ_1) vs. predication (σ_2) satellites

In the preceding section the two types of representational satellite, predicate and predication satellites, were taken together in order to compare their behaviour with that of satellites at the interpersonal level, propositional and illocutionary satellites. In this section we show that there are also several behavioural differences between predicate and predication satellites. These differences concern: (i) argument-like behaviour of predicate satellites (discussed in 3.2.1); (ii) ordering and position differences (3.2.2); (iii) paraphrase possibilities (3.2.3); (iv) behaviour under negation (separately discussed in 3.4).

3.2.1. Argument-like behaviour of predicate satellites. Given the intimate connection of predicate satellites with the predicate, we may expect predicate satellites to behave in a way similar to arguments in a number of respects. Evidence for such argument-like behaviour can be found in (i) Subject and Object assignment possibilities, (ii) the role of satellites in predicate formation, and (iii) semantic constraints on the occurrence of satellites.

3.2.1.1. Subject/Object assignment to predicate satellites. The FG approach to Subject and Object assignment holds that these functions can be assigned to terms (arguments or satellites) of the predication, and designate those entities which are taken as a primary or secondary point of departure for the presentation of the SoA designated by the predication.[12] It has further been assumed that both within and across languages the possibilities for Subj/Obj assignment decrease along the following Semantic Function Hierarchy (SFH):

(73) FirstArg > Go > Rec > Ben > Instr > Loc > Temp

Ben and Instr are clear examples of σ_1, with their own contribution to the definition of the SoA (see 2.2). They can therefore also act as points of departure for perspectivizing the SoA. But Loc and Temp at first sight present a problem for this theory: if these are examples of σ_2, they do not enter into the definition of the SoA as such, but rather serve to locate the SoA with respect to spatial and temporal dimensions. How could they then serve as point of

departure for perspectivizing the SoA? Closer scrutiny of the relevant data has revealed, however, that it is especially the 'inner' semantic functions which can be assigned Subject function: those semantic functions, that is, which do indeed contribute to the definition of the SoA as such. These 'inner' semantic functions can therefore be interpreted as σ_1 rather than σ_2 satellites, and on that interpretation they do not provide counter-examples to the Subj/Obj assignment theory. Rather, this theory provides an additional criterion for distinguishing σ_1 and σ_2 satellites. Consider the following data.

The evidence for Subj assignment to Temp is very slight indeed. It is reported for two Philippine languages, Kalagan (Keenan 1972) and Cebuano (Bell 1983). Keenan gives no examples. Bell (ibid.: 146) gives the following example from Cebuano:[13]

(74) *Mogikan ang barko sa alas sayis*
ACT.leave SUBJ ship at clock six
"The ship will leave at six o'clock"

(75) *Igikan sa barko ang alas sayis*
INS.leave by ship SUBJ clock six
"Six o'clock will be left by the ship"

Bell adds, however, that constructions of type (75) are quite rare, except in relative constructions. In Cebuano (as in Kalagan) only Subjects can be relativized. Thus, the only way of expressing something like 'the time **at which the ship will leave**' is through embedding a construction of type (75). It may perhaps be assumed that it is this constraint on relativization which has occasioned Subj assignment to exceptionally go beyond its natural limits.

The evidence for Subj/Obj assignment to Loc is much more extensive. Thus, Subj assignment to Loc is reported for Maguindanao, Tagalog, Kapampangan, Kalagan, and Cebuano (all Philippine languages); for Malagasy (which also belongs to the Malayo-Polynesian languages); and Subj and Obj assignment to Loc is reported for Luganda, Chimwi:ni, Swahili, and Kinyarwanda (all Bantu languages). Note, however, that Loc does not necessarily have the status of a σ_2 satellite, which simply locates the whole SoA in some spatial domain. Locative terms can also have argument status and, depending on the way the notion 'locative' is used, they might also cover one or more of the 'inner' local or directional satellites which were assigned σ_1 status above. Could it be, then, that it is especially these 'inner' locatives which can be assigned Subj function? That there may be something to this idea can be seen even in English. Compare

the following pair:

(76) a. John was writing on the terrace
= (a) "John inscribed something on the terrace"
= (b) "John was writing something while being on the terrace"
b. The terrace was written on by John
= only (a)

In the (a) interpretation of (76a), *the terrace* can be considered as an argument of the predicate *write on*, or at least as a σ_1 satellite closely associated with the predicate; in the (b) interpretation it is a σ_2 satellite. Only in the former case can Subj be assigned to it, witness the unambiguous character of (76b). Something similar is involved in the following pair (Quirk et al. 1972: 804):

(77) a. This problem was very carefully gone into by the engineers
b. *The tunnel was very carefully gone into by the engineers

Again, it appears that Subj assignment is possible only when the term in question is close to being an argument of the nuclear predicate.

There are similar indications in this direction for the languages mentioned above. Thus, in her description of Kapampangan Mirikitani (1972) makes a distinction between 'terminus locative', defined as 'the case designating the place towards or from which an activity is directed' (= Source + Direction), and 'general locative', comparable to our σ_2 Locative satellite. It is the terminus locative, not the general locative, which may receive Subj function. For example, in the Kapampangan equivalents of:

(78) a. I will go **to school** (terminus locative)
b. I will read **in school** (general locative)

it is only the terminus locative in (78a) which can be assigned Subj. Examples of predicates which take a terminus locative are 'write on something', 'cook in something', and 'go, walk to some place'.

Though we have not been able to check this for all the Philippine languages mentioned above, it is probable that the situation in these languages is similar. For example, Bell (1983: 209) notes that Loc in Cebuano includes Source and Direction, and the only example she gives of a Loc to which Subj is assigned is again 'cook something in a pot', where the Loc term is obviously closely associated with the predicate. As for the Bantu languages, many of the examples

in which Subj or Obj is assigned to Loc again concern 'inner' Locatives which either have the status of arguments of the predicate, or of σ_1 satellites. Gary and Keenan (1977: 114) provide a direct parallel to (76) in Kinyarwanda. Compare:

(79) a. *Yohani y-a-andits-e ku meza n-ikaramu*
John he-PAST-write-ASP on table with-pen
"John wrote on the table with the pen"

b. *Yohani y-a-andits-e-ho ameza n-ikaramu*
John he-PAST-write-ASP-on table with-pen
"John wrote-on the table with the pen"

(79a) has the same ambiguity as (76a); but (79b) can only be interpreted as saying that John inscribed something on the table with the pen. Many of the examples from Kinyarwanda given in Gary and Keenan (1977), Dryer (1983), and Perlmutter and Postal (1983) likewise concern 'inner' Locatives, as in 'throw something into the water', 'send someone to school', 'sit on a chair'. The same is true for the examples given from Chimwi:ni in Kisseberth and Abasheikh (1977): 'spill water on something', 'bring, send, write something to somebody'.

On the basis of this evidence, though admittedly incomplete, it seems that there is a good basis for the following hypotheses:

(H1) In languages in which Subj/Obj can be assigned to Loc and Temp, this is in principle restricted to Loc and Temp arguments and σ_1 satellites.

(H2) In the exceptional cases in which σ_2 satellites can receive Subj/Obj function, this is under the external pressure of some rule (such as relativization) which is constrained to Subj and/or Obj terms.

To the extent that these hypotheses are correct they can be used as an additional criterion for distinguishing σ_2 satellites from σ_1 satellites and arguments with similar semantic functions.

These hypotheses seem to offer a possible explanation for some 'difficult' passives in other languages as well. In Ancient Greek, for example, there are some cases which are traditionally described as passives, but whose Subjects are not evidently Goals (cf. also Metz 1988). An example of a passive Subject with the semantic function of Duration is the following:

(80) *Ede treis menes*
already three.NOM.PL months.NOM.PL
epitetrierarchento moi
be.triërarch.beyond.the.legal.time.MP.3PL me.DAT
"I have been a triërarch already three months beyond the legal time"
(Demosth. 50,23)

An active counterpart (with the same meaning) is found in Demosthenes 50,36:

(81) *Epitetrierarcheka tettaras*
be.triërarch.beyond.the.legal.time.ACT.1SG four.ACC.PL
menas
months.ACC.PL
"He had been a triërarch four months beyond his legal time"

The passive construction in (80) suggests that the Duration term *treis menes* is closely associated with the predicate, and has the status of either an argument or a σ_1 satellite. This close association could in this case have been reinforced by the fact that the Duration term has the accusative case form, which is also the normal case form for Goal arguments.

3.2.1.2. Predicate formation. There are strong indications that predicate formation rules may not only affect the arguments of the input predicate, but also the σ_1 satellites associated with the nuclear predication. On the other hand, σ_2 and higher satellites seem to fall outside the scope of predicate formation rules. Consider the following three phenomena:

(i) Incorporation:

Incorporation can be described as a form of predicate formation through which nominal predicates are incorporated into (derived) verbal predicates. Compare:

(82) a. John goes **to school**
b. John **school**-goes

The formation of the derived predicate in (82b) can be described as a process through which a nominal predicate corresponding to a Direction satellite is incorporated into the predicate. Across languages, certain satellites can be more easily incorporated than others. We expect that those satellites can be most easily incorporated, which have the closest relation to the nuclear predication. As a working hypothesis we may assume that only σ_1 satellites can be

incorporated.

Across languages we find the following types of incorporation:[14]

(83) **Incorporated nominal corresponds to argument**

a.	Goal	John bird-catches (= catches birds)
b.	Agent	man-drawn car (= drawn by men)
c.	Force	fuel powered engine (powered by fuel)
d.	Processed	it is snow-falling (snow is falling)

(84) **Incorporated nominal corresponds to satellite**

a.	Instrument	John knife-cut the meat (= with a knife)
b.	Direction	John school-went (= to school)
c.	Manner	You must quiet-sit (= quietly)
d.	Speed	John fast-ran to the station
e.	Location	John chair-sits in the garden

Most of the examples of (84) clearly involve σ_1 satellites. Only the incorporation of nominals with Location function might be reason for some doubt. Note, however, that in a construction such as:

(85) John sits on a chair in the garden

it is the 'inner' Location represented by *chair* which can be incorporated rather than the 'outer' Location represented by *garden*. Thus, we do not expect constructions of the form:

(86) *John garden-sits on a chair.

This is fully parallel to what we found in the case of Subj/Obj assignment: Locations can only be incorporated when they entertain a close bond with the predicate, such that the resulting compound predicate designates a specialized SoA rather than an unmodified SoA located at some place.

This can also be seen in a number of verbs in Dutch which feature an incorporated locative nominal:

(87) a. *paalzitten* = pole sitting, a record breaking game
b. *waterskiën* = water skiing, a special kind of skiing, not simply 'skiing on water'
c. *ijszeilen* = ice sailing, a special kind of sailing
d. *wadlopen* = (mud) flat walking, a special kind of walking
e. *schoolblijven* = school staying, not simply 'staying in school', but 'staying after school' (for punishment)

(ii) Valency reduction:

σ_1 satellites can also be involved in predicate formation when a valency reduction rule removes a σ_1 satellite instead of an argument. In Risselada (1987) it is argued that the middle-passive in Ancient Greek, which has a number of different uses (e.g. direct reflexive, indirect reflexive, pseudo-reflexive, pseudo-passive and passive) can be accounted for systematically by a set of valency reduction rules. In most cases, of course, the term which is removed by a valency reduction rule is an argument, but in the case of the Indirect Reflexive Predicate Formation Rule the Beneficiary is removed and implied in the predicate frame of the new predicate:

(88) **Indirect reflexive predicate formation rule**

input: $pred_{VAct}\ (x_1)_{Ag}\ (x_2)_{Go}\ (y_3)_{Ben}$
output: $pred_{VMp}\ (x_1)_{Ag}\ (x_2)_{Go}$
meaning: 'x_1 performs $pred_V$ in his own interest'

Mp (middle-passive) is the formal marker of the reduced nature of these derived predicates. An example is:

(89) *Ho stratos paraskeuazetai tas naus*
the army.SUBJ prepares.MP the ships.GO
"The army is preparing the ships for itself"

Risselada (1987: 131-132) suggests that the French example

(90) *Jean s' est cassé la jambe*
John REFL is broken the leg
"John has broken his leg"

(cf. Vet 1985) can be analysed in a similar way as involving reduction of the σ_1 satellite Beneficiary, where *se* is the reduction marker involved in various types of valency-reducing predicate formation rules.

These facts suggest that the domain of predicate formation rules is not the nuclear predication, but the core predication, i.e. the nuclear predication extended by σ_1 satellites.

(iii) Satellite absorption:
The term 'satellite absorption' has been used in two senses within the context of FG. First, it has been used to indicate the process through which a satellite gets absorbed into the predicate in some predicate formation rule (Kahrel 1985). Compare:

(91) a. Mary washes these clothes
b. *These clothes wash
c. These clothes wash easily

The valency reduction rule which removes the Agent argument of transitive *wash* at the same time requires that something is added to the derived predicate. Where this something is a satellite such as *easily*, we may say that this Manner satellite has been 'absorbed' into the derived predicate in the process of predicate formation, so as to become an argument. We assume that satellites will be more easily absorbed in this way when they are more closely associated with the nuclear predicate.

The second sense in which 'satellite absorption' has been used is to indicate the historical process through which an original satellite gets reinterpreted as an argument of the predicate to which it was originally more loosely attached. This process has been assumed (Pinkster 1988a; Mulder 1988) to underlie the phenomenon that in Latin and Greek certain two-place predicates have non-accusative second arguments. The facts are as follows.

In Latin, with verbs like *dolere* "to grieve for", the constituent which refers to the source or cause of the emotion is either marked by an ablative case form or by an accusative case form (cf. Pinkster 1988a):

(92) a. *Qui sociorum iniuriis ... doleat*
who allies.GEN.PL wrongs.ABL.PL deplores.3SG
"Who deplores our allies' wrongs"' (Cic.*Ver.*3,6)
b. *Meum casum luctumque doluerunt*
my misfortune.ACC.SG sorrow.ACC.SG.and grieved.3PL
"They grieved for my misfortune and sorrow" (Cic. *Sest.* 145)

Although in Classical Latin both the ablative in (92a) and the accusative in (92b) are best considered second arguments, from a historical point of view *iniuriis* in (92a) could be considered as a satellite of Cause or Source, which normally has an ablative case form. The use of the ablative for coding a second argument could then be understood by assuming that the satellite has gradually

been absorbed into the predicate frame, creating a two-place predicate *dolere* while retaining its original case form. The use of the accusative can then be seen as due to the Principle of Formal Adjustment (Dik 1985): the new two-place predicate adjusts its formal expression to the prototypical expression model for second arguments, viz. the accusative case form.

A similar development can according to Pinkster be assumed for compound verbs like *antecellere* "to surpass", which occur with either a dative or an accusative second argument. In this case a Beneficiary would have been absorbed into the predicate frame.

Mulder (1988: 235) defends a similar hypothetical scenario for the development of Ancient Greek non-accusative second arguments:

(93)

	relation to predicate	semantic function	expression
phase 1	satellite	non-Goal	non-accusative
phase 2	2nd argument	non-Goal	non-accusative
phase 3	2nd argument	Goal	accusative

A difference between Latin and Greek in this respect is, that in Greek even some of the predicates which are in the presumed phase 2 allow Subject assignment to the second argument, while in Latin such Subject assignment is not allowed.

Again, it could be assumed that historically, those satellites which are most closely associated with the nucleus will be more easily absorbed into the nuclear predicate frame.

3.2.1.3. Semantic constraints on the occurrence of satellites. A third fact which points to the argument-like behaviour of σ_1 satellites lies in the restrictions on their occurrence, which were already mentioned in 3.1.4 above. In general, satellites seem to be more constrained in their occurrence, the closer they are to the nucleus of the clause. Most σ_2 satellites occur freely with any type of SoA. When they are sensitive to [+control] SoAs (as is the case for Purpose and Reason (both σ_2 satellites)), they may nevertheless occur freely with *any* such SoA.

For the occurrence of σ_1 satellites more specific constraints must often be formulated. For example, Risselada (1987: 130) points out that intrinsically benefactive verbs in Greek, such as 'eat' or 'drink', which refer to [+control] SoAs, can nevertheless not be extended by a Beneficiary. In Dik (1975: 97) a subcategorization of Manner adverbs is given according to the specific types of

SoAs with which they may occur. Similar subcategorizations are given in Platt and Platt (1972) and Allerton and Cruttendon (1978). From these subcategorizations it is clear that rather specific semantic features of both predicate and Manner adverb are essential for describing the privileges of occurrence of 'inner' satellites. A last example of such more specific restrictions is provided by satellites of Source, Direction and Path, which are mainly restricted to movement predicates.

A further argument can be derived from the uses of the Latin ablative case. The ablative case is used for both 'outer' and 'inner' satellites with various semantic functions. Especially the occurrence of σ_1 satellites in the ablative is strongly dependent on the semantics of the nuclear predication.[15]

On the basis of such facts as these it could be argued that a predicate frame has a number of implied slots for σ_1 satellites which may but need not be filled. Moreover, the type of SoA is a property of the whole core predication (including the σ_1 satellites) rather than a property of only the nuclear predication. Thus, the following constructions have the same nucleus but describe two different SoA types ([+co][+dyn][-tel] in (94) and [+co][+dyn][+tel] in (95)), as evidenced by the different possibilities of adding σ_2 satellites:

(94) John drove from Amsterdam to Paris *for hours/in five hours

(95) John drove along the highway for hours/*in five hours

We saw in this section that 'inner' (σ_1) satellites in many ways behave differently from 'outer' (σ_2) satellites, are closer to arguments, and are more strongly associated with the semantics of the nuclear predication. This corresponds to the overall semantic difference between σ_1 and σ_2 satellites as conceptualized in this paper: σ_1 satellites specify additional features of the nuclear SoA, while σ_2 satellites serve to 'localize' the (specified) SoA in relation to temporal, spatial, and cognitive parameters.

3.2.2. Ordering and position differences. Differences in the ordering and position of predicate and predication satellites are extensively discussed in Quirk et al. (1985: 511-512). They note that what we call predication satellites are relatively free to occur in either sentence-initial or sentence-final position, as opposed to predicate satellites, which cannot freely occur in initial position:

(96) a. She kissed her mother **on the cheek**
b. ?**On the cheek**, she kissed her mother

(97) a. She kissed her mother **on the platform**
b. **On the platform**, she kissed her mother

These ordering differences can be interpreted as 'iconically' reflecting the relative scope differences between the satellites, in the sense that 'outer' or 'higher' satellites take 'inner' or 'lower' satellites in their scope. Further evidence for such a reflection of scope differences is found in the ordering of predicate and predication satellites relative to the predicate:

(98) a. She kissed her mother **on the cheek on the platform**
b. **On the platform**, she kissed her mother **on the cheek**
c. ?*She kissed her mother **on the platform on the cheek**
d. ?***On the cheek**, she kissed her mother **on the platform**

3.2.3. Paraphrase possibilities. In English, predication (σ_2) satellites allow for a paraphrase by means of corresponding nouns, as in the following examples (from Mackenzie and Hannay 1982):

(99) a. I met Sheila in the park
b. The place that I met Sheila was the park

(100) a. I met Sheila at three o'clock
b. The time that I met Sheila was three o'clock

Such paraphrases are not possible with predicate (σ_1) satellites:

(101) a. I approached the lion with great caution
b. *The way that I approached the lion was great caution

(102) a. I cut the meat with a knife
b. *The instrument that I cut the meat was a knife

Predication satellites allow a paraphrase with *occur*, *take place*, or *happen*, whereas predicate satellites do not:

(103) The event of John's travelling took place
in Europe
last summer
frequently
although he was ill
because he hadn't had a holiday for years...

(104) The event of John's travelling took place
*to Italy
*by train
*for Mary...

Again, these differences can be interpreted as reflecting the higher degree of independence of σ_2 satellites with respect to the content of the predication.

3.3. Proposition (σ_3) vs. Illocutionary (σ_4) satellites

The difference between proposition satellites and illocutionary satellites resides in the fact that the latter specify or modify the illocutionary force of an utterance, whereas the former modify the propositional content. Since propositions are within the scope of the illocution, we may expect that the differences between the two groups of satellites center around their behaviour with respect to the illocution. That this is indeed the case can be derived from some of the features which Greenbaum (1969) lists for illocutionary satellites:
(i) They may appear in front of questions:

(105) Seriously, how do I look?

(ii) Many may appear in front of imperative and optative clauses:

(106) Honestly, let's not tell him about it

In contrast, proposition satellites never occur in these positions:

(107) *Hopefully, how do I look?

(108) *Probably, let's not tell him about it

Proposition satellites in general presuppose the speaker's positive commitment to the truth of the proposition he presents. These satellites are therefore largely restricted to declarative sentences. They can be said to operate inside the illocutionary layer. Illocutionary satellites, on the other hand, operate outside the illocutionary layer, which is shown in their relative freedom to occur with any kind of sentence type.

3.4. Negation

As we have already seen in 3.1.3, predicate and predication satellites (σ_1 and σ_2 respectively) fall within the scope of the tense and (objective) modality operators as well as within the scope of (sentence) negation. In this section we examine more in detail the behaviour of the four satellite classes with respect to negation and show that negation provides useful criteria for distinguishing the different subcategories.

Before dealing with the behaviour of the satellites proper it is useful for our discussion to make some observations about the interpretation of negation in sentences without satellites. In doing so, we use some elementary concepts of model-theoretical semantics. Compare:

(109) a. Mary danced
b. Mary did not dance

In model-theoretical semantics (109a) is usually interpreted as follows: the referent denoted by *Mary* ([Mary]) belongs to the extension of the predicate *dance* ([dance]): in other words, [Mary] 0 [dance]. The negation (109b) indicates that Mary does not belong to the extension of the predicate *dance*: [Mary] $\emptyset$ [dance]. For sentences containing a two place predicate:

(110) a. Mary hit the cat
b. Mary did not hit the cat

the interpretation is that in (110a) the pair <[Mary], [cat]> belongs to the extension of the predicate *hit*, that is the set of all the pairs of individuals between which a hit-relation holds: <[Mary], [cat]> 0 [hit]. Sentence (110b) can be interpreted as <[Mary], [cat]> $\emptyset$ [hit], that is, the pair consisting of the referents of *Mary* and *the cat* does not belong to the set of pairs between which a hit-relation holds.

For our discussion it is important that while in nuclear predications sentence negation affects the relationship between the argument(s) and the predicate, this is not the case in sentences containing a predicate satellite (core predications). Compare:

(111) a. John died of pneumonia
b. John did not die of pneumonia

In (111b), at least in the dominant reading[16], John's dying is not negated. Rather, the negation affects the relationship between the nuclear predication (*John died*) as a whole and the Cause satellite. In (111a) the addressee is invited to accept the truth of *John died* and to accept pneumonia as being the cause of this event. In (111b) the addressee can safely admit that John died, but the speaker blocks the possibility to ascribe John's death to pneumonia. (111a) can be interpreted as: the SoA denoted by the nuclear predication ('John died') belongs to the set of events which are caused by pneumonia, whereas (111b) states that the SoA ('John died') is not a member of the set of events which are caused by pneumonia.

The other subcategories of predicate satellites can all be interpreted in the same way. For example:

(112) Mary did not dance elegantly

Here the negation indicates that the predicate *elegant(ly)* cannot be applied to the nuclear predication (*Mary danced*), or equivalently: the SoA denoted by *Mary danced* is not a member of the set of SoAs to which the predicate *elegant* can be truthfully applied. The interpretation of (113) is analogous to that given for (111b) and (112):

(113) John did not accompany Mary as her lawyer

Here the interpretation is that John accompanied Mary, but not as her lawyer. As in (111b) and (112) the negation does not affect the nuclear predication, but the predicate satellite *as her lawyer*.

In all the examples discussed so far the predicate satellites can be semantically interpreted as (second-order) predicates which take the nuclear predication of the sentence as their argument.[17] It is a general property of such predicate satellites that they are primarily affected by negation.

Let us now turn to the second category distinguished above, that of

predication (σ_2) satellites. The point to be examined here is whether the behaviour of this type of satellite differs from that of predicate satellites. Compare the following examples:

(114) a. John arrived at eight o'clock
b. John did not arrive at eight o'clock
c. At eight o'clock John did not arrive

The most striking difference with predicate satellites is that the (nuclear) predication can now be taken to be negated, i.e. fall within the scope of the negation: (114b) may mean that John arrived but that this event did not take place at eight o'clock, or that there was no event of John's arriving taking place at eight o'clock at all (the latter is the only interpretation of (114c)). In 3.2.2 it was already pointed out that predication satellites have greater freedom of occurrence than predicate satellites; they can be placed in front of the nuclear predication, in which case they do not fall within the scope of the negation in negative sentences such as (114c). A different intonational pattern may have the same effect in sentences such as (114b).

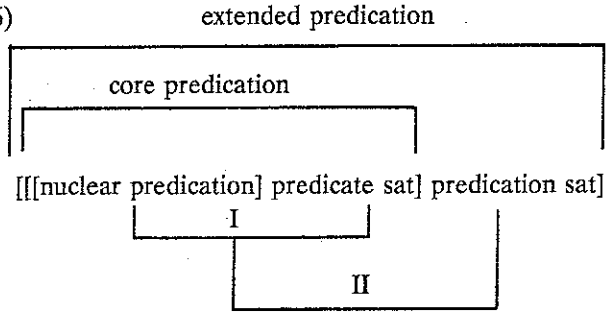
The fact that in (114) there are two negative sentences that correspond with one positive sentence has raised the question whether the positive sentence is structurally ambiguous. Kraak (1966: 156ff), for example, explains the existence of the two readings of the negative sentence by admitting that the corresponding positive sentence is structurally ambiguous. This ambiguity would be due to a different distribution of Focus.[18] Consider such a pair as:

(115) a. *Fred reisde met de trein vanwege de regen*
Fred travelled with the train because.of the rain
"Fred travelled by train because of the rain"
b. *Fred reisde niet met de trein vanwege de regen*
Fred travelled not with the train because.of the rain
"Fred did not travel by train because of the rain"

Sentence (115b) can be interpreted in at least two ways: (i) Fred travelled by train, but not because of the rain; (ii) Fred did not travel by train and did so because of the rain. Kraak admits two other readings: (iii) the 'strong' one we mentioned in note 16 ('Fred did not travel at all, not by train and not because of the rain') and (iv) one in which Fred travelled but not by train and not because of the rain. In our opinion these two interpretations, and especially the latter one, are highly improbable.

The analysis we propose is as follows. We adopt for (115a) the following structure:

(116)



The readings (i) and (ii) of (115b) correspond to the negation of the relations II and I, respectively. In the latter case it is said that Fred does not travel by train. If relation II is negated, it is claimed that Fred travels by train, but not because of the rain. The nuclear predication refers to a SoA ('Fred travelled') which is said to belong to the SoAs which take place by train. The core predication refers to a SoA ('he travelled by train') which is said to pertain to the set of SoAs which take place (or do not take place) because of the rain. We agree with Kraak that the different possible interpretations of (115a) and (115b) correspond with different Focus assignments. (115b) could be used to answer the following questions:

(117) a. By which means of transport did Fred travel because of the rain?
I do not know, but he did not travel by train.
b. Because of what did Fred (did Fred not) travel by train?
Because of the rain.

The reason why predication satellites can combine with a positive or negative core predication may be that circumstances expressed by predication satellites such as *because of the rain* can influence somebody's behaviour in a positive or a negative sense: both cancelling activities which were previously planned and doing things which were not planned because the rain creates a new situation. In the case of predicate satellites it is more difficult to imagine how these might specify something which would deny the validity of the nuclear predication. Consider an Instrument satellite such as that in:

(118) ((He did not kill the duckling) with an axe)

Such a construction can hardly be interpreted as 'he used the axe for not killing the duckling'. This shows that *with an axe*, as a predicate satellite, is an integral part of the specification of the SoA, rather than providing some kind of setting for the SoA as already established in the predication.

All predication satellites combine with negative or positive core predications, but also with positive or negative nuclear predications:

(119) a. Mary left because of the rain
b. Mary did not leave because of the rain

Depending on the distribution of Focus, (119a) may answer the following questions:

(120) a. What did Mary do because of the rain
(**left** is Focus in (119a))
b. Because of what did Mary leave?
(**because of the rain** is Focus)

In the same way (119b) can answer the following questions:

(121) a. What did Mary not do because of the rain?
(She did not leave)
b. Because of what did Mary leave?
(I don't know, she did not leave because of the rain)

In these cases either the nuclear predication (or at least its predicate) carries Focus, or the predication satellite. In core predications the nuclear predication (or its predicate, or one of its arguments) never carries Focus.

As far as proposition satellites and illocutionary satellites are concerned we can be brief. Neither of them can fall within the scope of negation, but the (nuclear, core or extended) predication they combine with can be positive or negative (with the corresponding Focus distributions). (Cf. Quirk et al. 1985.) For example:

(122) a. In my opinion we should do it/should not do it
b. We should not do it in my opinion

(122b) does not allow the interpretation that we should do it, but not in my opinion. In the same way, illocutionary satellites (*frankly*, *since you ask me*) cannot fall within the scope of the negation. The same explanation can be given for the fact that proposition satellites such as *possibly*, *probably* do not have negative counterparts (**impossibly*, **improbably*).

From these facts we can conclude that negation can be used as a criterion for distinguishing predicate satellites from predication satellites: the latter combine with negated predications, the former do not. The two satellite types have in common that they can both themselves be negated. Negation can also be used to distinguish proposition and illocutionary satellites from the rest (they never fall within the scope of the negation), but negation cannot serve as a criterion to distinguish between proposition satellites and illocutionary satellites since they show the same behaviour with respect to negation.

4. Other parameters

In the preceding sections we have tried to demonstrate that the position satellites occupy within the hierarchical structure of the clause to a large extent determines their behaviour. The hosting layer of the clause was the parameter along which we tried to arrive at a typology of satellites. This is not the only parameter that is relevant for such a typology, and we will discuss two more in this section. The first of these concerns the internal complexity of satellites. The second concerns the restrictive/non-restrictive opposition.

4.1. The internal structure of satellites

Satellites can have different degrees of internal complexity, as can easily be demonstrated by means of the following examples:

(123) Mary danced **beautifully**

(124) Mary danced **because she didn't want to talk to John**

The complexity of the Manner satellite *beautifully* in (123) is that of a mere predicate, the complexity of the Reason satellite *because she didn't want to talk to John* in (124) is that of a finite sentence.

Degrees of *internal* complexity of satellites can be defined in terms of the same hierarchical clause model (see 2.1) that was used earlier to define the satellite types in terms of what may be called their *external* complexity, the layer of the clause they attach to.

The construction with the highest degree of complexity is the whole clause structure. It contains a construction with a lower degree of complexity: a proposition. This proposition again contains a construction with a lower degree of complexity: a predication. Within the predication one finds two units of still lower complexity: predicates and terms. By peeling off layers from the hierarchical model of the clause one encounters all types of construction that can provide the structure of a satellite. It may be useful to give a formal definition of the several constructions mentioned here:

(125) clause	$(E_1: [ILL\ (S)\ (A)\ (X_1: [etc.]\ (X_1))]\ (E_1))$
proposition	$(X_1: [(e_1: [pred_\beta\ (x_1: [etc.]\ (x_1))]\ (e_1))]\ (X_1))$
predication	$(e_1: [pred_\beta\ (x_1: pred_N\ (x_1))]\ (e_1))$
term	$(x_1: pred_N\ (x_1))$
predicate	$pred_\beta$

A *predicate* designates a property or relation, a *term* an individual, a *predication* designates a SoA, a *proposition* a potential fact, and a *clause* designates a speech act. Not only are these different layers, both formally and semantically, relevant for the construction of main clauses, they also constitute a typology of emdedded constructions.[19]

This typology can be applied to the satellite types we have been concerned with. Consider the following series of examples:

(126) John met Peter **repeatedly**

(127) John met Peter **on the platform**

(128) John met Peter **after leaving the train**

(129) John met Peter **because he wanted to talk to him**

The satellites in (126)-(129) have all been classified as predication satellites (σ_2). They do not differ with respect to the layer that hosts them, but they do differ with respect to their internal complexity. The Frequency satellite *repeatedly* in (126) has the internal complexity of a predicate. It designates a

property (repeated) of the SoA described in the main clause. The Location satellite *on the platform* in (127) has the internal complexity of a term. It designates an *individual* (the platform), on which the SoA described in the main clause is situated. The Time satellite *after leaving the train* in (128) has the internal complexity of a predication. It designates a SoA (John's leaving the train) with respect to which the SoA described in the main clause is located in time. The Reason satellite *because he wanted to talk to him* in (129) has the internal complexity of a proposition. It designates the propositional content ('I want to talk to Peter') that motivated the occurrence of the SoA described in the main clause.

Just as we can distinguish between several types of predication satellites by looking at their internal complexity, so can we distinguish between several types of predicate satellites, proposition satellites, and illocutionary satellites. The following table gives an overview of the possibilities by cross-classifying satellites according to the two parameters discussed so far: external structure (ext) and internal structure (int). Note that this table is not intended to give an exhaustive listing of all satellites discussed in the preceding sections, but to give one illustrative example of each satellite type that results from combining the two parameters.

(130) **Internal and external structure of satellites**

ext \ int	$pred_\beta$	x	e	X
$pred_\beta$	Manner	Beneficiary	Force	–
e	Frequency	Location	Circumstance	Reason
X	Attitude	Source	Evidence	Motivation
ILL	Manner	Beneficiary	Condition	Reason

Apart from providing a second parameter for the classification of satellites, the specification of the internal complexity of a satellite predicts the kinds of distinctions that can be expressed within it, such as (in)definiteness in the case of satellites that have the internal complexity of a term, temporal distinctions in the case of satellites that have the internal complexity of a predication, and propositional attitudes in the case of satellites that have the internal complexity of a proposition.

4.2. Restrictive and non-restrictive satellites

Sometimes a distinction is made between restrictive and nonrestrictive satellites (e.g. Rutherford 1970; Quirk et al. 1985; Hannay and Vester 1987; Hengeveld 1989). Rutherford (1970) as a matter of fact uses these terms to make the distinction between our σ_2 and σ_3/σ_4 satellites. Most of his tests have already been discussed in 3.1 above. Quirk et al. (1985) only devote one paragraph to the topic, since, as they say, the distinction largely overlaps with their distinctions between adjuncts, disjuncts, etc. The opposition restrictive vs. nonrestrictive is, in their opinion, only relevant for their adjuncts (our σ_1 and σ_2 satellites). In fact all their examples of nonrestrictive adjuncts are of the σ_2 type. Disjuncts (σ_3 and σ_4 satellites) are necessarily nonrestrictive. In Hannay and Vester (1987) the examples with either a restrictive or a nonrestrictive adverbial clause are all of the σ_2 type; the same applies to Hengeveld (1989).

The interaction between satellite type and restrictiveness may thus be represented as follows:

(131)

	restrictive	nonrestrictive
σ_1	$\pi_2 e_1$: [pred x_1 x_2 σ_1] (e_1)	-
σ_2	$\pi_2 e_1$: [predication]: σ_2 (e_1)	$\pi_2 e_1$: [predication] (e_1), σ_2 (e_2)
σ_3	-	$\pi_3 X_1$: [ext pred] (X_1), σ_3 (X_2)
σ_4	-	$\pi_4 E_1$: [proposition] (E_1), σ_4 (E_2)

Predicate satellites (σ_1) necessarily contribute to the specification of the SoA: they are necessarily restrictive. Predication satellites may either restrict the nature of the SoA through providing it with time/space coordinates, or provide additional information to the SoA as already defined. Higher-level satellites necessarily provide additional information, pertaining to the speaker's evaluation of the (nature or occurrence of the) SoA, or to the communicative intentions with which the SoA is presented to the addressee. This is in accordance with the fact that the task of *representing* the SoA ends at the level of the extended predication.

The distinction restrictive vs. nonrestrictive can also be interpreted as a difference in scope: restrictive satellites fall under the scope of the corresponding operators; nonrestrictive satellites do not fall under the scope of these operators. We thus find confirmation for the status of the negative operator discussed in 3.4 above: predicate satellites are necessarily within the scope of negation, predication satellites may be within or outside the scope of the

negation, and higher-level satellites necessarily take the negation in their scope.

5. Conclusion

We argued in this paper that the layered structure of the clause, as proposed in Hengeveld (1989), provides a natural framework for the subcategorization of satellites. On mainly semantic grounds, we made a fourfold distinction between:

(132) a. **Predicate satellites** (σ_1):
Predicate satellites specify additional properties of the SoA desiganted by the nuclear predication.

b. **Predication satellites** (σ_2):
Predication satellites serve to localize the SoA as defined in the core predication with respect to temporal, local, and cognitive dimensions.

c. **Propositional satellites** (σ_3):
Propositional satellites specify the attitude of the speaker vis-à-vis the fact designated by the proposition.

d. **Illocutionary satellites** (σ_4):
Illocutionary satellites specify or modify the illocutionary force of the speech act in which the proposition is presented.

We then showed that this division into four layers correlates with a variety of differential coding and behavioural properties of satellites, and provides a natural place for many observations which have been made in the literature on adverbial constituents.

Negation was shown to interact in interesting ways with this layering of satellites. Finally, it was noted that satellites can be further subcategorized on the basis of their internal structure, and that the restrictive/non-restrictive contrast is distinctive only for predication satellites.

Many problems concerning the place of satellites in the layered model of the clause remain to be explored. For one thing, we have hardly touched the problem of the relations between different satellites at the same layer (e.g., the relations between Temporal and Local satellites, both predication satellites). Also, certain theoretical issues have been left unresolved. For example, the question whether satellites can be analysed as predicates over the units which they take in their scope (as proposed in Vet 1986), or should be regarded as some type of modifiers different from predicators (as in Dik 1989).

In spite of these open ends, however, we believe that we have demonstrated that the layered clause model provides for a more adequate typology of satellites, and conversely, that the natural way in which a variety of distinctions can be captured in this conception of clause structure reinforces the validity of the clause model itself.

Notes

1. We are grateful to the editors of this volume for critical remarks which led to improvements of the text.

2. See Hengeveld (1989) for a more elaborate description of this model. The status of the illocutionary component in (4) is based on Hengeveld's analysis. Compare Dik (1989) for a slightly different view. In the present paper we take the layered structure of the clause as described here as given, and consider what implications this would have for the analysis of satellites. Obviously, the layered model itself is under discussion as well (see, for example, Bolkestein 1989).

3. Compare the distinctions made in Dik (1989).

4. Bolkestein (1989) argues that predications may contain temporal satellites without having a tense operator. This might lead to a reconsideration of the analysis presented here.

5. In Hengeveld (1989) a fifth satellite type is distinguished at the level of the clause, which is used in order to account for the expression of interclausal relations. We restrict ourselves to the level of the clause here.

6. Most of the definitions given in the following sections are taken from Dik (1989).

7. Combination of two spatial setting satellites is possible only when one of them specifies a subregion of the other, as in *in Rome on the Forum, in Amsterdam near the central station*, etc. These might well be analysed as internally complex single satellites.

8. For formal differences between Reason and Cause satellites in Latin, compare Pinkster (1988b) and Bolkestein (this vol.).

9. For the German data, see Bartsch (1972, 1976).

10. For discussion of this example, see Levinson (1983: 256).

11. This difference between *quoniam* on the one hand and *quod/quia* appears to be relevant only in classical literary Latin.

12. See Dik (1978) and the discussion in Dik (1989).

13. Note that the verb takes the 'instrumental' voice when Subj is assigned to Temp. This is also reported for Kalagan.

14. For general discussion of incorporation see Mardirussian (1975), Dik (1980), Anderson (1985).

15. See Vester (1983) for what this implies for the relations between satellites of Manner, Cause, and Instrument, which in Latin can all be expressed in the ablative.

16. It is sometimes admitted that sentences such as (112) have another, 'strong' reading, paraphraseable as: 'Mary did not dance elegantly, because she did not dance at all'. In this interpretation the negation does have the nuclear predication in its scope. This kind of reading, however, is quite exceptional in normal usage. We will return briefly to this point at the end of this section.

17. In Vet (1986) it is argued that (certain) satellites can also be analysed as second-order predicates in the underlying structure of the clause. In Dik (1989) the satellites are associated as modifiers or specifiers with the layer which they take in their scope. We leave this difference unresolved here, since it does not affect the main theme of this paper.

18. On the interaction between negation and Focus, see also Bossuyt (1983).

19. See Hengeveld (this vol.) and Bolkestein (this vol.) for applications of this typology.

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