ALEXANDRA CORNILESCU

CONCEPT
OF
MODERN GRAMMAR

*To the memory
of my Father*

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A GENERATIVE GRAMMAR PERSPECTIVE

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Chapter 1

LINGUISTICS AND GRAMMAR

Linguistics as an Empirical Science
Methodological Problems in Structural and Transformational Grammars

1. Aim and motivation of this work

The present work falls within the province of general linguistic theory; it investigates problems of syntax and semantics centering around what is currently called the Principles and Parameters Framework (cf. Chomsky and Lasnik (1991)), also known as the Government-Binding Theory (cf. Chomsky (1981)). The latter represents the current stage in the development of generative grammar.

The most apparent aim of the book is to acquaint the Romanian reader with Parametric Grammar; launched by Chomsky's famous Pisa lectures (1979), published as Lectures on Government and Binding (=LGB), this model has been immensely successful. As a result of dissatisfaction with both Generative Semantics and Chomsky's Extended Standard Theory, as presented in Chomsky (1973, 1977), there followed a period of intense exploration into alternative syntactic models. An important book published in 1979 and surveying the then "Current Syntactic Approaches" mentions no fewer than fourteen more or less different syntactic models. Chomsky's LGB has put most (if not all) of these out of the market, dominating the eighties with unquestioned authority. In the estimations of a recent historian of linguistics in the US, "for the first time in over fifteen years, the vast majority of people doing syntax [in the States - AC] were working in the framework currently being developed by Chomsky" [Newmeyer, 1991: 223]. The publication of the Pisa Lectures roughly also coincides with the foundation of the GLOW Association, the association for "generative linguistics in the old world"; this society holds prestigious annual conferences which reunite generativists on both sides of the Atlantic Ocean, and its creation indicates the considerable penetration of generative theory in the European academic community. Indeed, there is hardly any theory - minded European journal, devoted to general linguistic problems, that fails to give space to generative theory.

A fact of interest for the Romanian linguistic community is the spectacular development of the comparative syntax of both Romance and Germanic languages, as well as of dialectology, with the descriptive apparatus of parametric grammar. At the same time, it is certainly worth mentioning that major oriental languages like Japanese, Mandarin Chinese and Korean have been intensely investigated within this framework, both in the US and in the mother countries. It is not, we think, an exaggeration to say that parametric grammar represents the "mainstream framework" of syntactic analysis.

As to the manner in which we conceived this work, we had to choose between a more technical presentation, stressing the niceties of formalization (such presentations are available in countries that have a well-developed generative tradition[1]), and a presentation which primarily aims at integrating the current problems of parametric grammar in the tradition of European grammar and reflection on language.

As stressed by Chomsky himself, parametric grammar represents one possible answer to, or one set of tentative hypotheses on, problems that have always been at the core of grammatical reflection. It proposes an explication and literalization of major traditional grammatical concepts and problems, such as: government, agreement, case, parts of speech, word order, etc. Such concepts and problems have constantly been addressed in linguistics, because they were thought to identify real linguistic phenomena which were found to be worth pursuing, so that no particular theory, GB included, can lay any proprietary claims on them. This opinion is clearly expressed by Chomsky (1992: 4): "In so far as the concept of government enters into the structure of human language, every approach will have a theory of government, and the common task will be to determine just what this concept is and what exactly are the principles that it observes. Similarly, no approach to language will fail to incorporate some version of binding theory, in so far as referential dependence is a real phenomenon to be captured in the study of language, this being a common enterprise".

It has been an important concern for us to lay stress precisely on such matters of general relevance in traditional descriptions and interpretations of language, problems which, in fact, transcend the model. At the same time, we have stressed the methodological continuity of generative, and earlier structural theory, in as much as both represent formal approaches to the study of language.

We thought it useful to include a critical presentation of the "standard" version of generative grammar, based on the 'Aspects' model since it is in this version of generative grammar that major works on Romanian have been produced (cf. Vasiliu-Golopenția Eretescu (1968), Pană (1974), (1976)), as well as descriptions of English or other languages, by Romanian linguists[2]). It was important to ascertain the merits and demerits of this model, trying to understand why it was superseded in later years. The presentation of the Aspects model was also important because most of the alternative approaches to syntax retain not only the general conception of the dialectics of universal and particular grammar, but also specific components of the Aspects model: Lexical Functional Grammars and Generalized Phrase Structure Grammars incorporate a phrase structure grammar of the kind present in 'Aspects', Arc-Pair Grammar makes use of transformations, again as designed in 'Aspects'.

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[1] See Riemsdijk, H. van, and E. Williams (1986) *Introduction to the Theory of Grammar* or Lasnik H. and A. Uriagereka (1988) *A Course in G B Syntax*.

[2] See the description of English or French etc. in Comnlescu (1976,1982), Şerban (1982), Ştefănescu (1978,1984), Maria Manoliu-Manea (1977), Tuţescu (1973), a. o.

This work is primarily an essay in syntactic theory, but, due to the way in which (universal) grammar (=UG) is conceived at present, the investigation necessarily goes beyond syntax into semantics and the lexicon.

UG is currently assumed to have a *modular* character, it consists of several different subtheories, each with its own principles and parameters, responsible for a certain aspect of grammatical analysis. A number of general concepts and principles act as linking elements of the various subtheories (e.g., government, The Principle of Full Interpretation).

While some modules (X-bar Theory, Case Theory) envisage configurational or other formal aspects, other subtheories are both syntactic and interpretative. The modules of Binding and Control, for instance deal with referential dependencies, i.e., with the referential interpretation of noun phrases, function of their inherent properties and their syntactic position. There are also modules which are more narrowly semantic; an example is the theory of thematic roles, which deals with the analysis of events in terms of their participant structure (for instance, verbs, which presumably denote events, are analysed in terms of the semantic roles of their arguments). The theory of thematic roles will then relate an element of lexical structure, namely, the argument structure of a predicate, with its syntactic realization in sentences containing the given predicate. The theory of thematic roles has profited from the advances in the study of lexical concepts within formal semantics and cognitive semantics (Jackendoff (1983, 1987), Emonds (1991), Carlson (1991), Bartsch (1992)).

A more recent gain of the theory has been a better understanding of the relation between syntax and the lexicon. On the one hand, it has been shown that the structure of phrases depends, to a large extent, if not completely, on the lexical properties of their lexical heads. On the other hand, particular concepts of syntax have been used to develop a "syntax of words" (see Selkirk (1982)), therefore, to develop the word-formation component of morphological theory.

There has also been a marked change in the way semantic representation is conceived of. What is now called the Logical Form component employs a modified version of the lower predicate calculus in the representation of sentences, with the result that generative linguistics has become more aware of, and interested in, the results obtained in the formal semantics of natural languages. One might perhaps say that current research is involved in maximizing the role of Logical Form in the overall explanation of linguistic phenomena, as well as in developing a better specified algorithmic procedure of mapping syntactic representations onto semantic ones.

An attempt will be made to stress, alongside of the ideas that represent constants of linguistic thought, those ideas that have more recently emerged and which have proved fruitful in the description of language.

It should also be stressed that the presentation is self-contained, presupposing little else than knowledge of high-school grammar. Understandably, examples are mostly drawn from English and Romanian, but also from other (familiar) Romance and Germanic languages.

2. Linguistics and Grammar

The theory of grammar is only one subdomain of the domain of linguistics, but it is the core segment of linguistics, through the centrality of the questions about language which grammar addresses. Linguistics has been defined as the science of language; like any science, it attempts to systematize and explain a domain of the empirical world. A legitimate question to ask is what facts of the empirical world constitute the object of linguistics. Milner (1989) proposes that there are three facts which delimit the empirical domain of linguistics: There is first the fact that people talk and that ability to speak is one of man's essential properties. Indeed, if we were to define man in terms of one distinctive property, we may be tempted to replace the Aristotelian 'Man is a rational animal (given the rather alarming degree of irrationality surrounding us), by the more modest, but not so easily falsifiable 'Man is a talking animal'. The fact that people can speak, the factum loquendi, implies that there is language. The existence of *language* is an axiom for linguistics. If one wondered on the conditions of possibility for language, one would be conducting an investigation within the philosophy of language, not linguistics. From the point of view of linguistics, language is given.

A second given fact of the world is that people speak *languages*, that is, not only is there language, but there are languages. In saying that there are languages, there are certain implicit presuppositions, such as: a) the presupposition that one knows what counts as one language; b) the presupposition that one can reliably distinguish between one language and another; c) the presupposition that, although languages are quite diverse in their structure, they are sufficiently alike to make up one natural kind, the kind language / languages. Some proof of their similarity is offered by the fact that languages are intertranslatable. Despite appearances, deciding that something is a language or even distinguishing between languages is not always an easy matter. For instance, what is the language spoken by a person who has studied English for one year? Moreover, boundaries between what we call languages are often arbitrarily drawn from the point of view of language structure, they are often drawn on the basis of socio-political criteria; Dutch and German, which count as "languages" are more alike than certain dialects of German, which count as varieties of "the same language".

A third axiomatic fact for linguistics is that languages can be described in terms of certain properties; this is the fact that there are grammars.

Linguistics is thus founded on the following empirical facts:
There is language (the 'factum loquendi').
There are languages (the 'factum linguae' and the 'factum linguarum').
There are grammars (the 'factum grammaticae').

A related question to ask regards the kind of observable data for linguistic science. The observable data used in linguistics are the examples. Notice that to quote an example is to make an implicit judgement on the example. For example, to quote 'The sky is blue' is to assert that 'The sky is blue' is a correct sentence of English.

2.1. The relation between linguistics and grammar is so intimate also because linguistics, as a comparatively more recent discipline, is founded on a quite ancient activity: grammatical activity. In the current opinion, grammar is associated with one social practice, namely, the teaching practice, and with one social institution, namely school. Yet grammar, as well as grammatical activity, is inseparably linked to any field of activity that investigates or essentially uses language; therefore, grammar is involved in any philological activity, such as: the editing and dating of a text, the editing and interpretation of a historical document, the editing and interpretation of legal texts, the compiling of dictionaires, all translation activities, etc. Moreover, one should never forget that any system of writing, however primitive, presupposes some grammar.

An important aspect of the grammarian's activity is what Milner (1989) calls the grammatical judgement. On the basis of his linguistic competence, the grammarian always makes a selection in the set of data he is confronted with. Not all the data are 'appropriate', 'suitable' for writing a grammar. Examples like 'He go' or 'I goes', or 'He didn't do nothing', may be attested, or recorded, yet the grammarian out to write a grammar of Emglish ignores them, judging them as 'wrong'. The grammarian makes a differential judgment: not any data which are materially possible (i.e., attested data or data that can be invented) count as grammatically possible. Data are always differentially classified, using dichotomies like correct / incorrect, grammatical / ungrammatical, possible / impossible. Examples are decontextualized, in the sense that the context of utterance, the identity of the speaker, etc. are all immaterial. Grammar is interested in the general, repeatable, abstract properties of language. Grammar relies on the presupposition that it is able to reveal objective properties of language, and that such properties exist and are expressible.

In other words, to quote Katz (1985): "Language is effable, as opposed to ineffable; the proof of the effability of language is grammar"

3. Structuralism and the formal study of language

Linguistics in the XXth century is marked by the advent of structuralism, which proposed a new theory and methodology in the study of language. Ignoring concrete matters of historical development[3]), one may speak about two qualitatively different stages in the evolution of linguistic structuralism: a) the stage of classical *analytical structuralism* (AS), which prevails in Europe and the US in the first half of the century; b) the stage of *synthetic structuralism*, i.e., the phase of generative grammar (GG), launched in 1957, with the publication of Chomsky's Syntactic Structures.

Important properties differentiate between structural and traditional grammars; some of these are less important since they represent matters of emphasis, *differences of degree, not of kind*. Such is the fact that structuralism takes into account the data objectively given at one point of time. Hence, there is emphasis on the spoken

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[3] For a presentation of the different structural schools see Maria Manoliu-Manea (1974)

language, on collecting a set of attested utterances (the corpus), which must be exhaustively analysed. As a result, a structural grammar tends to be synchronic, or rather panchronic, and descriptive, rather than normative. Traditional scholars often adopt a historical perspective in the writing of grammar; the monumental pre-structural English grammars all adopt a diachronic perspective as shown by some of their titles. Jespersen's (1909-1949) Modern English Grammar on Historical Principles, Poutsmas's (1926-1929) Grammar of Late Modern English. There is also, often, an a institutional concern with 'good English' or 'good Romanian', an attempt to guide linguistic practice, not (only) observe it, often by citing the memorable literary example. A prototypical traditional grammar tends to be diachronic and normative and to give priority to the written language (an obligatory element of diachronic studies).

There are also, however, *differences of kind* between structural and traditional grammars, distinctive features which have reshaped the domain of linguistics. One of these is the opposition between a holistic versus an atomistic conception of language. Traditional grammars implicitly assume that languages are atomistic collections of items which can be studied independently.

In contrast, structural linguistic systems are considered as ensembles of elements, subject to composition laws which characterize the whole ensemble. These laws confer to the linguistic whole properties different from those of its components. This conception opposes structural wholes to atomistic collections of objects, where the whole is the mere sum of its parts.

The crucial fact is that structural grammars are 'formal' while traditional grammars are 'notional', to some degree at least. Traditional grammars freely use meaning in the *definition of grammatical concepts*; therefore, they define linguistic concepts in substantial, extralinguistic terms. Here are familiar examples: a) "Substantivul este partea de vorbire flexibilă care denumește obiecte in sens larg, ființe, lucruri, fenomene, actiuni, stări, însușiri, relații". b) "Subiectul este partea de propoziție care arată cine înfăptuiește acțiunea exprimată de predicatul verbal sau cui i se atribuie o însușire exprimată prin numele predicativ" [cf. GA vol II, 1963: 87]. While such definitions may serve as useful starting points in a pre-theoretical understanding of these concepts, these definitions cannot be satisfactory, because they are subject to numerous counterexamples. Thus, even in a language like Romanian, which does not have formal subjects like the English *it* / *there*, it is hard to say that the defintion in (b) successfully identifies the subject in examples like. *Lui Ion nu-i plac filmele. Mariei îi trebuie ajutor*, since these sentences do not speak about 'actions' or 'properties'. A mixture of formal and semantic notions characterizes the so-called "modern traditional grammars"; from such a perspective, the subject in English might be defined as in (c), taken from Close (1972): c) "The subject is the sentence part which shows what or who the predicate is about, which occupies first position in the sentence and determines concord of the verb". Again, such a definition has obvious difficulties with any examples like: *Yesterday, it rained for two hours / Did it rain for two hours? / There weren't many boys in the classroom, were there?*, where the subject fails to satisfy one or more than one of the criterial attributes in (c).

Structural grammars claim to describe languages in terms of categories and objects existing *in* the language, not *outside* of it. Their perspective is *immanent*, rather than *transcendent.* Attention is focused not on the individual unit, but on the relations holding between them; in fact, units exist only by virtue of their inter-relations; their substantive content (if any) is immaterial in delimiting and defining the units. This thesis is clearly expressed by Hjelmslev [Prolegomena: 21], who offers the following description of formal definitions: 'In the formal definitions of the theory, it is not a question of trying to exhaust the intensional nature of the objects or even of delimiting them extensionally on all sides, but only of anchoring them relatively in respect to other objects, similarly defined or premised as basic." Therefore, formal definitions do not exhaustively present the objects from the point of view of their intension (i.e. sense) or of their extension (i.e., their reference). They merely attempt to establish the *place of the object defined in relation to other objects*, similarly defined or taken as primitives. Fries, the author of a *Structure of English*, used for many years as a high-school textbook in the US, offered the following kind of definitions for "the word classes" nouns and verbs.

(1) The noun: The word class whose members occur in the context
   "The ---- is / are good."
(2) The verb: The word class whose members occur in the contexts:
   a. **to**---(to ask); b.---**ing** (asking); c.--- **s** (asks) d.--- **ed** (asked)

Similarly, in generative grammars, a transitive verb is no longer defined as a verb whose action "passes onto an object", but simply as a verb that occurs immediately before a nominal phrase, i.e., in the context --- NP. Examples like the following are better dealt with by the formal definition than by the notional one: *I saw Mary / They didn't hit it off together.*

The definiton of individual units through their position in the network of linguistic structure presupposes a clear notion of the organization of language into hierarchical levels, and a clear conception of the relations holding between these levels of language. Structural grammars advance and develop the idea that the hierchical levels of language (e.g., the phonological level, the morphological level, etc) are inter-related and that they have *isomorphic organization*. The postulation of an isomorphic structure of the linguistic levels significantly contributed to the development of linguistic analysis, because it became possible to transfer from one level to another methods or techniques of analyses that had proved useful in dealing with linguistic data. For instance, in a now famous paper, Eugenio Coșeriu (1964) proves that the lexicon of a language is a structured system, by showing that there hold between lexical units relations which are analogous to the relations which characterize the phonological structure of a language. "Dans ce qui suit, nous prendrons pour modèle la phonologie et comparerons des structures lexicales avec des structures phonologiques. Nous ne

prétendons pas démonstrer que *tout* le lexique est organisé comme le système des phonèmes, mais uniquement qu'on peut trouver dans le lexique des structures similaires à celles de la phonologie et susceptibles, par conséquent, d'un traitement analogue."

A general result of the study of languages as formal systems of signs was the *autonomy of linguistics, as a discipline.*

3.1. The description of languages as formal objects raised the important issue of *formalization* in linguistics, i.e., the problem of *constructing a metalanguage*, capable to express the relations shown to hold between linguistic objects. Defining an appropriate metalanguage for grammars has remained a vital issue for linguists.

A science may be viewed as a system of statements S on some domain of the world. The statements in S are related not only through their subject-matter, but also because they must meet certain logical conditions; for instance, the systems S should be consistent, i.e., it should not be the case, for any statement P, that the system S contains both P and its negation. The discourse of a science is or, at least, may be, ordered by axiomatization. Certain concepts and statements are considered as given and the rest of the discourse is derived from this basis.

Taking into account the kind of justification offered for including a statement P in the system S of some science, it is customary to distinguish two models of science in the European tradition (cf. Pârvu,(1978)), the model of *categorial-deductive science* and the model of *hypothetical-deductive science*. The first is a model of rational science (represented by Aristotel, Descartes, Leibniz, a.o.), and is also known as the Aristotelian model of science, the second is a model of empirical science, first outlined in the works of Galileo Galilei. Here is a summary presentation of each.

The Aristotelian model of science (the model of categorial deductive science). A categorical-deductive science is a system of statements S, which meet the following conditions:

I. Any statment of S must directly or indirectly refer to a specific domain of real entities.

II. Any statement of S should be true.

III. If a statement belongs to S, any logical consequence of that statement belongs to S and is true [this is the Deductive Postulate].

IV. There are in S certain basic terms such that: a) their meaning is so obvious that they do not need any further explanation; b) other terms in S should be defined on the basis of those which are intuitively clear.

V. There is in S a finite number of statements such that: a) their truth is so evident that they do not need any further proof; b) any other statement in S should be derived (deduced) starting from these statements.

This is a model of rational science, in as much as the basic terms and basic statemetns are accepted because they are self-evident to human reason, because they possess such attributes as clarity, certitude, etc; no other proof than rational certitude is needed.

The Galilean model of science is a model of empirical science. This model represents a more recent European creation (the XVII - th century); it represetns a revolution in the history of human thought, marking a shift from the contemplation of nature to a very active attitude regarding nature; there is now a permanent and systematic interrogation of nature. The ingredients of the new type of science are *experiment* and *mathematicization*. The systematic dialogue with nature is conducted in the language of mathematics, viewed as a science of qualitative relations. The mathematicization of theories opens up a new horizon of the real, it broadens to infinity the confines of the empirical world, and strengthens the means for operationally checking the proposed hypotheses.

A Galilean science is, expectedly, a system of statements bearing on some empirical domain. Most of these statements represent *hypotheses on the structure of the real*. The novelty lies in the fact that these hypotheses have testable consequences, that is, consequences which can be tested by *experimentation*. The experiment, as part of the active confrontation with nature, may confirm or falsify any of these hypotheses. These hypotheses are logically ordered, each deriving from some set of preceding ones. They are accepted as true only after experimental verification; they are susceptible of revision, can be criticized and superseded by better ones [cf. Popper, The Logic of Discovery].

According to Milner (1989), the theory of classical analytical structuralism may be interpreted as an example of rational, Aristotelian science, relying as it does, on a minimum of rationally obvious statements and concepts and employing a miminun of formalization. In contrast, generative grammar explicitly conceives itself as an example of Galilean science.

4. Theory and methodology in classical analytical structuralism

Classical Analytical Structuralism(=CAS) as an Aristotelian science . It is an axiomatic statement of CAS that language is a system of signs having a hidden immanent structure. The goal of linguistic research is to throw light on this hidden immanent structure; in attempting to do so, CAS has produced the first "litteralization of the empirical domain of linguistics", i.e., the first formalization in linguistics. The type of formalization employed relies on a very limited number of concepts, the central ones being those of *opposition* and *relation* (both being primitive of linguistics, definable in set-theory, as shown below).

The following celebrated statement, due to de Saussure, expresses one of the rationally indisputable beliefs of structuralist theory: "De même que le jeu d'échecs est tout entier dans la combinaison des différentes pièces, de même la langue a le caractère d'un système basé complétement sur l'opposition de ses unités concrètes." Language is entirely based on oppositions.

A second equally indisputable statement is that units only exist by virtue of their relations, each one of them being what the others are not.

Starting from these basic statements, linguistic structuralism develops a theory of oppositions and a theory of relations.

4.1. *On oppositions.* The foundations of the theory of oppositions were laid by Trubetskoy (Principes de Phonologie). "Opposition" is a primitive concept, as far as linguistics is concerned. Any oppositions presupposes a basis of comparison (a common element, shared by the opposed terms) and a differentiating feature, called the characteristic of the opposition. In (3) it is apparent that the characteristic of the opposition p: b is the feature [+ voice], vhile the other distinctive features of the phonemes p, b form the basis of the opposition.

(3)
	p	b	
	+consonant	+consonant	base of the opposition
	+bilabial	+bilabial	
	+plosive	+plosive	
---	---	---	---
	+voice	-voice	characteristic of the opposition

The concept of opposition can be defined in set theoretic terms (cf. Manoliu Manea (1974), Marcus (1970) as follows:

An opposition is an ordered pair of sets of elements A: B. The elements common to sets A, b form the *base* of the opposition. The elements of A which are not elements of B, and those elements of B which are not elements of A form the *differntial set* of A: B, or the characteristic of the opposition A: B. Consider the opposition *om: oamenilor*, analysable as in (4):

(4)
	om : oamenilor		
	+ noun		base
	+ masc		
---	---	---	---
	+ Nom-Acc	+Gen-Dat	differential set
	+ singular	+ plural	

The most commonly acknowledged types of (binary) oppositions are listed below:

a) *Privative oppositions* - One term is positively marked for a feature absent in the other term. Here are examples:

(5)

	A	: B	
a.	p	: b	'b' has the feature [+ voice], missing in'p'
b.	horse	: mare	'The semantic features of *horse* are included in those of *mare*, but mare contains the additional feature [+ female]
c.			
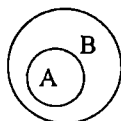
Privative oppositions are the most characteristic, since they arc binary and oriented; the term positively marked for the 'additional feature' is the 'marked' term of the opposition.

b) *Equipolent oppositions* - Both terms A, B have specific differential features; in set-theoretic terms, some of the elements A also belong to B, and some elements of B also belong to A. An example is the opposition $p:v$; p is plosive and voiceless; v is labiodental and voiced; both sharer the fact of being consonants. Another example is the lexical opposition *sizzle : crackle*.

(6)   A : B

a.   p : v
          [+ cons]

+ plosive   labiodental
- voice   + voice
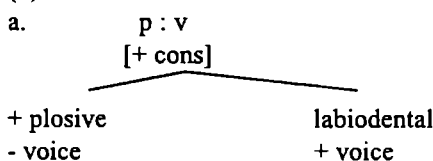
b.   sizzle : crackle
           + verb
           + make noise

[about meat in the pan]   [about wood in the fire]

c.

c) *Disjunctive oppositions* - In this case, no element of A is an element of B. This represetns a suspension of an opposition, since A and B cannot, in fact, be compared. Examples can be given with ease.

(7) a.
          A   :   B
         and   :   sang
     + conjunction   + verb
     + copulative   + indicative
                    + past tense
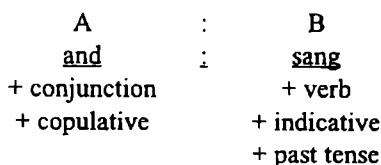
b.

d) *The zero opposition* - This is the case where the differential set does not contain any element. Consider, (in 8), the elements *carte / casă* with respect to

their grammatical features; they are completely alike; naturally, they have different lexical content.

(8)   A:B
    a.carte:casă
    + Nom-Acc
    + feminine
    + singular

b.

$$\boxed{A / B}$$

The next categories of oppositions refer to classes of oppositions; this allows for generalization; for grouping larger number of elements into functional classes.

e) *Proportional oppositions* - Two or more than two oppositions are said to be proportional, if they have the same differential set, i.e., the same characteristic. Several oppositions that have the same characteristic form a *correlation*. Below, we have illustrated the correlations of voice, and of sex (+MALE vs +FEMALE) in English.

(9)

a.		b.	
[- voice]	[+ voice]	+ MALE	+FEMALE
p	b	stallion	mare
f	v	billy-goat	nanny-goat
s	z	father	mother
t	d	jack-ass	jenny-ass

f) *Homogeneous oppositions* - Two oppositions are said to be homogeneous if they have the same basis.

(10)

casă	casa
casa	caselor
casa	casei

The three oppositions in (10) have the same basis: the segment *cas-*, a lexical root. Homogeneous oppositions help setting up the traditional paradigms: the *declension* of a noun and the *conjugation* of a verb.

In spite of the linguists' desire to reduce all linguistic differences to binary oppositions, in agreement with the programmatic statement quoted above, it was soon apparent that many-membered oppositions must also be acknowledged to exist. The Prague School (Vigo Brondal, a.o.) described elementary three-term structures of the following sort:

(11)
a. *positive* / *neuter* (neither positive nor negative) / *negative**
  she   it   he
b. *positive complex* (either positive or negative) *negative*
sister   sibling   brother
mother   parent   father

There have been attempts to reduce three-term oppositions to a hierarchy of binary ones. The opposition 'positive' / 'neuter' / 'negative' may be re-analyzed as in (12). Such reinterpretations showed a desire to give maximum scope to binary oppositions.

(12)   [+ neuter]   [- neuter]
        it   positive   negative
                        she   he

A second type of non-binary, multi-membered oppositions is represented by gradual oppositions. For instance, the English front vowels may be arranged function of the degree of opening between the raised part of the tongue and the palate:

(15) a.   i: close   Pete   He's Pete.
           i   pit   It's a pit.
           e   mid-open   pet   It's a pet.
           æ   open   Patty   She's Patty.

Many-membered oppositions, gradual or non-gradual(cf.(Horn (1971)), are fairly frequent in the lexicon:

(15)b.   gradual:{frozen, cold, cool}
          non-gradual:{blue: red: green: yellow:....}

In addition to the classification of oppositions, two problems apparently prevailed in structuralist theory: a) whether all oppositions were binary; (the answer to that question is negative); b) whether all binary oppositions are 'oriented', having one 'marked', more restricted or intensive) term, and one 'unmarked' term. As already shown, privative oppositions (e.g. *horse:mare*) are, by defintion, 'oriented'. Binary oppositions which are not privative (e.g. *young:old*) may also be oriented, and there are different linguistic means of identifiying the marked / unmarked member of an opposition. Perhaps the best known means of determining the orientation of an

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* He is the 'unmarked term, since it is also used as an anaphor for indefinite pronouns, which are unspecified for gender: Somebody called up, but he didn't say what he wanted

opposition is the neutralization of an opposition; it is the unmarked term of an opposition which occurs in contexts where the opposition is suspended. The examples below show that *old* is the unmarked term of the opposition *old / young*; *old* may cover the whole semantic space of the dimension AGE, while *young* may cover only one part of it (cf. (16 b)).

(16) a. He is an old man.
       b. He is a young man.
(17) a. How old /*young is the baby ?
       b. The baby is three days old /*young.

In summary, we may safely conclude that binary oppositions are the building block of formalization and of representing the hidden structure of language.

4.2. *On syntagmatic and paradigmatic relations*. Linguistic units entertain mutual relations on the vertical paradigmatic axis, or on the horizontal, syntagmatic axis. Units standing in opposition are mutually exclusive, only one of them may be used in a given context. The terms of an oppositons contract a relation of substitution, an *either ... or* relation on the paradigmatic axis (cf. Hjelmslev).

(18) a.   How |old | is he ?
                  | young
       b.   p| i: | t
                  | i |
                  | e |
                  | æ |

Units in a paradigmatic *either...or* relation may replace each other in the same position. Since only one unit in the set is used at one time, paradigmatic *either...or* relations are also called relations *in absentia*. But substitution requires a context where the oppositive elements are successively tested, as in (18 a, b) above. The units of this context contract syntagmatic relations, relations *in praesentia*, also called *both and relations* (cf. Hjelmslev).

The distinction itself between syntagmatic and paradigmatic relations is not new: models of declension and conjugation were clear instances of paradigms, while syntax traditionally deals with (syntagmatic) relations in praesentia. The novelty of the conception was to consider those two types of relations as fundamental axes in the organization of all units, on all linguistic levels. The theoretically important point is that the structure of the linguistic system depends on every level, upon the complementary principles of selection out of a paradigm and combination into a syntagm. To describe a linguistic system is to specify both the membership of the paradigmatic sets and the posibilities of combination of one set with another one, in well-formed syntagms.

Both syntagmatic and paradigmatic relations may obey certain constraints, it is, consequently, possible to identify several types of relations; some of these are listed below.

a) *Relations of determination*: A and B stand in a relation of determination if A presupposes B, but B does not presupposes A. In syntax, the use of an article presupposes the use of a noun, but a noun may sometimes be used in the absence of an article.

(19)   a. The students /*The - were unhappy.
         b. Students are smart.

b) *Relations of interdependence*, where term A presupposes term B, and term B presupposes term A. For instance, in morphology, the features [+ Tense], [+ Person] in any finite verbal form presuppose each other (i.e., they always occur together).

(20)   a.citisem   citeai
         [+ Past Perfect] [+ Imperfect]
         [+ 1st Person]   [+ 2nd Person]

Relation of determination and interdependence are both obligatory relations. There are also optional relations.

c) *Constellations* are optioanl relations. Term A does not presuppose term B, term B does not presuppose term A. Thus, in German, the preposition *in* occurs with the Accusative case or with the Dative case, both the Dative and the Accusative also occur without *in*.

(21)   Er geht ins Zimmer.[in +Acc]
         Er ist im Zimmer.[in +Dat]
         Ich hilfe dem Kind.[Dat]
         Ich sehe das Kind.[Acc]

.   4.3. *Conclusion*. This sketchy presentation of classical structuralism has hopefully shown that this theory is founded on a few maximally general undefined concepts and on a few statements whose truth is self-evident. (e.g., Language structure is founded on oppositions. Units exist only through their mutual relations.) Other statements turn around these basic ones. Formalization is maximally simple, in the absence of any more complex formal machinery. One might conclude by saying that the epistemiological matrix implicit in Analytical Structuralism is that of a categorial deductive science.

5. The methodology of CAS
The empirical descriptive nature of linguistics as a science was, however, self-evident to structuralists. They have been highly successful in developing empirical methods of linguistic analysis, which are still currently used in linguistics: the methodological contribution of analytical structuralism, of American descriptivism in

particular cannot be overestimated. In the context of inquiry, typical of American descriptivism, with its heavy emphasis on the study of the dying American Indian languages, the proposed model of the linguist is that of the field worker, out to collect his data and write the grammar (of an unknown language). As remarked by Chomsky years later [cf. Chomsky, 1973], "the field worker armed with nothing but raw phonetic data and *bringing no particular hypothesis about the language he was investigating was an idealization of a radical sort"*. The linguist was not supposed to have any expectations about the structure of the investigated language. His task was to collect data and classify his corpus, offering a taxonomy of the data, and thus laying bare the structure of the language. The corpus, usually compiled with the help of a native informant, consists of a set of recorded or written material. The linguist is supposed to establish the invariant units on each lunguistic level using 'discovery procedures'; these were conceived of as rigurous inductive methods of language analysis, capable to uncover the immanent structure of language. Essentially, the famous discovery procedures were techniques of segmenting and delimiting units on a continuous flux, means of revealing the articulation of forms, in the continuum of substance (see below).

5.1. A key concept employed in the analysis is that of distribution. *Distribution* is defined as the totality of environments where a given segment (unit) occurs. Several types of distribution) have proved relevant in linguistic analysis(cf. Manoliu-Manea(1974), Marcus(1966:36:

a) *Complementary distribution*. Two terms A and B are in complementary distribution just in case A never occurs in any of the contexts of B and the other way round. The phonological segments /s/, /z/, /iz/, are in complementary distribution, as markers of the plural of English nouns, each selecting a nominal base whose last phoneme has specifiec properties:

(22)	|- sybillant|$_N$	/s/	cups	/kʌps/
	|- voice |$_N$			
	|- sybillant|	/z/	dogs	/dogz/
	|+ voice |$_N$			
	|+ sybillant|$_N$	/iz/	dresses	/ dresiz/
			fuzzes	⟍ / fʌziz/

b) *Defective distribution*. Two terms A, B·are in defective distribution, if A occurs in all the contexts of B, but B may also occur in contexts where A does not occur, i.e. the contextes of occurrence of A are included in the contexts of occurrence of B, or the other way round. Thus, with oriented antonymic pairs. (*old / young, long /short*), the marked terms has all the contexts of occurrence of the unmarked term, but the unmarked term also occurs in neutralization contexts, where the opposition is suspended.

(23)   a. He is old / young.
         b. an old / young man
         c. How old / *young is he ?

c) *Equipolent distribution*: Two terms A and B are said to have equipolent distribution: if they share some of their contexts, but each also has a number of different contexts. For instance in Romanian, there are verbs which select either the indicative mood or the subjunctive mood (e.g. *crede, spera, a se indoi*, a. o.), but there are also verbs which select only the indicative (*afirma, declara*, a.o.) or only the subjunctive (*a cere, a vrea, a dori*).Therefore, the indicative and the subjunctive mood are in equipolent distribution.

(24)   a. Sper că vine / să vină.
             b. Declar că vine / *să vină.
             c. Vreau *că vine / să vină.

d) *Contrastive distribution*: two terms A and B are in contrastive distribution, if they share all the contexts. For instance, the varieties of a phoneme, representing the individual pronunciatiation of various speakers are in contrastive distribtion.

5.2. As already mentioned, the procedure of uncovering the units of the linguistic system starts by making preliminary cuts in the continuum of substance, setting up tentative units.

Different structural schools may employ different procedures in establishing the invariants of the system. There are structureal schools which regard the sign as a two-level entity, composed of a signifier (form) and a signified (concept, sense) (e.g., all European schools and some of the American ones(see Manoliu-Manea(1974) for more specific information)). In this case, the procedures for setting up invariants rely on segmentation and on the commutation test. In the following excerpts, taken from Nida's Morphology, one can see these notions at work, in trying to determine which phonemic segments belong to the same morpheme. Nida proposes several principles, which allow one to establish the invariants of the morphemic level:

Principle 1: "Forms which have a common semantic distinctiveness and an identical phonemic form in all their occurrences constitute a single morpheme".This principle allows the linguist to separate -ER as a morpheme given the series:

(25) dancer, writer, flier   ----ER

This principle employs the phrase "common semantic distinctiveness" as a way of indicating the meaning which is common to all the occurrences of the ER suffix . ER contrsts with the meaning of all other similar forms; such as the *-er* of the comparative degree (e.g., *wider, broader*). The series *dancer, writer, broader* would yield no

distinctiveness of meaning, indicating that no morphemic segment can be separated, despite the occurrence of the same phonemic segment *er*. Crucial use is made of the dual nature of the sign.

Principle 2: "Forms which have a common semantic distincitveness may constitute a morphemic segment provided that the distribution of formal differences is phonologically definable. This is the principle of the phonologically conditioned allomorphs which are in complementary distribution: The negative prefix *in* (e.g., *infelicitous*) is represented as the following set of phonologically-conditioned allomorphs {*in, il, ir, im*}. The choice is determined by the phonological properties of the first phoneme of the stem, by assimilation, as can be seen in (26):

(26) a. im [- + bilabial consonant]$_A$ (impersonal, imperfect)
      b. ir [+ r   ]$_A$ (irrefutable)
      c. il [+ l   ]$_A$ (illicit)
      d. in[....]$_A$ everywhere else   (intolerant, inaudible, infelicitous)

According to (26), the allomorph *in* is excluded in contexts a-c, and is used everywhere else).

As known, Harris, and more generally, the Pennsylvania School, refused any reliance on meaning in linguistic analysis, so that the commutation test becomes inoperant in setting up invariants. Linguistic units need not be signs, if the sign is necessarily endowed with meaning. Linguistic units are identified as such by virtue of their formal properties, but they need not have meaning. It is desirable to analyze -*stand* as a morpheme in *understand, withstand,* in virute of the alternation (*stand - stood, understand / understood, withstand / withstood*), but it would be hard to assign meaning to the units (*under-, with-,* and *stand*) obtained in the analysis. In the celebrated Methods in Structural Linguistics, Harris presents narrowly formal procedures for setting up tentative phonemic and then, morphemic segments. To estabalish the independence of the tentative units, he further relies only on distributional evidence. Here are some of the procedures he proposed for setting up tentative units and for testing whether they are independent units (invariants), on the morphological level.

Tentative morphemic segments - A phoneme sequence is decomposable into morphemes if one part occurs without the other in the same total environment. This criterion allows us to set up the following tentative morphemic segments {*room, -er, London*} in the total environment: *That is our -.*

(27)   That's our |roomer
                         | room
                         | London
                         | Londoner

Independent units - A particular sequence is said to be independent only if it occurs in a variety of different environments and if it patterns like other units. Therefore one attempts to set up classes of units, on the basis of their distribution, i.e., classes of units that "pattern alike". Consider the examples below.

(28)   a.   The | hammer | is here.
                    |governor |
                    | distributor |
                    |writer |

      b.   I would like to | *ham | them.
                           | govern |
                           | distribute |
                           | write |

      c.   They didn't | *ham | them.
                        |govern |
                      |distribute |
                      |write |

      d.   While |*hamming | them.
                      |governing |
                      |distributing |
                      |writing |

The examples in (28 a) yield the segments {*ham, govern, distribute, write, -er*}. The consideration of (28b, c, d) proves that the segmentation *ham +er* is incorrect, while the segmentations *govern +or, distribute +or, write +er* are correct. The units *govern, distribute, write* share a number of contexts: *to-, didn't-, -ing*, which identify them as members of one distributional clase (the verb).

5.3. *Conclusions*. Classical structuralism has offered the first model of formal analysis. Structural theorists put forth a rigorously formalized, refined and sophisticated battery of taxonomic procedures, used to segment and classify the data. These methods were understood as *discovery procedures* for grammars, in the sense that, when applied to a corpus, they were supposed to *determine a grammar of the language* from which the corpus was drawn.

The philosophical presuppositions of this methodology continue the empiricist tradition. Knowledge is essentially assumed to be data-processing. The mind, initially tabula rasa, does not possess more than a system of properties enabling it to realize an initial analysis of the data given by the senses. The higher systems of knowledge and belief may then develop, by means of generalization, analogy, induction, association and habit-formation procedures.

Language is assumed to be a self-sufficient, independent system, having an immanent constitutive structure that must be laid bare by the linguist, using discovery procedures. At least for some major practitioners (Harris, Bloch, a.o.), there are no psychological assumptions behind the discovery procedures. For instance, they are not

supposed to be empirical hypotheses as to how knowledge of language is acquired. Justification of one analysis over another one will be done in merely pragmatic terms, by showing that it offers a more organized, less redundant characterization of the corpus. In priciple, alternative theories or sets of procedures that work for the same corpus are equally valid.

As to the scope of the taxonomic procedures, analysis is restricted to those properties explicitly (overtly) present in the signal.

Structuralism was particularly successful in the domain of phonology, because of the finite nature of the domain, and also perhaps because, at this level, there is a clearly marked distinction between substance and form, i.e., between phonetics and phonology. Morphology was also developed later, but there is little syntax to speak of (except for immediate constituent analysis, see Wells (1947)).

Through the rigorous methodology it proposed, CAS has enormously broadened the scope of information available to the linguist, and has considerably increased the reliability of the data, raising the precision of linguistic discourse to entirely new levels. The outcome was a professionalization of the field, a shift of interest away from philosophical problems of general interest to intellectuals towards a new domain, largely defined by the techniques that the profession itself had forged in the solving of certain empirical problems.

6. Generative Grammars (GG)

One can undoubtedly assert that GG represents a second stage of linguistic structuralism (cf. Manoliu-Manea (1974)). This is obvious: a) in the holistic approach to language viewed as a system of relations; b) in the consideration of languages as formal objects, with the subsequent reliance on formal definitions. Moreover, GG inherits the methodological concepts and techniques employed by structuralist grammarians (distribution, constituency, binary opposition, etc.). There is, therefore, an important conceptual and methodological continuity between analytical structuralism and generative grammar.

6.1. At the same time, there is a marked theoretical and epistemological discontinuity between CAS and GG, which explains why the advent of GG was interpreted as a "revolution in linguistics"(cf Searle(1974)), as a change of paradigm in the Kuhnian sense. GG was born, as will be seen, out of an attempt to answer characteristic empirical problems and also, out of an attempt to smooth out certain methodological difficulties. The study of GG reveals in a particularly telling fashion how reflection on certain empirical problems leads to particular epistemological claims, regarding the construction of grammar, and even to particular ontological claims, regarding the ontological status of grammar. Linguistics comes to be envisaged as a Galilean science, there is thus an avowed change of epistemological matrix. Secondly, the complexity of grammars as objects of learning will lead to the conception that the human mind is endowed with a language faculty, enabling it to acquire a language. There is a movement away from the idea of mind as a blank at birth, to a rationalist conception of mind as a complex modular organ (cf. Fodor (1983)), equipped for

specific cognitive tasks. Viewed in retrospect, GG may be considered part of the "cognitive revolution of the 1950s" (Chomsky 1992: 4).

There are two, now famous, empirical problems that GG has called attention to (cf.D'Agosttino (1989)). a) The first problem is that of *linguistic creativity*. The problem is that the normal use of language is innovative and potentially infinite, in the sense that that much of what we say in the course of common language use is not a repetition of anything we have heard or said before. Similarly, the number of sentences in one's native language that one will understand without any feeling of difficulty is astronomical."The central fact to which any significant linguistic theory must address itself is that the typical language learner has observed [only] a certain limited set of utterances of his language, but can, on the basis of this finite linguistic experience, produce and understand an indefinite number of new utterances." (Chomsky 1973). Language users who produce (or understand) sentences which are new to their experience manifest their *linguistic productivity*, one facet of their creative use of language. As shown as early as Cartesian grammar (the 17th century), the creative use of language meant not only "productivity", but also the fact that the normal use of language, in addition to being innovative, is also *free from control of detectable stimuli* and "*appropriate to the situation*" (cf. Chomsky,1968). These complex abilities of the human person are among the 'anthropological mysteries' that do not fall into the more limited province of linguistics. The first empirical problem is then, how to account for the speakers' capacity of producing and understanding a potentially infintie number of new sentences.

To answer this question, generative theory claims that users produce and understand new sentences because they *possess an internalized grammar*, a device which provides a semantic and a phonetic interpretation for any sentence of the given language, L. Any grammar of L will project the finite and somewhat accidental set of observed utterances to a presumably infinite set of grammatical utterances the speaker can produce or understand.

The internalized grammar is the speaker's *competence*, the speaker's *tacit knowledge of his language*. In (1965), Chomsky was launching the well-known dichotomy of *competence* versus *performance*. Competence - was a dispositional property, the S's internalized grammar which enables the speaker to use language. Performance represented the actual use of language. In time, competence has become a cover-term for several different abilities:[a) *grammatical* competence - meaning 'tacit knowledge of grammar'; b) *conceptual* (lexical) competence - ability to use and understand the vocabulary of a language; c) *pragmatic* (communicative) competence - ability to communicate, to write texts, etc.' It is easy to see that members of a speech community may differ considerably in their lexical competence (in the number of words they can use appropriately), as well as in their pragmatic competence (e.g., ability to produce different text-types varies a great deal). Grammatical competence, in

contrast, is homogeneous across a given speech community: in what follows, 'competence' is understood as 'grammatical competence'.

The linguist's grammar is a hypothesis on the structure of the speaker's internalized grammar.

(29) More technically, a (linguist's) grammar is said to be a model of the speaker's competence, a model of the speaker's internalized grammar.

The term 'model' in (29) is understood as in the theory of modelling:

Definition of 'model' - A model is some object or phenomenon A, which is subject to investigation as a substitute for some other object or phenomenon B, with which A is in a relation of correspondence. Through the study of the model A, and through the established correspondence B-A, one obtains information about the (less accessible) object B.

The linguist's grammar is a model of competence in the sense that it attempts to outline the kind of knowledge the speaker possesses, which enables him to use language creatively. One thus reaches the conception of a grammar as a device capable of producing and interpreting any (therefore all) the (well-formed) sentences of a language.

b) The second empirical fact that generative theory calls attention to is the obvious truth that *grammars are learnable*. By the age of three, any normal child has already acquired his grammatical competence; he will have mastered the morpho-syntactic structures of his language; in later years, he will mostly enrich his language at the level of the vocabulary. The learnability of grammars indicates that *grammars are finite devices*. If they were not finite, given the properties of human organisms, they would not be learnable. A grammar G can only contain a finite number of rules. In conclusion:

(30) A grammar G of a language L is a finite set of rules which produces (and interprets) all and only the grammatical sentences of the language L.

Intuitively, what the (internalized) grammar does is to mediate between sound, (e.g., what one hears, alternatively what one produces) and meaning (e.g., what one understands, alternatively, what one wants to communicate).

(31)   Grammar — sound

             meaning
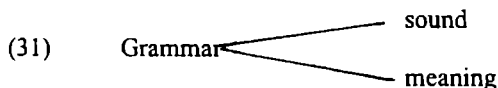
Each sentence must be associated with a semantic interpretation and with a phonological interpretation.We might assume that the linguist's grammar has a tripartite structure, as in (32).In this conception, syntax is responsible for "producing" the grammatical sentences of L; these sentence are assigned a semantic interpretation (a meaning) in the Semantic Component, and they are also given a phonological interpretation in the Phonological Component. The syntactic component occupies a central position, being 'generative', rather than 'interpretative'.

(32) The Syntactic Component ⟨ The Semantic Component / The Phonological Component
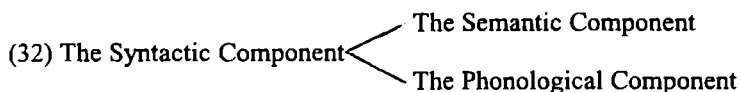
6.2. At this point, one should remember that syntax is poorly developed in classical structuralism; this is not accidental; the inductive taxonomic procedures do not easily lend themselves to syntactic analysis: To quote Chomsky [1973:14], "syntax is an infinite domain, and the inductive step that would lead to a description of syntax was plainly lacking".

It is easy to show that taxonomic procedures of directly segmenting and classifying the data were not sufficient to express certain types of syntactic dependencies and relations. In (33), one ought to be able to show that "whom" depends on the preposition *for*, which assigns it the oblique case.

(33) Whom did he say that he had done it for ?

More abstract and indirect representations appeared to be needed. "These procedures (i.e., the discovery procedures), says Chomsky, had insurmountable defects; they were wrong in principle. The right approach seemed to involve principles that were more abstract, more indirect. I slowly came to believe that it was necessary to assume general principles, a general abstract schematism, which, when confronted with the given data, would yield a grammar representing linguistic knowledge" [1973: 15].

The effort of remedying this methodological problem was one more reason that contributed to the reshaping of grammar.

6.2. The empirical and methodological problems mentioned above suggested the use of synthetic grammars, rather than analytical ones.

A relation of complementarity between structural and generative grammars is identifiable at this point: Structural grammars - are *analytic models* of language. The direction of analysis is from the (infinite) text to the (finite) invariant units and structures, and to the classification of those units. Generative grammars - start from an inventory of units (the lexicon) and a set of combiantory rules and aim at *producing the language*, the infintie text.

Structural grammars are mainly *paradigmatic*. In fact, de Saussure defined 'langue' as a system of paradigms. Syntagmatic relations are treated as auxilary tools for the discovery of the paradigms.Generative grammars are primarily *syntagmatic* - they offer rules for sentence construction and sentence interpretation. The sentence itself is a syntagmatic structure. Paradigms are assumed to be given.

6.3. In Chomskyan grammar, the explicitly assumed epistemological model is that of Galilean science; generative grammar avowedly counts as an attempt to get at the knowledge of language (= linguistic competence), "by making abstract models of the object, to which (at least) the linguists give a higher degree of reality than they accord to the ordinary world of sensations". Grammar may be described as a Galilean science, by noticing facts like a-c below.

a) Grammar offers a theory of language, a system of statements on language. Grammar proposes a system of hypotheses on the structure of the investigated language

(e.g., it shows which morpheme sequence are acceptaable, what sentence types the language possesses, etc.).

b) These hypotheses and rules (or, rather, these hypothetical rules of L) are formalized and formalizable. The formalism employed in the early stages of GG is that of mathematical logic.

c) These hypothetical rules that constitue a grammar make predictions as to what is grammatical / ungrammatical in language L; therefore, these hypotheses have testable consequences, and they can be falsified or refuted.

A rule of the form NP → Det^N, saying that any Noun Phrase (= NP) in English consists of an article followed by a noun, correctly predicts that: *These students learn hard. A student learns hard.* etc. are correct sentences in English. However, the rule is falsified by counterexamples like: *Syntax is tedious, Teachers are horrible.* The rule must be revised to show that the determiner is an optional constituent of the NP, i.e., NP → (Det) N.

Rules are revealing only if they have testable empirical consequences, i.e., if the rule "could go wrong". Linguistics is programmatically treated like a natural, empirical science.

6.5. *Linguistic Theory (LT) and Grammar (G).*The idea of constructing a grammar as a system of rules leads to the fundamental epistemologic problem of *justifying this* construction, of evaluating rival descriptions, selecting among them on a principled basis.This is why there is a need for a *linguistic theory.* The concept of linguistic theory (LT) is proposed by Chomsky in "Logical Structure of a Linguistic Theory" (= LSLT,1955, 1973).

Roughly, LT is an abstract theory which presents the basic principles and concepts of grammar, by means of which particular grammars can be written and evaluated.

The linguist will be concerned with three fundamental problems:a) constructing the grammar of a particular language; b) giving a general LT, of which each G is an exemplification;c) justifying and validating the results of this inquiry, that is, demonstrating that the grammar G that he has written is, in some sense, the correct one. These tasks are inter-related, LT cannot be arrived at inductively, by generalization over the grammars of several or all languages, because no grammar can be written without presupposing some concepts and principles.

There are several types of requirements that we might impose on the relation between LT, a language L and a grammar of L, G:

A very strong requirement would be that, given a language L and the linguistic theory, LT, LT should uniquely determine the grammar G. In that case, LT would be a *discovery procedure* for grammar. Given the existence of so many alternative descriptions of any better studied language, it appears that conceiving of LT as a discovery procedure is not feasible.

b) The closest strongest requirement would be that, given L, and a number of grammars of L, G_1, G_2,..., G_n, LT should uniquely select the best grammar G_i. In this case, LT would be said to offer a *decision procedure* for grammars. This requirement has also proved to be too strong.

c) A weaker requirement is that given a language L, and two grammars of it, G_i and G_j, LT should help one choose the better of the two grammars. We will say that in that case LT counts as an *evaluation* procedure for grammars.

Since LT offers an evaluation procedure for grammars, a reasonable question to ask is what are the criteria according to which grammars are evaluated. Two types of criteria are normally taken into account: There are first criteria of *external adequacy* or *descriptive adequacy*. A grammar is externally or descriptively adequate if it is "faithful to the data", that is, if it produces all and only the correct sentences of the language. A grammar that claims that the structure of the English NP is always Det +N, without specifying what kind of noun may follow the determines is descriptively inadequate since it may come up with examples like: *The Jane is here. *Some London is in England*. Secondly, there are criteria of *internal adequacy* or *explanatory adequacy*. This requirement simply means that a grammar should confirm to LT, it should obey the formal requirements stipulated there, it should meet conditions of simplicity, it should offer intuitively satisfactory explanations, etc.

Let us take an example of how two grammars G_1 and G_2 may be evaluated for explanatory adequacy. Suppose that G_1 and G_2 both generate sentence (34):

(34)   Women students are tempting new subjects.

Assume that G_1 works only with lexical categories (parts of speech): Noun (N), Verb (V), Adjective (A), Preposition (P), Copulative Verb (V cop), etc.

Assume that G_2 possesses not only lexical categories (N, V, A, P,...), but also the corresponding phrasal categories: NPs, VPs, APs, PPs, etc.

Sentence (34) is an example of constructional homonymy; the sentence has two unrelated readings: "Women students constitute tempting new subjects (say, for male sociologists)", and "Women students attempt to study new subjects". Since the homonymy is not lexical, but syntactic, an explanatory grammar should be able to assign this sentence two distinct readings on the basis of its syntactic properties. It should be obvious that G_1 cannot handle this example. The most it can do is to label the constituents as to their parts of speech.

(35)   Women   students   are   tempting   new   subjects.
          N   N   V   Ving   A   N

The second grammar, G_2 can account for the syntactic homonymy, by assigning it two distinct syntactic interpretations. What counts is how the elementary constituents fall into phrases. Two such groupings are allowed, as shown below:

(36)

Thus, the participle *tempting,* is either part of the Present Continuous of the verb, or it is interpreted as a modifier inside the NP *tempting new subjects.*We conclude that

G_2 has better explanatory power than G_1. The example also suggests why phrases are needed in syntactic analysis (see next chapter on this).

6.5. *The structure of the linguistic level.* A language L is an enormously complex system. LT attempts to reduce this complexity to manageable propositions, by the construction of linguistic levels of representation; each such representation characterizes some properties of the analysed utterance. A grammar reconstructs the total complexity of a language stepwise, separating out the contribution of each linguistic level.

> (37) A linguistic level L is a system in which one construct a unidimensional representation of an utterance. Representations may be phonological, morphologic, syntactic or semantic.

LT indicates the general form of a linguistic level; providing the general format for linguistic analysis:

a) A level L has a certain fixed (and finite) set of *elementary objects*, called its *primes*; for instance, the distinctive feature in phonology, the morphemic segment on the morphemic level, the set of parts of speech (lexical categories, N, V, A,...) and phrases (grammatical categories) in syntax, a.s.o.

b) On each level, there are *operations* which show how to construct more complex objects out of the elementary objects of the level. On some levels (e.g., the phonemic one, the morphemic one the phrase structure one), there is only one operation; that of concatenation. Concatenation is the elementary operations which, given any two elements X and Y, allows the formation of the complex object X Y or Y X. The simple or complex elements of L are called *strings*. As mentioned, some of the linguistic levels are simply concatenation algebras.

c) Within each level, it is possible to define certain *relations* between some elements and (other) classes of elements. An example could be the "is a" relation, used in categorial analysis, as when saying that the string "the boy" is an "NP", etc.

d) On each level, every utterance must be assigned an *L-marker*. The L-marker of a given utterance U must contain within it all the information as to the structure of U on level L. In the case of most levels, markers are strings. On the phonemic level, for example, each utterance U will be represented as a string of phonemes, while on the morphemic level, the same utterance will appear as a string of phonemes.

> (38) a. Every dog barked.
> b. e^v ^r^i·d^ɔg^b^a:·^k^t   phonemic representation
> c. evri^dɔ g^ba: k^id   morphemic representation
> (the Past Tense is represented as *id* [ed], cf. Miner (1975)).

e) For each level, one must specify its relation to other levels; therefore, *mappings of the representations on that level onto representations of the higher and lower levels must also be provided.* For instance, in mapping the morphemic on the

phonemic representation of (38a), morphophonemic rules will select /t/ as the correct allomorph of /id/ in the phonemic context of the voiceless consonant/k/. One mapping of particular importance relates the representations on one given level to the actual sentence (the so-called terminal string).

LT appears to have a double role: it serves in the writing of individual grammars, having a descriptive function; but it also serves in the evaluation of the constructed grammar, in comparing alternative grammars; therefore, LT has a meta descriptive function as well.

LT is in fact a Universal Grammar (=UG) in an epistemological acceptation of this term, that is, a framework of concepts and formal structures that must be assumed in any linguistic research, in any discourse on language.

In fact, the term Universal Grammar is currently used in generative theorizing to replace the earlier "Linguistic Theory": in earlier work, Chomsky had probably avoided it because of its rationalistic connotations. (see Chomsky (1973))

| Since grammar formalized the native speaker's intuitions, his competence, the proposed model of the linguist is no longer that of the field worker armed with nothing but a tape recorder (or a native informant), but rather the linguist analysing his own language in his own study and bringing to bear his judgment, alongside of any knowledge he may get on his language, by whatsoever means (corpus analysis, psycholinguistic experiments, questionnaires, etc)

In LSLT Chomsky underlies that the position of the linguist writing a grammar is somewhat similar to that of a child learning his native language.Both the child and the linguist are confronted with external data in the given language.

The lingist attempts to formulate the "rules" of the language, the child, as part of the natural process of growth, will ultimately construct a mental representation of the grammar of his language.

In his efforts, the linguist is "helped along" by the formal framework offered by UG. A legitimate question to ask is whether there is anything that the child relies on, in learning his language and constructing a mental representation of the grammar of his language. In other words, is there any psycholinguistic counterpart of the linguist's Universal Grammar, in the same way that the speaker's competence, his internalized grammar is the psychologic counterpart of the linguist's grammar.

Chomsky's strong claim is that the psychological counterpart of UG is the child's *language faculty, which is itself a kind of universal grammar*, a component of the child's mind, *part of his genetic endowment*. The child's mind is not, Chomsky believes, a "blank slate" when the child is born, learning cannot simply proceed by analogy, induction and generalization.

Chomsky radically departs from empirical theories of learning, boldly espousing the view that *the learning of a complex system like language would be impossible in the absence of some well-structured innate mental mechanism*, which makes possible the interpretation and selection of the data, in the process of language acquisition. The child is thus innately equipped with a universal grammar.

Chomsky's most powerful argument is the argument from "the poverty of stimulus" (cf. Wexler (1992)). The argument starts by noticing that the mastered linguistic system is of great complexity. Consider the pairs of questions below.

(39)   a. Who do you believe - came ?
          b. *Who do you believe that - came ?
(40)   a. Who do you believe that Peter saw -.?
          b. *Who do you believe the report that Peter saw - ?

Examples in the first set are perfectly synonymous, yet there is a sharp contrast of grammaticality between them. The same is true about the second pair. It is extremely unlikely that such grammaticality judgments, mirroring "rules" of the language can be arrived at by induction over the data. What kind of examples should one generalize over? Moreover, there is no explicit instruction given the child to prevent the occurrence of examples like (39b) and (40b), and such errors occur seldom if ever. "Rules" like those implicit in (39), (40) cannot be learned on the basis of such an 'impoverished stimulus'. Given the 'poverty of stimulus' and the complexity of knowledge attained, a reasonable hypothesis to entertain is that the child is innately equipped with the mental analogue of a UG.

The concept of Universal Grammar can be understood in two ways:

a) *an epistemological interpretation* - Universal Grammar - is a structural core for the generation of linguistic theories and grammars;

b)*an ontological interpretation*- UG is the language faculty the child is born with.

A very articulate view of the relation between language / grammar / mind is found in Chomsky (1986a), where a new distinction between *Externalized language* (=E-lg) and *Internalized language* (=I-lg) is proposed. *E-lg* is language conceived as outside of conscience,'a construct understood independently of the properties of the mind/brain.'(op.cit.:20). Definitions of language as 'the totality of utterances that can be made in a speech community (cf.Bloomfield (1933), or the Saussurean view of language as a system of sound with an associated system of concepts, as well as behaviouristic-sociolinguistic definitions of language as a social institution, as a set of normative practices or games, all illustrate the concept of E-lg. In this tradition, E-lg is assumed to be the real object of study for the linguist; grammar is a derivative notion, a collection of descriptive statements, or, more technically, a function that enumerates the elements of E-lg.

In contrast, I-lg is defined as the 'system of knowledge attained and internally represented in the mind/brain. The similarit(or identity) with the earlier concept of 'competence'(=tacit knowledge of the language) is unmistakable, but I-lg is now part of a better defined conceptual fabric. From the point of view of the duality mind/brain, I-lg is the content of the so-called language Steady State S_s , attained by the language faculty in an adult speaker, through a process of maturation. The language state S_s is a

relatively steady state, which may undergo only minor, peripheral modifications (e.g. the acquisition or loss of certain lexical concepts). The system of linguistic knowledge represented by I-lg was constructed on the basis of the speaker's / child's linguistic experience, starting from the initial state S_0 of the language faculty. 'UG is construed as the theory of human I-lg, a system of conditions deriving from the human biological endowmenr that identifies the I-lgs that are humanly accessible under normal conditions (op.cit:24).' We have the following conceptual array:

(41) S_s I-lg   Grammar
      (as content of S_s)   (as theory of I-lg)
      S_0 UG   the linguist's UG
      (as content of S_0)   (as theory of the content of S_0)

The intepretation of schema (41) reveals important relations between the concepts involved. Of considerable interest is the relation between I-lg and E-lg. First, E-lg is the factor of the natural world which *triggers the development of I-lg* through the subject's being exposed to the linguistic data. Since, according to Chomsky, the grammar is a model of I-lg , linguistic investigation turns away from the study of E language to the stydy of I-language, 'the focus shifts from the study of the language regarded as an externalized object to the study of the system of knowledge attained and represented in the mind/brain' Accepting the surely correct view that knowledge of an (E-)language is knowledge of its grammar, we may say that I-language (modelled by the grammar) is the manner in which a-language is constituted in the subject. The linguist's grammar is a hyposthsis on the content of the speaker's internalized lamguage. At the same time, linguistic experience is possible, i.e., the human subject may process the linguistic signal and may develop a grammar, precisely because he is genetically endowed with UG. It is also worth emphasizing that I-lg can objectify itself and *transcend human conscience* only in, and as, E-lg. E-lg is the transcendent form of language. At the same time, perhaps against Chomsky himself, we should stress that E-lg holds a certain *cognitive priority*, at least in the sense that language acquisition is directed towards E-lg, and that subjects are aware of E-lg, not I-lg (the content of the latter is, presumably, accessible through reflection). Finally, schema (41) also shows Chomsky's realist position: it is claimed (in 41) that the principles of UG and I-lg are represented in the mind/brain, in the states S_0 and S_s of the language faculty. It is hoped that the progress of cibernetic studies will, in time, provide more adequate information on the stats S_s and S_0, leading to a correct identification of those representations of UG and I-lg with those of S_s, and S_0, respectively. The interpretation of these representations 'would constitute a cerebreal hermeneutics, whose content would be identical or at least equivalent with the content of the principles of UG and I-lg.

Turning to strictly linguistic matters, the empirical constraint of learnability, alongside of the problem of theory underdetermination by the data, has greatly

influenced at least two aspects of linguistic research: the evidence considered and the type of formalism used. The type of evidence considered includes not only intuitive judgments of grammaticality (still holding a priviliged position), but any linguistic or psycholinguistic relvant data such as: data from psycholinguistic experiments, frequency counts, language change, literary usage; consideration of cross- linguistic evidence is alsoa common practice, etc. The consideration of an enriched set of data elimnates descriptively poor analyses, and helps making decisions between alternative courses of an anlysis. As to the formalism of the grammar, it should meet conflicting requirements: On the one hand it must be rich enough to comprehend the attested variety of languages. On the other hand, these devices must be restrictive, 'meagre' enough to guarantee that very few 'languages'(grammars) can be constructed by the learner on the basis of the data. If a vast number of grammars were available, the language would be unlearnable. This tension, between flexibility or richness, and rigour of the formalism has lead, as will be seen, to the reshaping of the formal structure of generative grammar, reaching the current stage of parametric grammar. The formalism has developed by eliminating those formal devices which were too powerful. (e.g. transformations).

Although Chomsky's ideas on language, grammar and mind have considerable appeal among psychologists, philosophers, and linguists, there is still a great deal of controversy surrounding Chomsky's ideas regarding the psychological reality of grammar and universal grammar (see Kasher (1991), George (1989)).

For the narrowly linguistic concerns of this work, it is enough to accept the epistemological interpretation of UG; in fact, every serious practicing linguist does this.At the same time we will consider relevant in writing or evaluating an analysis any kind of evidence that comes from theories of learning, etc.

Chapter 2

THE NOTION OF CONSTITUENCY
PHRASE STRUCTURE GRAMMAR

1. Sentence constituency. 'String' versus 'Constituent'.

It is an important property of sentences that they are not unstructured sequences of words. In fact, as shown in the analysis of sentence (1)((=34) in the preceding chapter), the words in a sentence fall into significant sequences:

(1)   Women students are tempting now subjects.

Sentences are hierarchically-structured strings of words. The sentence has an architectonic structure, which is the *constituent structure* of the sentence. What has been said so far relies on a tacit distinction between *'string'* and *...constituent'*. These two notions are defined as follows.

(2)   A <u>string</u> is defined as any sequence of two or more than two adjacent elements.
(3)   A <u>constituent</u> is a string which has formal properties, i.e., which has *internal cohesion*.

In sentence (1), *women, women students, women students are, students are, students are tempting new*, are tempting new subjects, etc. are all strings, but only *women, women students* and *are tempting new subjects* are constituents (for reasons presented below).

(Sentence) constituency is the central concept of syntax. It is the Grammar's task to assign an analysis to any sentence, that is, to exhibit its proper constituent structure. To show the constituency of a sentence, one must indicate : a) what strings (of the analyzed sentence) are constituents; b) what kind of constituent each one is, i.e., to what category each constituent belongs. The constituency of a sentence is indicated on the phrase structure (PS) level of representation, a syntactic level of the Grammar.

2. The phrase structure level of the grammar

We will present the phrase-structure level, following the general organization of any linguistic level, described in the previous chapter.

The *primitives* of the level are the symbols employed in the rules of the phrase structure level. The totality of the symbols make up the *vocabulary* of the Grammar.

Symbols designate rather well-known classes of units of traditional and structural grammars.

"The *vocabulary* contains *categories, formatives* and *features.* ` *!*

"a) Categories are subdivided into *grammatical* and *lexical* categories.

Grammatical categories correspond to *phrases* or units larger than phrases, while *lexical categories* correspond to parts of speech, or distributional classes.

The following are examples of grammatical categories:

- S (sentence)-it is the initial symbol of the grammar, which is a sentence grammar).

- NP (noun phrase)-a phrase whose only obligatory element is a noun: *a boy, birds.*

- VP (verb phrase) - a phrase whose main obligatory constituent is a verb: e.g., *running away, to give it to Mary.*

- AP (adjectival phrase) - a phrase whose only obligatory element is an adjective: *very smart, fond of music, larger than him.*

- PP (prepositional phrase): *on the desk, for me.*

- AvP (adverb phrase)-a phrase whose only obligatory constituent is an adverb: *fairly well, rapidly.*

Lexical categories (parts of speech) are so-called because their members are listed in the *lexicon:* Ns (nouns), Vs (verbs), As (adjectives), Avs(adverbs), Ps (prepositions) Dets (Determiners).

Categories are defined only through the way they function in the rules (i.e., strictly formally).

b) *Formatives* are minimal (terminal) elements which have syntactic function. Like categories, formatives are *lexical* and *grammatical.*

Lexical formatives include lexical items listed in the lexicon as belonging to different parts of speech: boy_N, run_V, for_P, etc.

Grammatical formatives - are items individually mentioned in certain rules of the Grammar, they are "grammatical words": e.g., *by* introducing the Agent of a passive construction (*It was broken by Bill*), *there* as a formal subject (*There is no one here*), etc.

c) *Features* express properties of lexical categories, they may be phonologic, semantic [e.g.,[±Person], distinguishing *who / which*] or syntactic. With respect to a phrase structure grammar, a feature is syntactic if and only if it refers to a distributional context. For instance, the syntactic feature [± Det --] differentiates nouns that take determiners (*the table, a boy*) from nouns which do not take determiners (e.g., *John*). The distinction between categories and features should be viewed as relying on the opposition between the *formative function* of the categories which figure in phrase structure rules, and the *characterization* function realized by the features, with respect to (already) given items of the language.

3. On constituents and constituency.

The operation that builds more complex objects of the level out of the elementary ones is *concatenation,* i.e., given two object x, y, one can build either the

object x y, or the object y x. *The rules* of the level are called *phrase structure rules* (PSRs): as shown by their name, they indicate the structure of phrases, or the *constituency of phrases*; e.g., the rule S →NP VP says that any sentence in English *(It is raining, John saw Mary*, etc) contains one NP and one VP, in that order; therefore, strings like **of^the, *was raining it*, etc. are not sentences in English.

. In setting up PSRs, the linguist relies on the *formal properties of constituents*. There are tests and well-known empirical facts which can be used to determine the constituency of a sentence. While intuitively, words are independent units, therefore, they are constituents, it is less obvious that syntagms are constituents. In the presentation of constituency tests,reference is chiefly made to phrases.

3.1. Distributional facts. The prime reason for referring to constituents in the description of a language is that such reference makes it possible to state generalizations about sentence patterns.

We observe, for instance, that in English the distribution of proper names and plural nouns is roughly the same, and that this distribution is shared (roughly) by many other sequences of words: Det + N, A + N, Det + A + N, Det + A + N + P + Det + N, Det + N + S, etc.

(4)	NP	'	VP
	John		
	Boys		
	This boy		
	Lazy boys		can be nice
	The lazy boy		
	The lazy boy in the armchair		
	The boy who has arrived		

(5)	P	NP
	with	John
		boys
		this boy
		lazy boys
		the lazy boy
		the lazy boys in the armchair
		the boy who has arrived

Since all these sequences have the same distribution, occurring before a VP and after a preposition, they may be assumed to have something in common; they may be supposed to instantiate the same category, a category, which, as shown by the survey of the examples, has a Noun as its only obligatory constituent; this category is the NP.

Given that examples in (4) are all sentences, we may propose the following rule for sentence structure: S →NP^VP.

3.2. Coordination. The distribution of *and / or* offers another criterion for constituency. *And / or* link only constituents, moreover, (normally) only constituents of the same kind (e.g., two NPs, two APs, etc.)

Generally, if both strings X and Y occur in some context Z_1 -- Z_2 (i.e., we have both of the strings $Z_1 \frown X \frown Z_2$, $Z_1 \frown Y \frown Z_2$), we can determine whether they occur as constituents, by testing whether the sequence 'X and Y' also occurs in this context (i.e., whether we also have the string '$Z_1 \frown X \frown$ and $\frown Y \frown Z_2$'). Application of this test may show, for example, that the strings *men can* and *women will* do not occur as constituents in the context *Few American ------play rugby* in (6a),since (6b) is ungrammatical:

(6)   a.Few American <u>men can</u> play rugby, and few American <u>women will</u> play rugby.
        b.*Few American <u>men can</u> and<u> women will</u> play rugby.

Applying the same test, in (7), we may conclude that X and Y occur as constituents in the context *The men --when we called them*, moreover, they are VP constituents.

(7)   a. The men <u>went out of the house</u> when we called them.
        b. The men <u>got into their cars</u> when we called them.
        c. The men <u>went out of the house</u> and <u>got into their cars</u> when we called them.

Consider now the data in (8) and (9).

(8)   a. John likes pretty girls.
        b. John admires pretty girls.
        c. John likes and admires pretty girls.

(9)   a. John enjoyed the play.
        b. John enjoyed the English performance.
        c. John enjoyed the play and the English performance.

Therefore, within the VP, both the V (*admires, likes*) and the NP (*the play, the English performance)* occur as constituents. On the basis of data in (8) and (9), the VP may be assigned the following structure: VP →V$\frown$NP.

3.3. Thirdly, there are conditions on <u>the location of certain morphemes</u>, which are impossible to state except by reference to constituents. An example is the Genitive marker -'*s,* in English, which has to be located at the end of a *Noun Phrase*, not at the end of a *Noun* (hence (10 c, e) are ungrammatical, while (10 b, d) are correct.).

(10)   a. Germany's defense
          b. [The Queen of England]'s hat
          c. *the Queen's of England hat
          d. the woman I talked to's arguments.
          e. *the woman's I talked to arguments.

3.4. Anaphoric elements. Another relevant class of distributional facts regards *pronouns* and, generally, *anaphorical substitutes*. The generalization is that languages have substitutes only for strings which are constituents. Thus, a language may have a pro - NP morpheme [= a pronoun], a pro - S morpheme, a pro - nominal morpheme, etc.:

(11)   a.[<u>The boy who entered</u>]$_{NP}$ is tall.   <u>He</u> = pro - NP
              <u>He</u> is tall.
          b. Give me this [<u>coat</u>]$_N$ and keep that <u>one</u>. <u>one</u> = pro-nominal
          c. I believe [<u>that Bill is nice</u>]$_S$, and you believe <u>so</u> too.
                                     <u>so</u> = pro-sentence

Thus, in (11), *he* replaces an NP, *one* replaces a noun, *so* replaces a sentence; all of the substituted strings are constituents. Consider now (12).

(12)   Take this *blue coat* and keep that *one.*

In (12) *one* stands for *blue coat*, indicating that *blue coat* is a constituent, moreover, the same kind of constituent as *coat*, that is, a nominal constituent of the form (13); (13) may be viewed as one more phrase structure rule.

(13)   N →(AP)⌢N

Morover, one can predict that no language will have a substitute for the sequence N + modal verb. [eg., *men can, women will* in (6)], since this sequence is not a constituent:in the striing: Det⌢A⁻[N⌢Modal Verb] ⌣Verb⁻NP.
    3.5. Strings which can be moved, deleted etc. are constituents. The operations of the Grammar always apply to constituents:

(14)   a. It is tough to understand [that sort of viciousness] .
          b. [That sort of viciousness]$_{NP}$ is tough to understand.

3.6. Semantic considerations also support constituency. Constituents tend to be significant sequences, semantic (not only formal) units. As an illustration, we will examine idioms. It is known that *idioms* are special in that their meaning is assigned

non-compositionally; it does not represent the sum of the meanings of the constituent parts. Rather, the meaning of the whole idiom must be learned as a block. What is significant for this discussion is that, formally, idioms, as well as expressions that have figurative meaning, are always *constituents*, and can be identified as phrases of a particular type. Figurative meanings, therefore, develop at constituent level. Here are examples.

(15)　NP idioms:　　a fat chance, etc.
　　　　　VP idioms:　　give up one's Ghost, trip the light fantastic, etc.
　　　　　spill the beans, kick the bucket, etc.
　　　　　PP idioms:　　at first blush, at long last, by the bye, by a long chalk, by the skin of one's teeth, etc.
　　　　　AvP idioms:　　every so often, once in a blue moon, etc.
　　　　　S idioms:　　　The cat is out of the bag. / The gig is up, etc.

3.7. Prosodic features also help to determine constituency. Closely linked to the tendency towards semantic unity of constituents is their prosodic unity. Sentences must be assignable patterns of prosodic features, in particular, intonation. Moreover, the pattern associated with whole sentences must be related to the pattern associated to their parts, in a way which is at least partially systematic, as is accepted by all approaches to stress and tintonation. From the hierarchical structure of sentences and the prosodic unity of combinations at several levels in such structure, it follows that elements combined at the 'inner' or 'lower' levels will be more tightly bound to one another, than those combined at upper levels. Hence, there will be differences of *interruptability*. Thus, it has been noticed that parenthetical elements, etc., tend to occur at major constituent breaks, i.e., at the end of phrases. Compare:

(16)　He ran, as I remember it, [down the street.]$_{PP}$
　　　*He ran [down, as I remember it, the street.]$_{PP}$

Conclusion. The evidence presented establishes the fact that English sentences exhibit phrase structure. It is customary to indicate the hierarchical organization of a phrase by means of *brackets*, labeling them to indicate the category of the constituent. Such a representation is called a *labelled bracketing*.

(17)　$_S[_{NP}[[_N John]]_{NP} [_{VP}[talked]_V [_{PP}[_P about] [_{NP}[_{Det}the] [play]_N]_{NP}]_{PP}]_{VP}]_S$

Two conventions limit the possibilities for breaking up a string into phrases:
　　a) No word (element) may belong to two different constituents at one time. Moreover, in breaking up a string into phrases, every symbol is a member of some

phrase, even if that phrase contains that symbol alone. Thus, *John* is an NP, not only an N in [[[John]$_N$]$_{NP}$ [ran away]$_{VP}$]$_S$.

b) Only a sequence of *adjacent symbols* may constitute a phrase. Thus a b c cannot be parsed into a - c, and b. Discontinuous constituents are disallowed.

4. Phrase structure rules (PSRs). Let us return to the description of the *phrase structure level* of the grammar. So far, it has been shown that the phrase structure level operates with categories, a lexicon and phrase structure rules. Using PSRs, a PS grammar may generate sentences to which it assigns a certain *constituent structure* (a certain analysis). The following rules have generally been proposed in PS grammars of English.

(18) a. S →NP⌒VP
        NP → (Det)⌒N
        VP → V⌒NP
        VP → V
        VP →V⌒ PP   VP → V⌒(NP)⌒(PP)
        VP --> V⌒NP⌒PP
        N →AP⌒N
        PP → P⌒NP
      b. N → John
        V →run, read, rely, give
        P → about
        A →blue
        Det→the, a

Remark that the rule VP→V⌒(NP)⌒(PP) generalizes over all the proposed VP expansions, which represent particular instances of it. Here are some more important *properties of PSRs.*

1) PSRs specify the obligatory and optional constituents of phrases; they exhibit the constituent structure of phrases.

2) They are "rewriting rules"; they replace the category they analyze by its constituents, which are concatenated (this is shown by the arc " ⌒ " notation) and ordered. Thus, rule (18a) is an instruction to "rewrite" or replace the categorial symbol S, by the sequence of categories NP VP.

3) PSRs are *context-free* rules, that is, for some PSR, A→Z, the rewriting of A as Z does not depend on the context of occurrence of A.

4) PSRs are unordered. Categories may be rewritten at any moment when they occur in the analysis of a sentence. However, *not more than one category is analyzed at one time.*

5) PSRs provide *decision procedures* for strings; i.e., they select, out of the totality of strings built from elements of the lexicon, those strings which are constituents of a certain kind, e.g., *the tall, *men will are not constituents, while "*the boy*" is an NP, and "*tall boy*" is an N.

6) The PS level is thus based on a relation of "representation". The category NP, may be represented by Det⌢N, and ultimately by *the⌢boy, a⌢man, these⌢girls*. Notating this representation relation with R, the examples above are R (NP, Det⌢N), Ṛ (NP, the⌢boy), R(NP, a⌢man), R(NP, these⌢girls). Conversely, it appears that each of these strings is classified as an NP. Therefore, the relation of representation is essential in categorial analysis. This can be expressed as in (19):

(19)   R (NP, the girl) iff the girl is an NP

7) The arrow →is reminiscent of the material implication sign (→); in formal logic, 'p → q' means 'if p, then q'. In fact, even in PSRs, the sign may be read as a material implication sign. A rule like 'S →NP⌢VP' means that if S is any sentence, then it will be constituted of an NP and a VP. A PS Grammar may be viewed as a logical calculus.

5. Derivations.

A derivation is a sequence of strings of symbols, each of which is formed from the preceding by applying some rule of the grammar. Derivations start with the initial symbols. The ordering of rules plays no role; therefore, there will be different equivalent derivations of the same sentence.

(20)

S				S			
1 NP	VP			1' NP	VP		
2 N	VP			2' NP	V	NP	
3 N	V	NP		3' NP	V	Det	N
4 N	V	Det	N	4' N	V	Det	N
5 John	V	Det	N	5' N	V	Dct	monkey
6 John	was kissing	Det	N	6' N	V	the	monkey
7 John	was kissing	the	N	7' N	was kissing	the	monkey
8 John	was kissing	the	monkey	8' John	was kissing	the	monkey

Each of the strings in the derivation represents the sentence under analysis in a way which is relevant for the formal properties and the meaning of the sentence. Inspection of the derivation may show whether a given string is a constituent and what type of constituent it is. To know whether a given occurrence of a string X is a constituent of type Y in some (larger) string Z, it is necessary to check among the representing string of Z; suppose, one finds among these both $Z = W \frown X \frown W$ and $Z' = W \frown Y \frown W$ (where Z' represents Z). In this case we say that, with reference to analysis Z', X is a constituent of type Y in Z. Consider as examples the representing strings (2') and (6') of the sentence *John was kissing the monkey* in (20).

(21) $Z(=2')$ NP$\frown$ V$\frown$NP
        $Z'(=6')$ N'$\frown$ V$\frown$ the$\frown$monkey.

With respect to analysis (2') of (6'), the string *the monkey* occurs as constituent, moreover, as an NP constituent. On the other hand, the string *'was kissing the'* is not a constituent with respect to *any* analysis in (20). The fundamental notion is thus the "is a" relation, the relation which checks for constituency and assigns constituents to categories. But this relation must be relativized to particular occurrences of strings in sentences. Thus, *reading books* is an NP constituent in *Reading books is a pleasure,* but not in *He was reading books on agriculture.*

6. Phrase markers.

The L-marker of the phrase structure level is, expectedly, called a *phrase marker* (PM) or derivational tree; it is assumed to contain every syntactically relevant information on some given utterance. All the equivalent derivations (like 1-8, 1'-8') of some sentence S may be "collapsed" (i.e., represented) as the same *phrase-marker.*

(22)

```
                    S
          NP                    VP
          N           V                NP
          John    was kissing     Det        N
                                   the       monkey
```
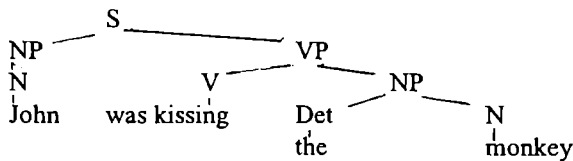
Various important notions may be stated in terms of tree geometry:
1) The point from which lines branch is called a *node.* A node may branch into any number of lines including one. At present, the tendency is to allow only binary branching, if feasible. The branching node is the *mother node*; nodes branching from the same mother node are *sister nodes* (e.g., the nodes Det, N are sister nodes under the mother node NP).

2) The node S dominates everything else in the tree, but it *immediately dominates* only the "daughter"nodes NP VP; generally A immediately dominates B, if A is higher than B in the tree, and there is no intervening node C between A and B.

3) A subtree dominated by a single word is a *constituent*. The label of a node shows the syntactic category of the consituent.

7. The representation of syntactic functions in phrase markers.

Phrase markers provide categorial and functional information. Categorial information is the basic kind of informations supplied by PMs. PMs provide an analysis of sentences into constituents. The essential information is that of being a consituent of a certain type (e.g., in PM (21), the strings *John, the monkey* are both *NP-consituents*). The essential relation between constituents and the categories that identify them is *dominance* (a hierarchical relation). The PM also gives a formal representation to the linear left-to-right, relationships between the elements, called *precedence* relations.

Functional information is also represented in the PM. In marking the distinction between *functional* notions, like Subject (Su), Direct Object (=DO), Indirect Object (IO), and categorial notions like NP, AP, etc., one should insist on the inherently *relational* character of functional notions. A string like *the tall boy* will be characterized as an NP in any context, and also outside any context, in virtue of its structure and properties but depending on its use, it may be the *Subject-of* a sentence (23 a), the Direct-Object of a Verb, (23b) etc:

(23)   a. That tall boy is my brother.
          b. I admire that clever boy.

In other words, functions depend for identification on the context of some sentence. Given the PSRs and Pms presented above, the subject may be defined as any NP dominated by S; any VP dominated by S functions as a Predicate of the sentence, any NP directly dominated by VP is a Direct Object, etc. Such definitions show the relational character of syntactic functions, differing from the inherent character of categorial notions.

(24)   Subject-of [NP, S]
          Direct-Object-of [NP, VP]
          Predicate of [VP, S]

7.1. Phrase Structure Grammar. - What we called the PS level is, in fact, a PS grammar - a finite set of rules which operate on categories and the lexicon and generate a language,that is, an *infinite* set of sentences.

Since PSRs are context-free, PS Grammars are context-free grammars and generate *context-free languages*.

PS Grammars may contain *recursive* rule. A non-terminal symbol (S, NP, etc.) is recursive if it may dominate a subtree that contains it (see configurations (25 a - c) and examples (26)).

(25) a.   b.

```
         S                          S
   NP         VP            NP          VP
NP      S                 V       S
```

c.

```
        S
S            S
    Conj        S
```
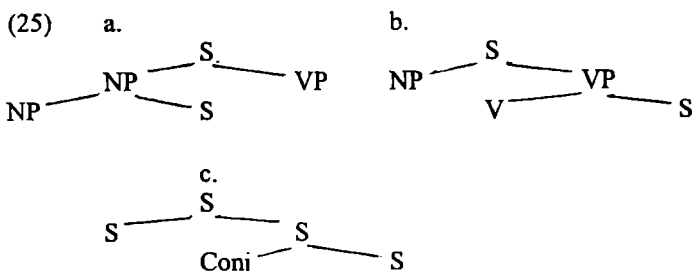
(26)   a. [John, [who knows English]$_S$]$_{NP}$, translated for us.
       b. [John [$_V$ believes [that Chomsky is smart]$_S$]$_{VP}$]]$_S$
       c. [Prince Charming entered]$_S$,[and [all the girls fainted]$_S$].

Since S is itself a recursive symbol, a PSG will generate sentences of great complexity.

8. Immediate constituent grammars -

Like almost all important operational concepts, the concept of *constituent* is due to structuralist theory. We owe it to Bloomfield (1933: 161): "The form *'Poor John is running away'* contains seven morphemes: *poor, John, is, run, -ing,* a- *way*. However, the structure of complex forms is by no means as simple as that; we could not understand the forms of a language if we merely reduced all the complex forms to their ultimate constituents. Any English speaking person who concerns himself with that matter is sure to tell us that the *immediate constituents* of *Poor John is running away* are the two forms *poor John* and *is running away,* that each of these is, in turn, a complex form; that the immediate constituents of *is running away* are *is running,* a complex form, whose constituents are *is* and *running,* which, in turn, is a complex form containing *run* and *ing,* and *away*; and that the constituents of *poor John* are the morphemes *poor* and *John*. Only in this way will a proper analysis (that is, one which takes account of the meanings) lead to the ultimately constituent morphemes". (Other clear expositions of the IC method are found in Rulon Wells (1947)" Immediate Constituents) and Hockett (1954) "Two Models of Grammatical Description) and (1958)" A Course in Modern linguistics"; an application to the domain of English is Nida (1952), "English Syntax").

Bloomfield establishes here the procedure of analysis into I(mmediate) C(onstituents). IC is a technique of breaking up complex forms into successive components. The analysis takes us from *sentence* to *morpheme,* viewed as "the minimal sequence that has both a constant form and a constant meaning". The analysis proceeds

in binary steps, identifying *immediate constituents*, down to the level of the ultimate constituents, which are *morphemes*.

The assumptions of the analysis are as follows:

1) A linguistic form is either simple or complex.

2) A simple form is a morpheme.

3) A composite form consists of two or more Immediate Constituents standing in a *construction*. Each IC occupies a certain position in the construction and each is the partner of the other. A construction is completely specified when we have defined the categories (form classes) that can occupy the two positions in the construction. IC - Grammar is an analytical grammar, which aims at establishing the following fact about an analysed language:

1) a list of *the constructions* of the language

2) for each construction, one specifies *the positions* of the construction, as well as what forms (morphemes or complex forms) may occupy these positions;

3) a list of the simple forms [morphemes] classified as to their occurrence in *distributional classes* (some of these are the traditional part of speech).

The constructions were classified as *exocentric* and *endocentric*. A construction is endocentric when the distribution of the construction is the same as the distribution of one member - the head of the construction. Endocentric constructions may be based on a relation of *coordination or of subordination*. Subordinative endocentric constructions have the same distribution as their head. Here are examples:

(27) a. *modifier + head constructions*
a + tree
John's + desk
stone + wall
ice + cold

b. *head + modifier*
book + on the table above
run + slowly
remark + above

Coordinative endocentric constructions have the distribution of either member of the coordination:

(28) John and Mary
hot and cold
come and go

Exocentric constructions are those which are not endocentric (i.e., their distribution does not equal the distribution of either member). Here are examples:

(29) a. *Prep+ Noun Phrase*
in + the box
down + the road

b. *Conjunction* + *clause*
if + he does not come tonight
while + we were there

(30)   *V copulative* + *Predicative*
is + a big man
became + excited
lay + motionless

(31)   *topic* + *comment*
Domingo + is a giant.
Beans, + I don't like.

IC analysis works both within the word and beyond the word; there is no principled difference between morphology (word structure) and syntax (sentence structure). Thus the words in (32) can be analyzed as endocentric constructions:

(32)   a.   [black + bird]
                        [riding + master]
        b.   [un + happy]
        c.   [un + [lady + like]]

There is a fluid passage between morphematic and syntagmatic analysis, since the same constructions obtain inside the words and between words:

(33)   [a. + [[[real+ly] + [im+polite]]+ person]]

9. The insufficiency of phrase structure grammars.

It was, however, noticed that one cannot show the proper constituency of certain constructions if the analysis is limited to the data explicitly present in the signal, to the utterances as such. There are several types of constructions which are not properly analysed into constituents in a PS Grammare; here are a few examples.

9.1. Discontinuous constituents. The elements of a constituent are supposed to be adjacent (see above), but this is not always the case. Elements which can be shown to belong together by formal tests may appear at a distance, giving rise to a *discontinuous constituent.*

(34)   a. ? What do you always take your shoes off for in my class ?
        b. Why do you always take your shoes off in my class ?
        c. Why do you always remove your shoes in my class ?

In (34 a), *what ... for* make up a discontinuous constituent which can be substituted by *why* (34 b), and *take ... off* make up a discontinuous constituent which can be replaced by *remove (34* c).

The point is that the Grammar should contain a level of representation where the the discontinuous components, may be represented as one ("continuous") constituent.

A famous example of discontinuous constituent is offered by the Auxiliary [Aux] in English: The Aux is that constituent which includes the elements of tense, modality and aspect of a sentence (be they affixes or auxiliary verbs). The English Aux

Chapter 3

TRANSFORMATIONS.

The Structure of the Transformational Level

1. The concept of transformation

Loosely speaking, transformations express relations between certain classes of sentences in a language. For example, sentence pairs of type (1) are related by means of the Passive Transformation, sentence pairs of type (2) are related by Subject - Aux Inversion, a.s.o.

(1)   a. Possibly, the horse has thrown Dick off.
        b. Possibly, Dick has been thrown off by the horse.
(2)   a. Pete is swimming.
        b. Is Pete swimming ?

Strictly speaking, however, transformations express relations between structures neither of which need to be actual sentences, they are relations holding between phrase markers, therefore, relations between intermediate descriptions of sentences. Actually, transformations are structural operations performed on PMs.

A transformation is characterized by a description of the tree to which it applies - this is the structural desctiption of the transformation (=SD), and by a description of the change, or operation which it effects, yielding a derived tree - this is the structural change (=SC) of the transformation. Therefore, formally, a transformation is an ordered pair {SD, SC}. The SD defines the domain of the rule, that is, the class of strings (PMs) to which the rule can apply, indicating a particular constituent configuration. The SC shows how the input string (PM) is modified.

As a first example, consider the following Aspects-style formulation of the Passive, the rule which relates sentences (1a) - (1b).

(3)   Passive

	X	NP	Aux	V	NP	Y	
SD	1	2	3	4	5	6	
SC	1	5	3+be	4+en	$\varnothing$	6	by+2

$\Rightarrow$

In (4a), we have analysed a PM representing sentence (1a), so as to show that it satisfies the SD of Passive. More technically, we say that PM (4) can be *properly*

analyzed with respect to Passive. Consequently, passivization can apply, deriving sentence (1b).

(4) a.


```
                        S
        AvP                         S
        Av        NP                      VP
               Det   N              Aux         MV
                                  T    V      NP    AvPrt
                                              N
        Possibly the horse   s have en throw   Dick    off

           1          2       3    4            5       6
```

b.


```
                  S
  AvP                     S
        NP              VP
  Av     N     Aux             MV              PP
             T        V   NP  AvPrt  P    NP
                      V                    Det  N
  Possibly Dick   s have en be  throw en [ ] off  by the horse

     1    5         3   + be   V + en  ∅    6    by   2
```
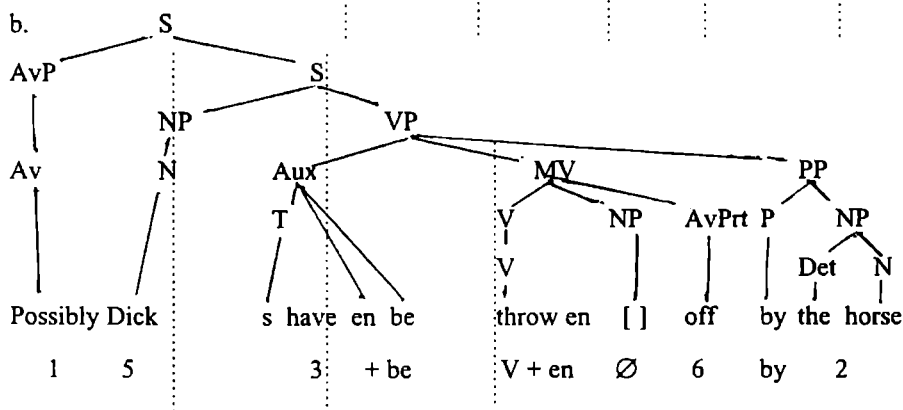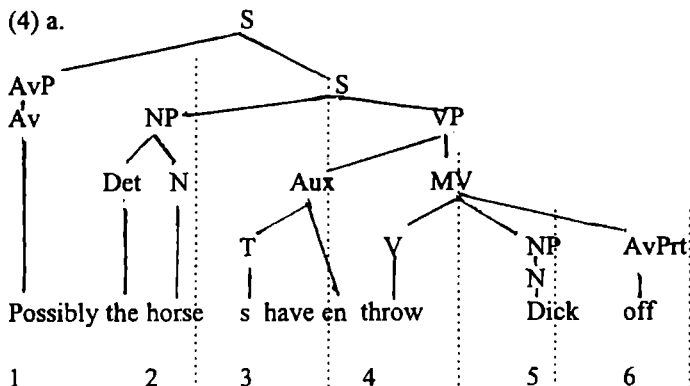
2. The transformational level.

If we were to present transformations as constituting a second level of syntactic description, we would say that the primitives of this T-level are PMs. The *elementary operations* of the T-level, i.e., the types of changes transformations may produce, are more diverse than in the case of the PS level, where the only admissible operation was concatenation. A general property of transformations, which derived from the global organization of classical TG (cf. Katz - Postal (1964), Chomsky (1965), was that transformations are *meaning preserving*, so that the underlying and the surface structure of a sentence are semantically (i.e., truth - functionally) equivalent. The fact that transformations should not alter meaning severely constrains the application of the admissible elementary operations of the T-level. The T-level includes the following elementary operations described in 2.1. below.

2.1. Deletions. These are operations which erase a consitutent specified in the SD of a transformation. For instance, the verb in the second coordinate sentence of (5a) can be erased, producing sentence (5b).

(5)a.[$_s$[Dick]$_{NP}$ [$_{VP}$[$_V$ drank]$_{NP}$ [tea]]]$_s$ and [$_s$[$_{NP}$ Martha] [$_{VP}$[$_V$ drank] [$_{NP}$ coffee]]

b. Dick drank tea and Martha - coffee.

Since transformations are meaning preserving, deletions must obey the important condition of *recoverability*; this means that constituents which are deleted must be recoverable, that is, must be retrievable from the surface structure of the sentence. If this were not the case, the deletion of a constituent would entail a loss of information, and thus a change of meaning, in violation of the principle that transformations preserve meaning. In the quoted example, the deleted verb is identical with the verb in the first coordinate sentence; therefore, the deleted term is recoverable.

As a consequence of recoverability, the grammar imposes on deletions the constraints stated in (6) and (9).

(6) Terms are deletable under identity.

This means that one can delete a term which is 'the same' as another term, in some sense. 'Sameness' or 'identity' may be viewed as sameness of meaning, or, it may be understood as sameness or identity of reference. Consider the examples below:

(7)   a. I like [$_{NP}$ [$_{Det}$ this] [$_N$ painting]], but not [$_{NP}$ [$_{Det}$ that] [$_N$ painting]].

b. I like [$_{NP}$ [$_{Det}$ this] [$_N$ painting]], but not [$_{NP}$ [$_{Det}$ that] -].

(8)   a. It would please <u>George</u> [for <u>him</u> to run for president].

b. It would please George: [- to run for president].

In the first pair of examples, the noun *painting* was deleted under sameness of meaning with the first occurrence of the same noun; note that the underlined NPs have different referents. In the second pair of examples, the subject of the infinitive clause was deleted under coreference with the Direct Object of the main clause. The second constraint on admissible deletions is (9).

(9) Terms are deletable because they are indefinite, and do not carry semantically specified information.

This principle, which is probably self-evident, is illustrated by pairs of examples of type (10), (11).

(10)   a. George was reading something
b. George was reading.

(11)   a.The window was broken by someone.
b.The window was broken.

1.2. Insertions represent a second kind of elementary operations performed on trees. An element is inserted in a tree structure in a position which has been, or has become, empty. Handy examples from the grammar of English include the insertion of

the formal subject *there* (cf.(12a,b)), or the insertion of the formal subject *it* in a position vacated by a subject clause which has been extraposed (i.e. moved to the (right) end of the sentence, as in (13a, b)).

(12)   a. A book was lying on the floor.
           b. There was a book lying on the floor.

(13)   a.[That she should be wasting his money on trifles] worries him sick.
           b. It worries him sick [that she should be wasting his money on trifles].

Because transformations are not supposed to change meaning, they are not allowed to insert meaning-bearing elements, but only *grammatical formatives*, which form a class of designated items in each grammar. To verify the claim that the introductory anticipatory *it* in (13b), which was transformationally inserted, is indeed a formal word, devoid of meaning, notice the following contrast, between the legitimate question (14b) and the illegitimate question (15b).

(14)   a. It still worries him sick.
           a'. That she should be wasting his money still worries him sick.
           b. What worries him sick ?

(15)   a. It worries him sick that she should be wasting his money.
           b. *What worries him sick that she should be wasting his money?

The referential *it* in (14a) or the subject clause in (14a') can be questioned, because they are contentful; in contrast, the introductory anticipatory *it* cannot be questioned, (question (15b) is ill-formed), because, this pronoun has no lexical content.

2.3. <u>Movement operations</u>, which reorder constituents, form the most important class of elementary operations. Depending on the landing site of the moved constituent, we distinguish between *substitutions* and *adjunctions*.

In the case of *substitution*, the mover ends up in an empty, base-generated, position. As an example, consider the passival construction in English, a construction which is known to involve transitive verbs. The object of the transitive verb becomes subject, just as in the case of passive constructions, but the verb retains active form. Here are examples:

(16   a. Coffee grinds well.
           b. This material doesn't wash.
           c. These books sell like hot cakes.

The examples in (17) - (18) show the difference between an intransitive use of a transitive verb, resulting from object deletion, and the intransitivity of a passival construction. In the first case, the verb has two arguments in the underlying structure. In the second case, only one argument, the Direct Object, is present in the DS.

(17)   a. John drove his car to London.
           b. John drove - to London.
           c. What did John drive to London ?

(18)   a. This car drives well.
           b. *What does this car drive ?

Accepting that the DS of (18a) is (19a), Passival formation can be described as an instance of substitutions: the object moves into the the base-generated subject position (possibly leaving a trace behind, see more on this in the next section).

(19)
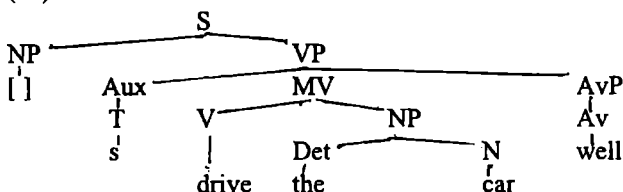
(20)
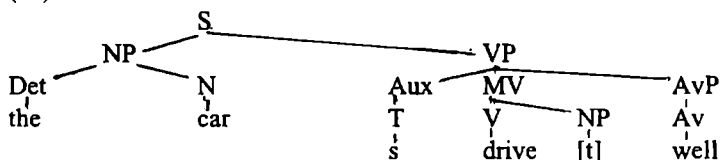
In the case of *adjunctions*, the constituent that leaves its location is placed, that is, adjoined, to the right or to the left of another designated consituent. Depending on the position of the mover in derived structure one distinguishes between *sister adjunction* and *Chomsky adjunction*. In the case of sister adjunction, after movement, the moved consitiuent has become a left or right sister node of the constituent to which it has adjoined, both nodes are "on the same level". A classical example is Dative Movement, the rule which was supposed to operate on ditransitive prepositional constructions of type "verb + Direct Object + Indirect Object", converting them into prepositionless constructions of type "verb + Indirect Object + Direct Object" (cf.(20a-b, 21a-b)). The rule was usually stated as in (22), where term 5 has left-sister-adjoined to term (3). Trees (23a, b) were properly analysed, with respect to the SD and SC of Dative Movement.

(20)   a. They offered flowers to the ladies at the party.
           b. They offered the lady flowers at the party.

(21)   a. They bought theater-tickets for the guests.
           b. They bought the guests theater tickets.

(22) **Dative Movement**

	X	V	NP$_1$	to /for	NP$_2$	X
SD	1	2	3	4	5	6
SC:	1	2	5+3	∅	∅	6

(23) a.


```
          S
    NP ──────── VP
    △     Aux ──── MV ──────────────────── PP
          T    V ── NP ── PP           P ──── PP
          |    |    |     P ── NP       |   Det ── NP
          |    |    |     |   Det ── N   |    |     N
   They   ed  offer flowers to  the  ladies  at  the  party
    1     2    3    4       5              6
```

b.


```
          S
    NP ── | ──────── VP
    △     Aux ──────── MV ──────── PP
          T    V ── NP ──── NP   P ── NP
          |    |    |       |    |  Det ── N
   They   ed  offer the ladies flowers at the party
    1     2       5 +      3        6
```

Thus, in structure (23b), the Indirect Object [*the ladies*]$_{NP}$ is sister-adjoined to the Direct Object [*flowers*]$_{NP}$, the preposition of the Indirect Object (term 4 of the SD) has been deleted.

Chomsky-Adjunction (or simply "adjunction" in what follows) is a second type of adjunction: if a node B is (Chomsky) - adjoined to A, then a copy of node A is built over A, which then immediately dominates both A and B, as schematically shown in (24). The intuition to express is that, after adjunction, A + B together form a constituent of the same kind as A.

(24)


```
         C                        C
   X ──── A ──── Y    =>    X ──────── A ──── Y
        B                      B ────── A
```
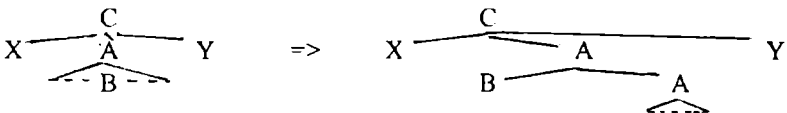
An example is offered by Left Dislocation, a stylistic rule which chops an NP constituent away and topicalizes it, leaving behind a pronominal copy of it (see sentences (25), represented in (26)).

(25)   a. We simply love Shakespeare ever better.
       b. Shakespeare, we simply love him ever better.

(26)　a.
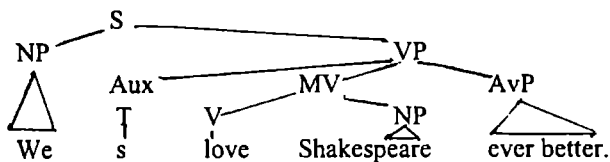
b.
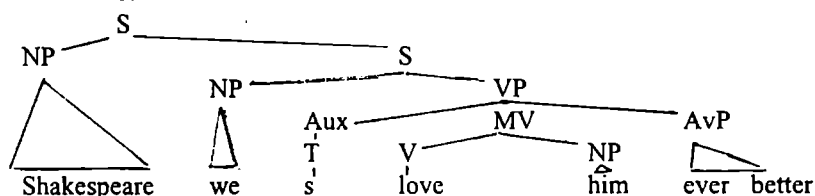
The dislocated Direct Object is left - adjoined to the node S in (21b); a copy of the node S dominates the sequence *dislocated NP + sentence*, which is itself a sentence.

2.2. While the elementary operations of the T-level were the structural operations just described, transformations themselves constituted the *rules* of the T-level. Transformations operated on the phrase markers produced by the base component, yielding a series of derived phrase markers, the last of which was the surface structure.

Two general properties of transformations have been mentioned so far. One is that transformations were supposed to be meaning-preserving. The other is that *transformations always operate on constituents* (specific nodes), not arbitrary strings. In fact, transformations are the most reliabale tests in establishing constituency. Transformations differ from elementary operations in that they generally involve more than one elementary operation. For example, Dative Movement included the deletion of the preposition *to / for* and the sister adjunction of the indirect Object to the Direct Object. In the early stages of GG, transformations were thought of as construction - specific rules, generating some traditionally established class of sentences, as the names given to these transformations showed; the "Passive", generated the class of passive sentence, "Dative Movement" generated sentences with ditransitive verbs, used in the structure V ⌐ IO ⌐ DO, etc. Transformations were thus complexes of elementary operations involved in the derivation of a particular construction.

A full specification of the rule indicated, in addition to the pair {SD, SC}, whether the transformation was obligatory (as was the insertion of DO in a negative sentences like (27a) below) or optional (as was the contraction of *not* in (27c) below).

(27)　　a. John did not go there.
　　　　b. *John　not go there.
　　　　c. John didn't go there.

In addition, various conditions could be added to characterize the terms of a SD, so as to better delineate the domain of application of the rule. As an example of a highly constrained rule, let us consider *There* Insertion (excluding however the so-called presentational *There* - constructions e.g., *There is always the usual drunken sailor on the corner.*). A typical paradigm illustrating the properties of there sentences is given in (28) - (33) below:

(28) a. A boy was in the classroom.
   Exist-b. There was a boy in the classroom.
   c. The boy was in the classroom.
   d. *There was the boy in the classroom.

(29) a. A boy sold flowers outside.
   b. *There sold a boy flowers outside.
   c. A boy was selling flowers outside.
   d. There was a boy selling flowers outside.

(30) a. The boy threw a ball outside the window.
   b. *There threw a boy a ball outside the window.
   c. A ball was thrown outside by the boy.
   d. There was a ball thrown outside the window by the boy.

(31) a. Several boys came into the room.
   b. There came several boys into the room.

(32) a. There hadn't been any girl selling flowers there.
   b. Had there been any girl selling flowers there ?

(33) There was no book lying on the desk, was there ?

There-insertion actually combines two elementary operations: it sister adjoins the "real" subject to the right of the appropriate verb (e.g., *be, come*) and it inserts the formative *there* in the empty subject position. It could tentatively be stated as in (34).

(34) There-Insertion (tentative)

	X	NP	X	V	X
SD	1	2	3	4	5
SC	1	there	3	4+2	5

(35) a.

b.

```
          S
  NP ‾‾‾‾‾‾‾‾‾ VP
 There  Aux ‾‾‾‾‾ MV
         │     V ‾‾ NP ‾‾ PP  ·
        be    a boy  in the room
```
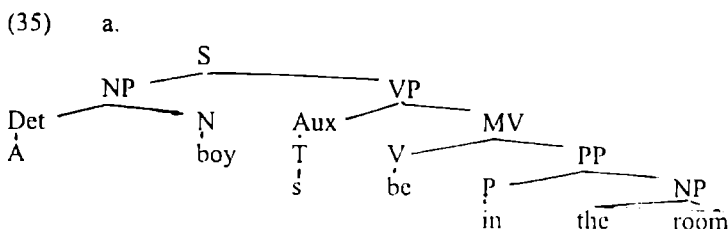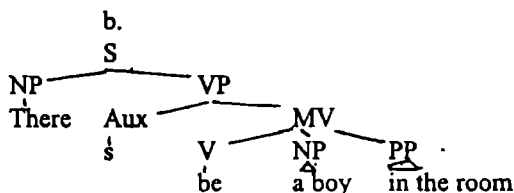
Rule (34) correctly indicates that the formative *there* is in subject position and, therefore, acquires subject properties; for instance, *there* is inverted with the auxiliary `in questions (cf. (32b)), *there* is copied in tag questions (cf. (33)), etc. But in the form given in (34), the rule overgenerates, it could yield any of the ungrammatical sentences in (28)-(33). This is why the statement of the rule in (34) has to be supplemented with conditions on both the subject and the verb in the structural description of *There*-insertion. The ill-formedness of (28d), in contrast with the well- formedness of (28b), indicates that the real subject should be indefinite, a condition which all the correct sentences in (28)-(33) meet. Examples (28)-(30) show that *be* sentences fall into the domain of There - insertion, when *be* is a main existential verb (sentence(28b)), when *be* is the auxiliary of the prograssive (sentence(29d)) or when *be* is the auxiliary of the passive (sentence (30d)); sentences where be is a copula fall outside the domain of *There* - insertion (*Many boys are music lovers. *There are many boys music lovers.*). In addition to the verb *be*, there are a few more intransitive verbs that allow *there* insertion: *come* (sentence (31b)), *go, enter, appear*, a.o. *There* insertion is obviously an optional rule, relevant at the level of the information structure of the sentence; its functional role is to place an indefintie subject in focus position, supplying an empty theme (i.e., *there*) in its place. Incorporationg all these particular facts, we could reformulate *There* - insertion as below:

(36)   <u>There - Insertion</u> (optional)

	X	NP	X	V	X
SD	1	2	3	4	5
SC	1	there	3	4+2	5

Conditions: 2 = [- Definite]

4 → *be, come, go, appear*, a.o.

The last example we have given reveals in a telling manner certain difficulties involved in the concept of transformation. It was not exactly clear how many terms could be mentioned in the SD of a transformation, how many operations a single transformation could perform, how many, and what kind of conditions one was allowed to add to the statement of a rule. This state of affairs was undesirable.

Mehodologically, viewed as descriptive devices, transformations were too powerful. Almost any particular fact could be squeezed into a transformation. The

linguist was given too many options in the construction of the grammar. From a more general theoretical perspective, rules of such complexity should be difficult for the learner. Yet, experimental evidence dealing with sentence processing-time only partly corroborated the hypothesis that derived strings need more time to be processed than basic (underived) strings. Transformed strings were not always as difficult to process as predicted. It soon became obvious that one had to uncover the principles and regularities characterizing classes of transformations, factoring out the more general principles from the particular descriptive facts of a rule. The general principles could then be viewed as a part of UG, which is not learned, therefore; the burden of the learner is then assumed to be easy; general conditions imposed on rules permit a sharp reduction in the expressive potential of the rules; there are fewer options given to the linguist in writing the grammar of a language L; the class of grammars available to the learner in view of given data is likewise restricted.

Early research on transformations led to the setting up of several classes of transformations in terms of their formal properties, as well as to the postulation of certain general principles, governing the application of transformations. We here briefly review only those aspects in the theory of transformations which are still relevant for the current developments of linguistic theory.

3. The cyclic principle.

This is a very general condition on the application of rules. The empirical problem that it addresses is that, as a consequence of the fact that S, NP, etc. are recursive symbols, it is possible that the SD of a transformation is met several times in the same PM; for example, the SD of Passive is met twice in PM(37), since both *know* and *steal* are transitive verbs; The question is whether Passive simultaneously operates on S_1 and S_2, or whether it operates first on S_1 and then on S_2. (The result would be in either case something like: *It is known by the police that the jewels were stolen by Smith*.)

(37)
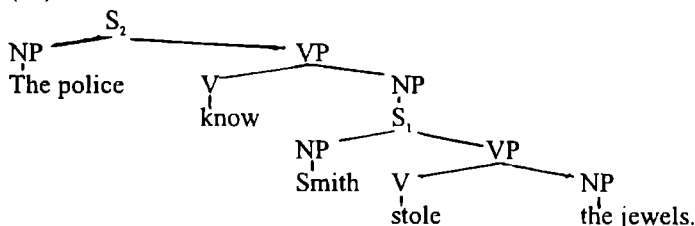
To answer this question, it is logically possible to formulate at least the following types of conventions on the application of transformations (cf. Soames,1979: 129 - 179): a) There is only one domain of application. Rules can apply to any part of the tree that satisfies the SD; they may apply in some derivations from bottom to top and in others from top to bottom. This is the "anywhere theory", also known as the principle of "linear grammar" (Grinder (1971)). b) There are several domains of

application. The domain of application is a cyclic node and the only (or main) cyclic nodes are S and NP. Rules apply from bottom to top. First all the rules are tested for application on the lowest cycle, then, on the next cycle, a.s.o. This is the *'Cyclic Principle'*.

The choice of one of these alternatives is not an a priori, but an empirical, matter. The strongest kind of argument brought in favour of the cyclic principle is that there are grammatical sentences which are derivable in a cyclic grammar, but not in a linear grammar. We will mention one example of this sort, which involves the two rules of Raising and Reflexivization. Oversimplifying matters, we might say that Raising is a rule which operates on the subject of an embedded (infinitive) clause and moves it into the main clause, where it becomes subject of the main clause (when the main clause verb is intransitive e.g., *appear, happen*) or object of the main verb (when the main clause verb is transitive, e.g., *believe, expect, consider*). Here are examples, which illustrate the movement of the embedded subject into the main clause.

(38)   a.   It appears [that the guest was severely ill last night.]
                The guest appears [- to have been severely ill last night]
        b.   It happens that we have met before.
                We happen [- to have met before]

(39)   a.   Authorities believe [that the IRA planted this bomb.]
                Authorities believe the IRA [- to have planted this bomb]
        b.   I expect that the guests will be late tonight.
                I expect the guests [- to be late tonight].

Let us remark in passing, that, for transitive sentences like (39b) an alternative analysis, which does not involve movement is currently available; for the time being let us accept that Raising operates in both (38) and (39). Reflexivization is a rule which turns into a reflexive pronoun the second of two coreferential NPs, *provided that they are in the same simple sentence.* Here are a few examples:

(40)   a.He dressed himself up for the party.
        b.I talked to Laura about herself .
        c.He doesn't belong to himself anymore.

(41)   a.I saw myself in the mirror.
        b.*I saw me in the mirror.
        c.I saw that I was pale.
        d.*I saw that myself was pale.

Notice sentences (41b) and (41c, d), in particular. Sentence (41b) shows that Reflexivizaiton is an *obligatory* rule. If there are two coreferent NPs in the same simple sentence, the second NP must be a reflexive pronoun. Sentences (41c, d) show that Reflexivization operates only on clause mates, it cannot affect a coreferent NP which is in another sentence than the first; this explains the ungrammaticality of (41d). As

announced, we intend to quote an argument for cyclicity, stating that certain sentences are derivable only if the Cyclic Principle is assumed. The derivation of such sentences requires that some rule of the grammar R applies both before and after some other rule R , in the following sequence:

Rule₁ ... Rule₂ ... Rule₃

No intermediate string in the derivation is properly analysable with respect to R , except the string created by the first application of R . The application of R_i produces a structural change that prevents it from applying to its own output. Subsequent to the first application of R_i, no intermediate string meets the SD of R_i, except the output string of R_j. The application of R_j feeds R_i, so that the two applications of R_i are possible only in case R_j applies between them. Consider now sentences like (42):

(42)   a. Harry₁ expected himself₁ to shave himself₁ that morning.
        b. Sam₁ expected himself₁ to be able to defend himself₁.

There is unequivocal morphological proof that Reflexivizaiton has applied twice; in each case, the two applications of Reflexivization are separated by one application of Raising, which feeds Reflexivization. Consider the derivation of (42a) under the cyclic principle, assuming that each sentence is a cyclic domain. Reflexivization applies on the first cycle to the coreferential NP_2 and NP_1 (cf. 44). Raising, which is triggered by an appropriate transitive verb like *expect*, can only apply on the second cycle. At the same time, on the second cycle, the application of Raising creates the structural configuration for the second application of Reflexivization, because only after Raising has applied (intermediate PM (44)), the two coreferential NPs (NP_1 and NP_2) are in the same simple sentence (S_2) and the second of them (NP_2) must become a reflexive pronoun.

(43)
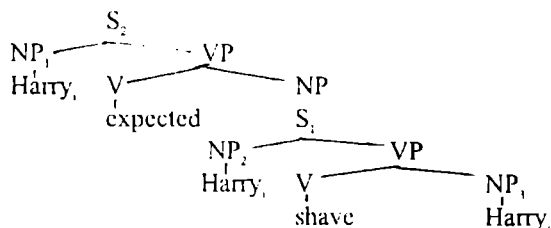
(44)
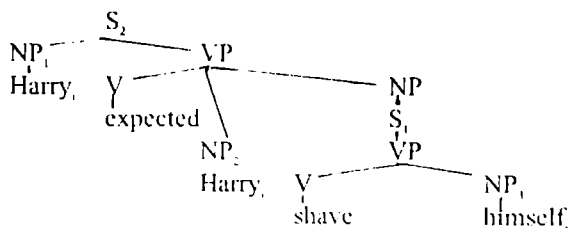
(45)
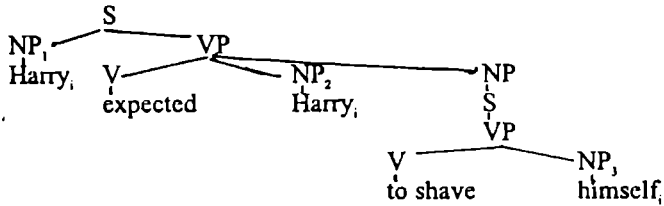
(46)
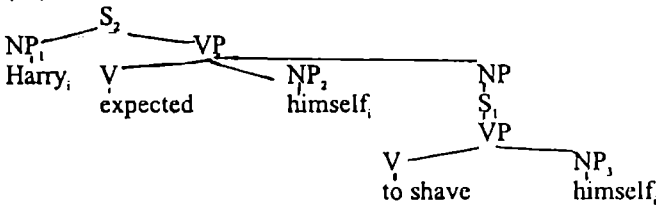
The sentence is underivable under the Linear Theory. Suppose we adopt the anywhere convention and apply Reflexivization wherever we can in (43), i.e., in S_1; this produces (44). Next we may apply Raising wherever we can in (43, 44), i.e., on S_2; This produces (45), i.e., the ungrammatical sentence (47).

(47)   *Harry$_i$ expected Harry$_i$ to shave himself$_i$.

Suppose the reverse order is tried. We start by applying Raising on PM (43). This would produce the intermediate structure (48). Applying now Reflexivization anywhere we can, we get PM (49), corresponding to the ungrammatical sentence (50).

(48)
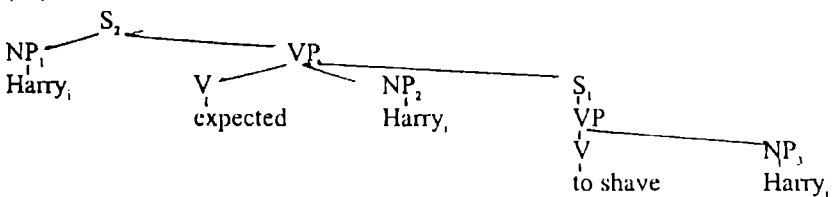
(49)
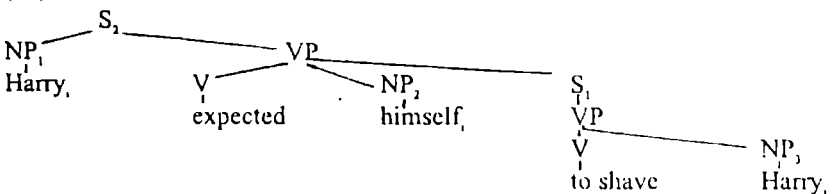
(50)   Harry$_i$ expected himself$_i$ to shave Harry$_i$

There is thus strong empirical evidence for the cyclic theory, which was adopted as an important metacondition in the functioning of generative grammar. The Cyclic Principle must in fact be strengthened to a principle of *strict cyclicity*, stated in (51).

(51)   Strict cyclicity -
No cyclic rule can apply on a given cycle to any structure wholly within the domain of a lower cycle.

To understand the relevance of stricit cyclicity, consider an underlying structure like (52), containing the verbs *expect* and *prove*, which are optional Raising triggers. Subject to Object Raising is free to apply or not on each or on either cycle (S_1 and S_2), producing the well formed sentences (53a-d). All of these derivations are consistent with the Cyclic Priciple and with Strict Cyclicity.

(52)

```
          S₃
   NP          VP
   Bill    V         S₂
        expects  NP        VP
              Phillis   V        S₁
                      will   NP        VP
                      prove  Phillis  is incompetent
```
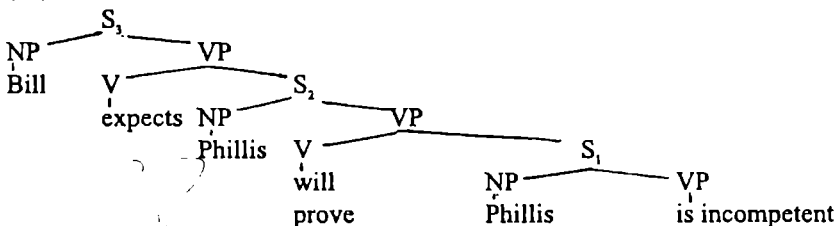
(53)   a. Bill expects that Phillis will prove that she is incompetent.
(no application of Raising or of Reflexivization)
b. Bill expects that Phillis will prove herself to be incompetent.
(application of Raising and Reflexivization on S_2)
c. Bill expects Phillis to prove that she is incompetent.
(applications of Raising on S_3)
d. Bill expects Phillis to prove herself to be incompetent.
(application of Raising and Reflexivization on S_2, followed by Raising on S_3).

Suppose we do not adopt the principle of strict cyclicity. Suppose that in some derivations, Raising is not applied on S_2, so that the Cycle of S_3 is reached without any application of Raising (or Reflexivization). Suppose that Raising applies on S_3, for the verb *expect*, producing PM (54), (corresponding to sentence (53d) above). Notice that in (54), the two coreferent NPs ($NP_2 = NP_3$) are in different clauses.

(54)

```
          S₃
   NP₁         VP
   Bill    V      NP₂        S₂
        expects  Phillis     VP
                       V           S
                    to prove  NP₃        VP
                              Phillis  is incompetent
```

(55)

```
        S₃
  NP₁        VP
  Bill   V      NP₂        S₂
       expects Phillis₍        VP
                        V          NP₃   S₁
                     to prove    Phillis₍  VP
                                       to be incompetent
```
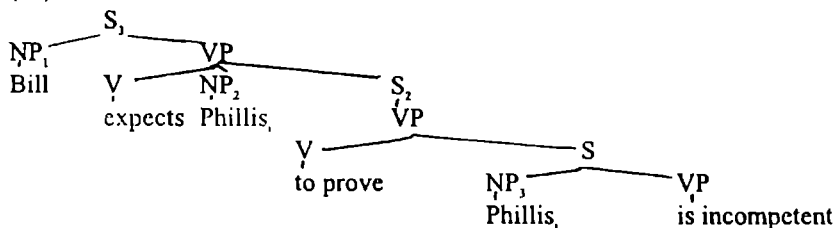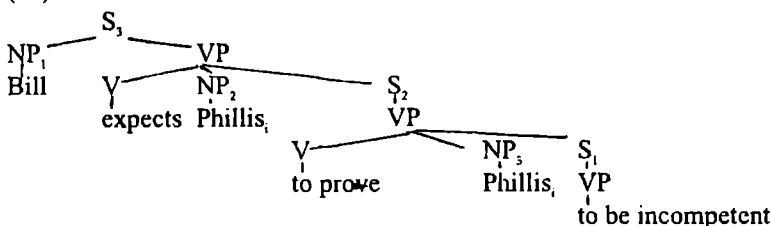
Now, if strict cyclicity is not observed, then raising (still operating on the cycle of S₁) might equally well apply for the verb *prove*, producing the structure in (55). Notice now that the corefrent NPs, NP₃ and NP₂, continue to be in different clauses, so that Reflexivization cannot apply. The second NP may be replaced by a personal pronoun, but the derived sentence (56a) (instead of (56b)) is ungrammatical in the intended interpretation.

(56)   a.Bill expects Phillis₍₋ to prove her₍₋ to be incompetent.

b.Bill expects Phillis₍ to prove herself₍ to be incompetent (= 53d).

Examples as the one we have just discussed show the necessity of the Strict Cyclicity Principle. Conventions governing the application rules are not part of the grammar of any language, but belong to UG.

4. The Domain of transformations. Bounded and unbounded movement rules.

It also became apparent that transformations fall into classes that share important formal properties. One relevant criterion of classification regarded the domain of application of a transformation. The following basic typology emerged with respect to the domain of application: a.*Monocyclic transformations:* transforamtions that operate within one clause (S - domain). This is the case of Passive, Dative Movement and Reflexivization as already seen above. b.*Bicyclic transformations*: these are rules that operate across exactly one S - boundary. An example is Raising, which moves the infinitive subject into the *first* sentence up. The contrasts below show that the raised constituent cannot travel further than one sentence up in a *single* step.

(57)   a.Bill expects[that Phillis₍ will prove[that she₍ is incompetent]].

b.[Bill expects [that Phillis₍ will prove herself₍ [-- to be incompetent]]]

c.*[Bill expects Phillis₍ [that she₍ will prove [--- to be incompetent]]]

d.[Bill expects Phillis₍ [--- to prove herself₍ [-- to be incompetent]]]

Sentence (57c) is ungrammatical because the raised NP has crossed more than one S - boundary, as indicated above. Monocyclic and bicyclic rules are both rules that have a *bounded domain*, in sharp contrast with the next class of rules, in fact called *unbounded* rules: c.*Unbounded transformations*: these are rules that operate across arbitrarily many S-boundaries, such as Wh-Movement (see below).

4.1. In the remaining part of this section, we will review some important facts and principles regarding unbounded movement rules. As examples, let us consider Question Formation, Relativization and Cleft-Sentence Formation. As an expository device, a coindexed trace was left behind to indicate the initial position of the displaced constituent.

(58)   Questions

a. The police arrested Smith.
  Who$_i$ did the police arrest t$_i$?
b. Bob said that the police arrested Smith.
  Who$_i$ did Bob say [that the police arrested t$_i$]?
c. [You claimed [that Bob said [that the police arrested Smith]]].
  [Who$_i$ did you claim [that Bob said [that the police arrested t$_i$]]]?
d. [It is true [that you claimed [that Bob said [that the police arrested Smith]]]].
  [Who$_i$ is it true [that you claimed [that Bob said [that the police arrested t$_i$]]]?

(59)   Relative clauses

a. The police arrested Smith.
  [The man [who$_i$ the police arrested t$_i$]is Smith.
b. Bob said that the police arrested Smith.
  [The man [who$_i$ Bob said [that the police arrested t$_i$]] is Smith].
c. [You claimed [that Bob said [that the police arrested Smith]]].
  The man [who$_i$ you claimed [that Bob said [that the police arrested t$_i$]]] is Smith.
d. It is not true [that you claimed [that Bob said [that the police arrested Smith]]].
e. The man [who$_i$ it is not true [that you claimed [that Bob said [that the police arrested t$_i$]]]] is Smith.

(60)   Cleft sentences

a. The police arrested Smith.
  It is Smith [who$_i$ the police arrested t$_i$]
b. Bob said that the police arrested Smith.
  It is Smith [who$_i$ Bob said that the police arrested t$_i$].
c. You claimed [that Bob said [that the police arrested Smith].
  It is Smith [who$_i$ you claimed [that Bob said [that the police arrested t$_i$].
d. [It is not true [that you claimed [that Bob said [that the police arrested Smith]]]].
  [It is Smith [who$_i$ it is not true that you claimed that Bob said that the police arrested t$_i$]]]].

The examples clearly show that the relative or interrogative pronoun, in other words, the *wh-phrase* can be extracted out of deeply embedded clauses, crossing arbitrarily many sentence boundaries (three sentence boundaries in examples (58, 59, 60c), four sentence boundaries in examples (58, 59, 60d)) in its way to the front position of a question or of a relative clause. The behaviour of the wh-phrase in (58)-(60) offers a clear example of an unbounded movement rule.

Before we continue this discussion, a few auxiliary notions need to be introduced. First, since questions, relative clauses and cleft contructions pattern together, it will be assumed that the same rule is involved in deriving them; this rule is known as Wh - Movement. Secondly, we have said little or nothing so far regarding the phrase structure of subordinate clauses. A subordinate clause or embedded clause is usually introduced by some subordinationg element or subordinator. The subordinator may be a highly abstract virtually meaningless element like *that, for* whose sole role is to transform an independent clause into a dependent of some predicate. Such an element (e.g., *that, for. if*) will be called a complementizer.

(61)   a. It is important [that $_s$[you should come].
        b. It is important [for $_s$[you to come].
        c. It is not known [whether / if $_s$[he will come].

Alternatively, a subordinate clause may be introduced by a relative / interrogative pronoun or adverb. At the present stage of English, wh-phrases and complementizers do not occur together. but this is possible in some languages and was also possible in older stages of English.

(62)   It is not known [what [he will say]].
        It is not important [where [he says he is going to go t]].

Let us assume, roughly following Bresnan (1970, 1972), that the initial position of a clause is a complementizer position, COMP, introduced by rules (63). S' (read S bar) is a projection of S, a higher order consituent of the same type as S.

(63)   S' → COMP⌐S
        S→NP⌐ VP
        COMP → (XP)⌐ { that / for / whether }

The left-hand area of the COMP expansion (XP) serves as the target for Wh - Movement, i.e. a landing site for the moved wh - phrase. Given this, Wh - Movement can eventually be formulated as follows.

(64)   Wh - Movement

	COMP	X	wh-phrase	Y
SD	1	2	3	4
SC	3	2	∅	4

Two remarks are in order here. Term 2 of the SD refers to the arbitrarily complex string across which the wh-phrase travels; it is a string whose constituency cannot be specified; when such a string occurs between two constant terms of a SD, it is

referred to as an essential syntactic variable. Term two is an *essential variable*. Secondly, notice that the rule is stated as an example of subtitution into the COMP position.

As stated in (64), the rule does not say how the wh-phrase travels; i.e., whether the wh-phrase successively crosses each S-boundary or whether it moves to its final position in a single swoop. Both accounts have been proposed in the literature, but the first, known as the successive-cyclic movement hypothesis, was ultimately preferred. The successive cyclic movement hypothesis naturally follows from the cyclic principle, according to which cyclic rules apply first in an embedded clause and then in a higher clause. Consider sentence (65a), with representations (65b-c):

(65) a. What did you say the professor thinks that I should read?
b. [$_S$ COMP [$_S$ you said [$_S$ COMP [$_S$ the professor thinks [$_S$ COMP [$_S$ I should read what,]]]]]].
c. [$_S$ What, did [$_S$ you say [$_{CP}$ t, [$_S$ the professor thinks [$_S$ t, [$_S$ I should read t,]]]]]].

It may very well be assumed that the derivation of (65a) proceeds stepwise on successive cycles, making use of all the intermediate COMP positions; the passage of the wh- phrase through the several COMP positions is indicated by a coindexed trace left behind. In fact, the successive cyclic hypothesis is the null hypothesis; it comes at no cost and additional machinery would be needed to exclude it. While the successive cyclic hypothesis is certainly to be preferred on grounds of simplicity (i.e., on considerations internal to the theory), there is also empirical evidence that favours this hypothesis. Freidin (1992) quotes the fact that each of the trace positions in (65c) could actually have been a landing site for the wh- phrase; thus, with appropriate verbs that accept both declarative and interrogative complement clauses, all of the following sentences are possible; the wh-element shows in each of the COMP positions in turn; the first sentence (66a) may be read as an echo question with the wh - phrase in situ.)

(66)a.[$_S$ [$_S$ Martha told Ben [$_S$ that [$_S$ Barbie said [$_S$ that [$_S$ Bernie indeed knows [$_S$ [$_S$ Adam wants what,]]]]]]]
b.[$_S$ [$_S$ Martha told Ben [$_S$ that [$_S$ Barbie said [$_S$ that [$_S$ Bernie indeed knows [$_S$ what, [$_S$ Adam wants t,]]]]]]].
c. [$_S$ [$_S$ Martha told Ben [$_S$ that [$_S$ Barbie said [$_S$ what, [Bernie indeed knows [$_S$ t, [Adam wants t,]]]]]]].
d. [$_S$ [$_S$ Martha told Ben [$_S$ what, [$_S$ Barbie said [$_S$ t, [Bernie indeed knows [$_S$ t, [$_S$ Adam wants t,]]]]]]].
e.[$_S$ What, did [$_S$ Martha tell Ben [$_S$ t, [$_S$ Barbie said [$_S$ t, [$_S$ Bernie indeed knows [$_S$ t, [$_S$ Adam wants t,]]]]]]].

A very persuassive piece of evidence for successive cyclic movement is put forth by Torrego (1984), on the basis of Spanish data; her argument is briefly sketched below: Like Romanian and other Romance languages, Spanish has an optional rule of

Free Subject Inversion, which *optionally* moves the NP subject to the right, adjoining it to the VP. In Spanish, this rule operates in declarative sentences, but also in *certain* types of interrogative sentences.

(67)   a. Juan arriva.
        b. Arriva Juan.

(68)   a. Con quien vendra <u>Juan</u> hoy?
        b. Con quien <u>Juan</u> vendra hoy?

In addition to Free Subject Inversion, Spanish has a second inversion rule, which operates in interrogative clauses, when a *wh - phrase* of a certain kind or its trace appears in COMP. This inversion rule is *obligatory*.

(69)   a.Que querian <u>essos dos</u>?
        What-want-these-two
        'What do these two want?'
        b.*Que <u>essos dos</u> querian?

A difference worth mentioning to further differentiate between these two rules concerns the possibility of adverb placement. In Spanish, certain adverbs can occupy sentence initial position if Free Subject Inversion applies, but not if obligatory inversion applies:

(70)   a. Siempre lee lo mismo Maria.
        always-reads-the same-Mary.
        'Mary always reads the same thing.'
        b.*Que siempre lee Maria?
        c.Que lee Maria siempre?

The fact, that an initial adverb is no longer possible in (70b-c) suggests that the initial adverbial position is now held by the verb, which has been inverted with the subject; the rule which moves the verb in sentence initial position, a position of adjunction to S, is referred to as V(erb) Preposing. Torrego claims that V-Preposing is triggered by an appropriate wh - phrase in COMP. The derivation of a sentence like (71a) starting from a DS like (71b), involves first wh - movement to COMP, as in PM(71c); once the wh-pronoun <u>a quien</u>? is in COMP, V-Preposig applies generating (71d). It is particularly significant that V-Preposing applies in both embedded and non-embedded clauses. The examples in (72) below illustrate obligatory inversion (V-Preposing) in embedded questions which exhibit an overt wh   phrase in COMP.

(71)   a.   . A quien presto Juan el diccionario?
                  To whom did Juan lend the dictionary?

b.

```
        S'
COMP         S
    NP            VP
    Juan   V      NP         PP
           presto el diccionario  a quien
```

c.

```
        S'
COMP         S
A quien    NP              VP
           Juan   V   NP        PP
                  presto el diccionario  t
```

d

```
        S'
COMP         S
A quien  V        S
        presto NP       VP
               Juan  V   NP       PP
               | |   el diccionario  t
```
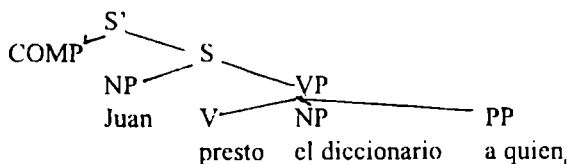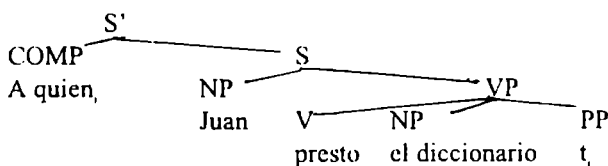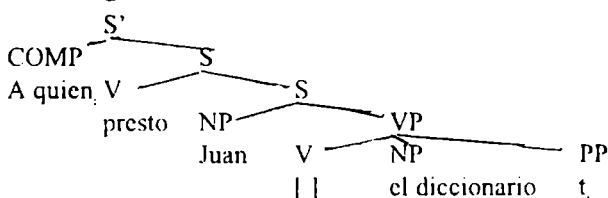
(72)   a.No sabia' que querian <u>essos dos</u>.
        b.*No sabia <u>que essos</u> dos querian.
        I don't know what they two want.

(73)   a.No me acuerdo a quien presto Juan el diccionario.
        b.*No me acuerdo a quien Juan presto el diccionario.
        (I) don't remember to whom Juan lent the dictionary.

Since V-Preposing in Spanish must apply in both matrix and embedded questions, it is possible to retrace the movement of a wh-phrase via this rule. If Wh-Movement applies successive cyclically, each of the iterative movements of a wh-phrase will cause the verb to be raised to S at each of the corresponding S' cycles. Conversely, if Wh-Movement is not successive cyclic, the verb will be preposed only in the clause in which the wh-phrase appears fronted in surface structure. This is because in a single step (non-successive cyclic analysis) a wh-phrase never passes through the intermediate COMP position of the embedded clauses. Consider now, the following sentences:

(74)a. Juan pensaba [que Pedro le habia dicho [que la revista habia publicado ya el articulo]].
        Juan thought that Pedro told him that the journal had published the article already.

b.[Que pensaba Juan [que le habia dicho Pedro [que habia publicado la revista]]] ?
What did John think that Peter had told him that the journal had published?
c. *Que pensaba Juan [que Pedro le habia dicho [que la revista habia publicado]]?

The grammaticality judgments in (74) demonstrate the empirical effects of successive cyclicity. The successive cyclic approach to Wh-Movement correctly derives sentence (72b) in Spanish. In (72b), V-Preposing has applied to the matrix sentence, as well as to the embedded clauses which show no adjacent wh-word trigger in the surface structure. Since in Spanish, obligatory inversion occurs whenever there is a suitable wh-word in COMP, it follows that there was iterative application of wh-movement on each successive S' cycle, causing iterative application of V-Preposing. Torrego's beautiful argument makes a very convincing case for successive cyclicity.

An important remaining question is whether a wh-phrase in COMP position is accessible, on the higher cycle, to rules other than Wh-Movement. Apparently, it is not. Consider (73a - c); the examples involve an application of Passive to a phrase already displaced by Wh-Movement:

(75) a.He asked which books to buy.
   b.Which books did he ask to buy?
   c.*Which books were asked to buy by him?

The ill - formed (75c) has the following derivation:

(76) $[_{COMP}$ which books$_i$ $[t$ were asked $[_{COMP}$ t$_i$ $[$to buy t$_i$ $]]$ by him$]]$.

    |_____|î_____| î_____|
      III   II   I

The first step is legitimate, effected by Wh - Movement. Step II is part of the rule of Passive. Clearly, this must be prohibited. The successive cyclic mode of application for Wh-Movement must therefore be tightened in the following manner, discussed in Chomsky (1973: 243 ff):

(77) COMP - to - COMP Conditon
   Once a phrase is in COMP, it can only move to a higher COMP.

Thus, each S' is a domain of application for wh-movement; each movement of a wh-phrase to COMP is limited within the fixed boundaries of S'; however, a series of such movements, affecting successively larger domains, creates the effect of unbounded movements.

5. Island constraints

Although wh-Movement is a very powerful rule, there are syntactic constraints which prohibit extractions. A construction from which a constituent may not be moved by a transformation is designated as an "island". The conditions that prohibit movement out of islands are called *island constraints*. The first famous inventory of islands and the first formulation of the many island constraints is due to Ross's famous 1967

dissertation, entittled "Constraints on Variabales in Syntax". The title obviously has to do with the fact that the proposed island configurations represent constraints on the form of the path the wh-phrase can cross, the essential variable string which represents term 2 in the SD of Wh-Movement given in (64) above. -Island constraints hold for any construction based on Wh- Movement. We will however limit our examples to relative clauses and questions, and briefly mention some of these constraints.

The Complex NP Constraint. (CNPC) Informally, this constraint prohibits movement out of a sentence subordinated to a noum, i.e., out of a clause which is dominated by an NP. Such an attributive clause can be a relative clause (cf. (78)) or a complement clause (79).

(78)   a. Bill found a principle [which solves the problem].
        b. *Which problem, did Bill find a principle which solves t, ?
        c.*The problem, which, Bill found a principle which solves t, was very recalcitrant.

Examples(78) show that no constituent contained in a relative clause can be questioned or relativized. The relevant configuration is (80a). Consider now extraction out of complement clauses governed by nouns, in examples(79). The island configuration is (80b).

(79)   a. He refuted the proof that you cannot square an ellipse.
        b. *What, did he refute the proof that you cannot square t, ?
        c. *The figure, which, he refuted the proof that you cannot square t, looks a bit like an egg.

(80)
a.

```
          S
      ___NP___
  NP /        \ S'
    \__NP[+wh]__/
```

b.

```
          S
      ___NP___
  Det /       \ N
   N /    \____\ S'
     \__NP[+wh]__/
```
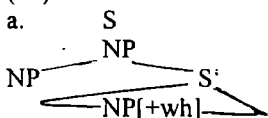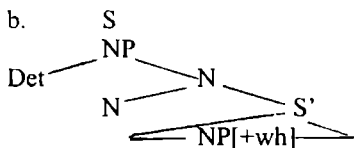
Ross (1967) proposes the following formulation of the CNPC:

(81)   Complex NP Constraint (CNPC)
No element contained in an S dominated by an NP with a lexical head noun may be moved out of that NP by any transformation.

The CNPC is not limited to Wh - Movement of NPs, as in (79) and (80), but applies to PPs or APs as well:

(82)   a. Bill rejected the suggestion that he should talk [to someone].
        *To whom, did Bill reject the suggestion that he should talk t, ?
        b. You are looking for an au- pair who is [very intelligent].
        *[How intelligent], are you looking for an au- pair who is t, ?

The (Sentential) Subject Constraint - Ross noticed that constituents cannot be extracted out of subject clauses (which are in subject position, not extraposed). Later the constraint was generalized to movement out of any kind of subject, sentential or phrasal. Here are example illustrating the impossibility of questioning or relativizing out of subjects.

(83)a.[That Mary was going out with him] bothered you.
b.*Who$_i$ did [that Mary was going out with t$_i$] bother you?
c. *The guy$_i$ who$_i$[that Mary was going out with t$_i$] bothered you is an actor.

(84)a. A nice picture of his daughter was on the desk.
b.*Who$_i$ was a nice picture of t$_i$ on the desk ?
c.*The girl$_i$ [who a nice picture of t$_i$ was on the desk] is his daughter.

The subject - island constraint can be stated as in (85a), while this particular island configuration is given in (85):

(85) a. The (Sentential) Subject Constraint ((S)SC)
• No element contained in an NP, or S which is in subject position (i.e., which is immediately dominated by S) can be moved out of that NP or S by a transformation.

b.
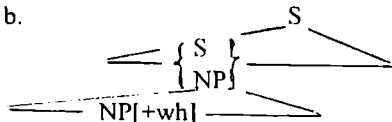
The Adjunct Constraint. There is also a ban on moving constituents out of adjunct clauses, illustrated below:

(86)a. Mary was bothered [because Peter discussed her past].
b. What$_i$ was Mary bothered [because [Peter discussed t$_i$]]?
c.The matter [which$_i$ Mary was bothered [because [Peter discussed t$_i$]]] was her own past.

The relevant configuration is roughly (87);*because* may tentatively be viewed as a preposition that takes a clause. instead of an NP, as its object, i.e., PP → P NP or PP → P S; the class of prepositions that take Ss as objects is the traditional class of subordinating conjunctions (see chapter 4, on preposition subcategorization).

(87)

We may then state this constraint as follows:

(88)   The Adjunct Constraint
No element can be moved out of an adjunct (clause) by a transformation.

The (tensed) Wh - Island Constraint is the last constraint mentioned here. A constituent which is part of a indirect question cannot be questioned or relativized. Notice that the constraint refers to tensed (finite) indirect questions. Here are examples:

(89)a. John wondered who would win a gold medal.
b. *What$_i$ did John wonder [who would win t$_i$].
c. *The medal which$_i$ John wondered [who would win t$_i$]was the gold medal.

Taken as a whole, Ross's constraints covered a very wide range of empirical data, bringing into the focus of linguistic research a significant amount of syntactic phenomena. Moreover, the research strategy he pioneered, that of defining very general conditions on the application of rules, is still at the heart of syntactic research. The unsatisfactory aspect of Ross's constraints , naturally, when they are considered from the vantage point of present-day syntax, was that most of his island constraints were, in some sense, construction specific. The formulation of the CNPC, for example directly mirrors the essential aspect of one construction: subordination of a sentence to a noun. As a result, much subsequent work concentrated on generalizing and unifying Ross's constraints. A major step in this direction was the formulation of the Subjacency Condition (Chomsky 1973, 1977).

5.1. Subjacency. The Subjacency Condition relies on the principles of strict cyclicity and successive cyclic movement already defended above. The intuition is that certain nodes, such as S or NP, the so-called bounding nodes, are particularly significant in that they define local domains inside which dependencies between elements can be set up. If the moved constituent crosses more than two bounding nodes, the dependency between the initial position and the landing site is broken.

An examination of the island configurations from this point of view will reveal at once the fact that all of them involve movement across more than one boundary node. Consider first tensed wh-island violations, as illustrated in the example below:

(90)   *Which books did you ask him [where he bought t].

Successive cyclic Wh-Movement and the Strict Cycle Condition make it possible to show that this sentence violates Subjacency and is therefore ill-formed. In (89a) we have given the D-Structure of the sentence. On the lower, S$_1$, cycle the COMP is filled by where (91b), hence, which books can only move directly to the higher COMP on the S$_2$cycle. But this movement violates subjacency, because two bounding nodes S$_1$ and S$_2$ are crossed.

(91)   a.

```
        S₃'
COMP        S₂
    NP          VP
    you     V      NP
            ask    him        COMP      S₁'
                              NP            S₀
                              he                        VP
                                        MV          AvP
                                     V      NP       △
                                     bought  which booksᵢ   whereⱼ
```

b.

```
        S₃'
COMP        S₂
    NP          VP
    you     V      NP
            ask    him    COMP       S₁'
                          AvP   NP       S₀
                          whereⱼ he              VP
                                       MV          AvP
                                     V     NP        |
                                     bought which booksᵢ  tⱼ
```

c.

```
        S₃'
COMP        S₂
NP          NP     VP
which           V      NP
booksᵢ   you    ask    him   COMP       S₁'
                             AvP   NP       S₀
                             whereⱼ he    MV       VP
                                        V       NP      AvP
                                        bought  tᵢ       |
                                                         tⱼ
```
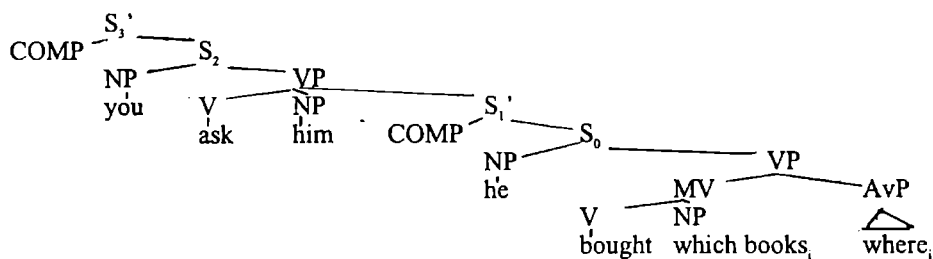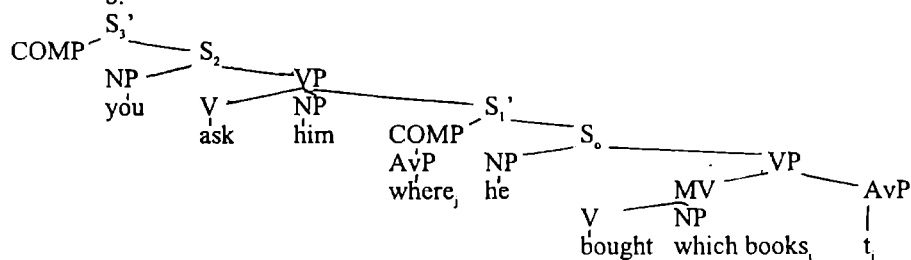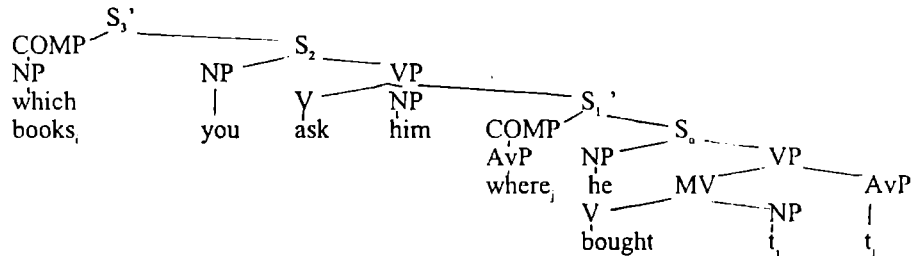
Movement out of a subject clause or a subject means that the moved constituent will again cross two bounding nodes, either two sentence nodes, as in example (92a) represented in (92b) or one sentence node and one NP node, as in example (93a), represented in (93b).

(92)   a.   *Whatᵢ did [that John explained tᵢ] bother you?
       b.

```
              S'
COMP                 S
         S'                        VP
COMP         S                     bother   you
that    NP        VP
        John   V       NP
               explained  whatᵢ
```
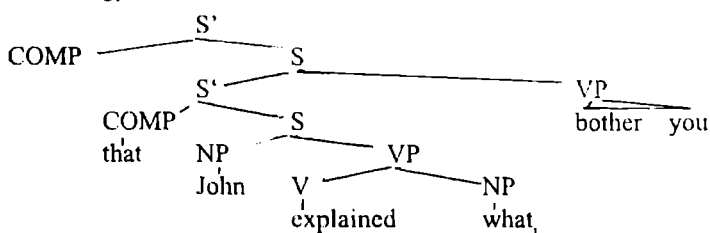
(93)   a.   *Who$_i$ was a picture of t$_i$ on his desk?

b.

```
                    S'
COMP ———————————< >——— S
                 NP —<       ———————————————— VP
             Det      N                        was on his desk
             |      N —————      PP
             a      |       P ———< >——— NP
                 picture   of          who$_i$
```
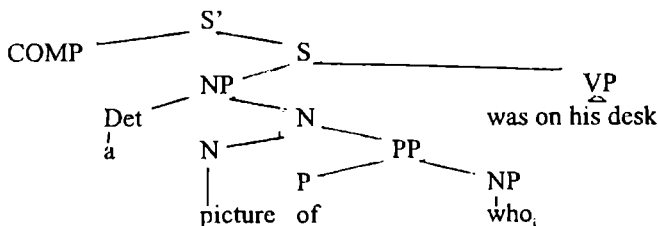
The (Sentential) Subject Constraint can thus be regarded as one particular case of Subjacency violation. The same is true about the CNPC. Consider the example below, whose (approximate) surface representation is (94b).

(94)   a. *What did Bill reject the evidence t that John did t ?

b.

```
      S'
COMP ————————————— S
NP   Aux   NP ————————— VP
What$_i$ did  Bill  V ————————— NP
                 reject  Det ———————— N
                         the   N
                             evidence      COMP ———— S
                                           t$_i$ that  NP ———— VP
                                                  John   V   NP
                                                        did   t$_i$
```
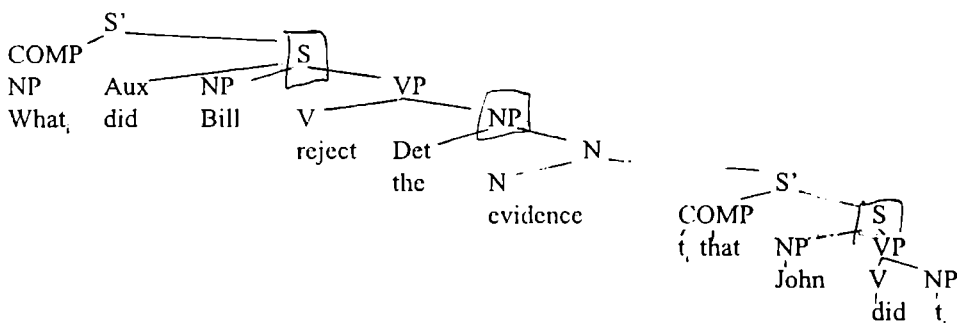
The wh-phrase legitimately travels to the first COMP node, leaving a trace behind; the second step of Wh-Movement must cross both an NP and an S boundary; this constitutes a violation of Subjacency. We leave it to the reader to verify that extraction out of adjunct clauses also violate subjacency.

One should be aware that the principle of Strict Cyclicity is crucially involved in explanations based on Subjacency. If this principle were not obeyed, certain derivations which circumvent Subjacency would become possible. Consider again the wh-island violation discussed above.

(95=90) *[Which books$_i$ did you ask John [where$_j$ he bought t$_i$ t$_j$?]]

Following Strict Cyclicity, we assumed that first where$_j$ moves to the lower COMP position in (91b) and then, *which books$_i$* has to move to the higher COMP position in a single step; since the lower COMP position is already filled by a wh-phrase, this long wh-movement constituted a Subjacency violation (91c). If we did not

adhere to Strict Cyclicity, we might consider a different derivation: *which books*, cyclically and legitimately moves first to the lower S,' COMP, and then to the higher COMP on the cycle of the main sentence. When *which books*, has reached the higher COMP position, and the lower COMP contains only the non-lexical trace t, , *where*, legitimately moves to the lower COMP position. The movement of *where*,, would affect only S,', which is a cyclic subdomain of the main clause cycle, and this is prohibited by Strict Cyclicity: this derivation, which would derive the ungrammatical (95) is correctly ruled out by Strict Cyclicity.

This discussion was started in an attempt to classify transformational rules as to their domain of application, distinguishing *monocyclic*, *bicyclic*, and *unbounded rules*. Notice now, that as a result of having adopted the Subjacency Condition, the picture becomes simpler. No rule can involve constituents separated by more than one bounding S or NP; thus only one S / NP boundary can be crossed at one time. *Transformational rules are thus at most bicyclic*, a view which represents a considerable unification and simplification.

6. The structure preserving constraint

Another major proposal, which attempted to limit the possible results of transformations, is the Structure Preserving Constraint. Initially, there were few, if any, restrictions placed on the derived phrase markers produced by transformations. But of course, if rules could move constituents to any position, then derived PMs would be arbitrary and presumably complex objects, which ought to raise difficulties for the learner. At the other end, the linguist had too much freedom in formulating the rules. To remedy this situation an important idea was to maximize the role of phrase-structure configurations, and to assume that constituents can be moved only in positions which could have been generated by the phrase structure rules. This constraint on transforamtions is known as the Structure Preserving Constraint and was proposed by Emonds (1976, 1985). This way of looking at transformations implies that not all positions generated by the PSRs need be filled by lexical insertion; some positions will be filled at a later stage by the operation of movement rules(substitution).

Let us reanalyze the Passive from this perspective. One is led to regard it as a sequence of two NP movements, each of which is structure preserving. First, if there is a lexical subject it moves into a base-generated PP, headed by the preposition *by* (the Agentive *by*-phrase). The position of an NP inside a PP is surely a base-generated position, as can also be seen in the following examples. This step is usually referred to as Subject NP Post-Posing (see (97c)).

    (96)   a. The window opened by chance.
             b. The window was opened by John.

The second, obviously structure preserving, NP movement is the movement of the object into the empty subject position. This movement, called Object Preposing, is illustrated in (97d). The advantage of having decomposed Passive into two simpler

movements is, that now, the similarity of Passive and Passival Construction (e.g., (18,19) above) can be formally expressed by saying that both involve Object Preposing.

(97)   a.The car was driven to London by John.

b.

```
              S
      NP ─────────── VP ──────────────────────────────── PP
      |    Aux ──────────── MV ──────────            P ──── NP
     John   T   be-en   V ───── NP    PP             by    [ ]
                       drive  the car  to London
```

c.

```
              S
      NP ─────────── VP ──────────────────────────────── PP
      [ ]   Aux ──────────── MV ──────────            P ──── NP
            T   be-en   V ───── NP    PP             by    John
                       drive  the car  to London
```

d.

```
              S
      NP ─────────── VP ──────────────────────────────── PP
   The car  Aux ──────────── MV ──────────            P ──── NP
            was      V ───── NP    PP             by    John
                   driven  t    to London
```
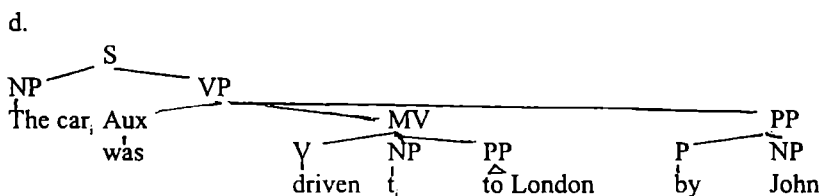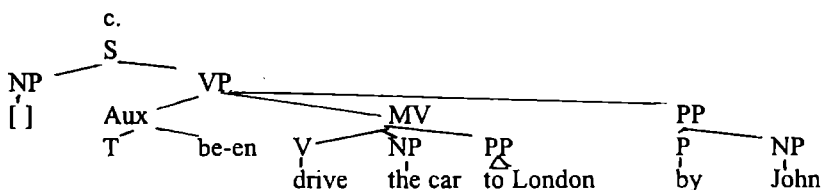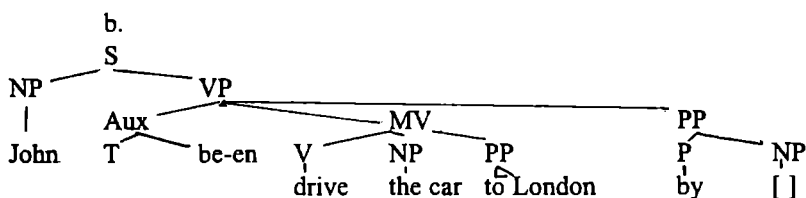
As an example of how phrase structure considerations may modify assumptions about derived structure, let us examine Subject-Aux Inversion and try to establish the position that the auxiliary verb occupies in derived structure. Observe the following paradigm.

(98)   a.He has come.
        b.I believe [$_S$' that [he has come]].
        c.I wonder [$_S$'whether [he has come]].
        d.Has [he come] ?
        e.*I wonder [$_S$' whether has [he come]].

The examples show that one cannot have both a lexical COMP *(whether)* and an inverted Aux *(has)* at the same time; ((98e) is ungrammatical. Sentences (98b-d) suggest that the inverted Aux is in complementary distribution with the lexical complementizers; therefore, the Aux can plausibly be assumed to occupy the position of

lexical complementizers in derived structure. On the strength of such evidence, we will assume that the Aux is in COMP position in inversion structures like (98d).

(99)　　a.

```
              S'
          ╱        ╲
      COMP          S
      ⎧ that  ⎫   NP      VP
      ⎨       ⎬   he   Aux    MV
      ⎩whether⎭        has    come
```

b.

```
              S'
          ╱        ╲
      COMP          S
      Aux   NP           VP
      │           Aux     MV
      has   he    t       come
```
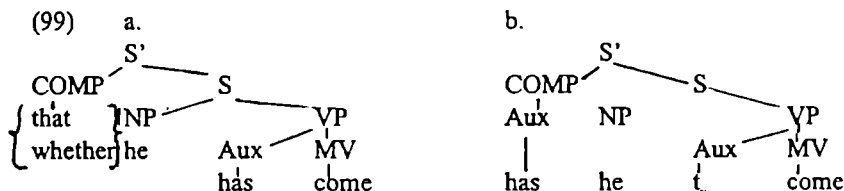
But then what is the exact position of wh-words, since while wh-words and lexical complementizers do not co-occur, wh-words and auxiliaries do co-occur; in fact not only wh phrases, but also other phrasal constituents may precede inverted auxiliaries, as examples in (100) show.

(100)　　a. [To whom$_{PP}$] had he been reading those stories?
　　　　　b. [Never before$_{AvP}$] had he seen such a girl.
　　　　　c. [Only in London$_{PP}$] could you see the like of this.

This suggests that wh-phrases (and all the phrases) that have the same distribution occur in a higher position, that we will call the Specifier-of Complementizer (Spec) position, anticipating later discussions. Then the PSRs rules given in (63) are enriched as in (101), and the derived structure of (100a) is as in (102) below. All the results about wh- Movement are, of course, unaltered.

(101)　　$S'' \rightarrow Spec COMP ̂ S'$
　　　　　$S' \rightarrow COMP ̂ S$
　　　　　$S \rightarrow NP ̂ VP$

Thus, the Structure Preserving Constraint drastically limits the class of admissible derivations. It embodies the claim that PSRs define *a range of possible configurations* and possible syntactic positions, which cannot be changed and constitute the formal skeleton of the grammar. What varies are the constituents that fill those positions. The structure Preserving Constraint has a great deal of "naturalness" about it, since it relieves the burden of learning "derived structures"; derived structures are not essentially different from basic structures. Emonds (1976) assumes however that only cyclic rules, i.e., rules that affect both embedded clauses and main clauses are structure preserving. Main clauses or *root clauses*, as he calls them, may also undergo transformations that are not structure preserving (e.g., Left Dislocation, discussed in (25,(26), above).

These are some of the most significant results in the theory of transformations, obtained before the advent of the Government and Binding Theory, with Chomsky's Pisa Lectures (1981).

(102)

```
              S''
         ___/‾‾‾‾‾\___
  Spec COMP            S'
  PP              ___/‾\___
  To whom,    COMP        S___
              had    NP‾‾‾/‾‾\‾VP___
                     he    Aux    MV
                          been  V‾‾‾NP‾‾‾‾‾‾‾‾‾PP
                             reading those stories  t_i
```
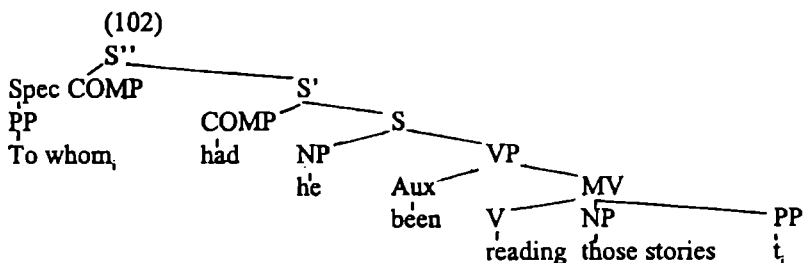
7. The organization of a generative grammar

In the preceding pages we insisted that it was for formal reasons having to do with the accuracy of syntactic description that the Grammar postulated an abstract level of analysis that was called the deep structure. The deep structure was conceived of as a formal syntactic representation, able to show the correct constituency and the correct functional information about a sentence.

But constituency and functions are also essential for the semantic interpretation of the sentence. Consider again pairs like *John is eager to please./ John is easy to please,* where the syntactic function of the NP *John* with respect to the verb *please* is an essential aspect of the meaning of the two sentences; it was assumed that these functions were correctly indicated in the underlying structure. It looked as if, as one got, from top to bottom, following the steps of a derivation (from SS to DS), one moves in a direction of increased semantic transparency. The underlying structure appeared to be closer to the meaning of the sentence, containing all the structural information necessary for semantic interpretation. Transforamtions were regarded as meaning preserving, as already explained.

```
                                    Semantic Component
                Base Component → DS
(103)   Syntax
                Transformational Component→ SS
                                    Phonological Component
```
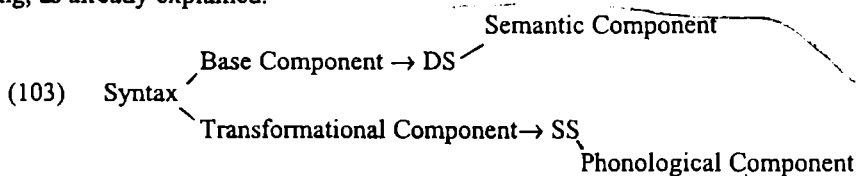
Therefore, a natural solution was to let the interpretative semantic rules directly operate on the underlying structure which was more relevant in this respect. The standard organization of many transformational grammars (e.g., the standard 'Aspects' model of generative transformational grammar, Relational Grammar, a. o.) is as given in (103). In this model, syntax is the generative source of the grammar, producing the DS and ultimately the SS. The Semantic and the Phonological components are interpretative. The Semantic Component operates on the DS and assigns a reading to the sentence. The Phonological Component assigns sentences their phonological representation.

The early seventies witnessed an important progress in semantic studies, which is undoubtedly due to the cooperation between linguists of the generative semantics persuasion and logicians. Linguists become more and more aware of the fact that an adequate semantic representation of a sentence was going to be a representation of that sentence in the formalism of predicate logic. In predicate logic, the *domain* of the various logical operators, determined by *their linear order* is all important. Consider the contrast between (104a,b) below, involving a difference in the relative scope of the existential operator ('∃xF' = there is one x such that Fx) and the universal operator ('∀xF' = For all x /for every x, Fx).

(104)   a. ∀x ∃y father (y, x)
         For all xs, there is some y such that y is the father of x.
         Everybody has a father.
         b. ∃y ∀x father (y, x)
         There is some y such that for all xs, y is the father of x.
         Somebody is everybody's father.

The two formulas express very different thoughts. The study of natural languages from this prespective revealed the importance of linear relations in the interpretation of sentences, precisely because linear, *precedence,* relations determine the interpretation of semantic operators, i.e. of words like quantifiers, negation, modal adverbs, interrogative pronouns and many more. But transforamtions reorder constituents and may therefore modify the interpretation of these operators by modifying their relative scope.

To illustrate this important idea, we will quote a few pairs of examples involving the application of Passive, which was assumed to be a meaning preserving rule, as in examples (105). Yet examples (106) - (108) are not synonymous.

(105)   The boy threw the stone.
         The stone was thrown by the boy.

(106)   a. Many arrows didn't hit the target (...but many did).
         b. The target wasn't hit by many arrows (...*though many arrows did hit the target).

(107)   a. Everybody in this room speaks two languages.
         b.Two languages are spoken by everybody in this room.

(108)   a. The tribe willingly sacrified Harry.
         b. Harry was willingly sacrified by the tribe.

In the first two examples(106,107), what counts is the relative order of the underlined operators (quantifiers vs. negation,). In the last case the modal adverb

willingly may refer only to the subject in (108a); but it may refer to the subject or to the *by* - phrase in (108b), since *willingly* is releated to any constituent that may be interpreted as an Agent, and in (108b) both *Harry* and *the tribe* have Agent properties.

The picture which emerges is more complex. Some aspects of the meaning of a sentence (syntactic functions, constituency, a.o.) are determined at the level of the DS. Other semantic properties of the sentence (e.g., the scope of the operators) are determined only after reordering rules have operated, i.e., they are determined at the level of the SS. One is led to conclude that: (a) Semantic interpretation rules should operate *after movement rules*, i.e., they should operate on S-Structure representations. (b)At the same time, one should find formal means of conserving up to the level of S-Structure those aspects of the underlying structure which are semantically relevant, e.g., the information regarding constituency and underlying syntactic functions. It is to this aim that *traces* are left behind indicating the initial position of constituents, a position which may be semantically relevant. More technically, a *trace* is a syntactic category (such as NP) that has been voided of phonological content and internal structure, retaining only an index that is identical to the index of the material that was moved out of the trace position.

As an illustration of these points, consider again the D-Structure and S- Structure of *The car drives well* [The term S-Structure, rather than 'surface structure' stresses that we are dealing with an abstract representation, enriched with traces, different from the actual 'surface' sentence. The term D-Structure is correlatively used].

(109)   a.   D - Structure
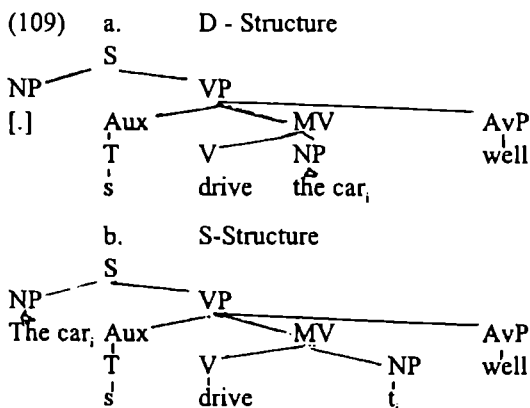
b.   S-Structure

Notice that the S-Structure is semantically more relevant since more aspects of the meaning of the sentence can be derived from it than from the D-Structure. Thus, the D-Structure shows the important fact that the NP *the car$_i$* is the object of the verb *drive*. But this information is indicated by the coindexed trace t$_i$ in object position at the

_S-Structure level. At the same time, the derived subject role of the NP is relevant for the semantics of the sentence, since the adverb *well* characterizes the properties of the subject, as seen by comparing *The car drives well* with *John drove the car well*. So, the S-Structure is semantically more relevant.

The organization of the grammar has changed, allowing movement rules to operate before semantic interpretation, while other rules (e.g., some deletion rules) will operate in the phonological component. The overall organization of the grammar at the GB stage of its evolution is as follows:

(110)   D - Structure

                                      |

                              Move α [Affect α]

                                      ↓

                              S - Structure

Phonological Component   Logical Form
                                                (Semantic component)
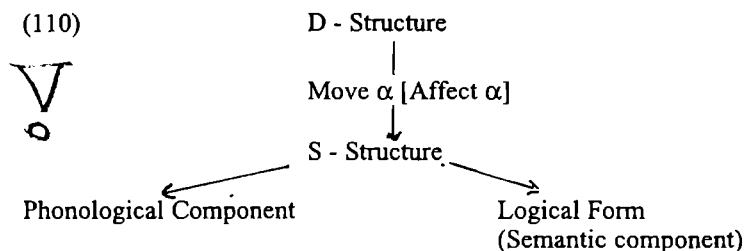
The S-Structure has become the input of both the semantic component, called "Logical Form" and the Phonological Component. We will not be dealing with the Phonological component in the pages of this course. Some consideration will be given, however, to Logical Form and to the mapping of S-Structure on Logical Form.

Chapter 4

THE LEXICON. SUBCATEGORIZATION

1.The problem.

In the preceding chapters, we have developed a set of rule schemata which constrains the types of PSRs a language may have. These rules are stated in terms of grammatical and lexical categories (NP, N, AP, A, etc.); no particular attention was paid to the information contained in individual lexical items. When all the grammatical categories have been rewritten as lexical categories, lexical items are introduced by means of *context free lexical insertion rules* which simply replaced lexical categories by lexical formatives N → *boy*, V → *run*, V → *put*, P → *on*. The way in which a lexical item fits into the syntax is indicated by a single symbol, *the lexical category symbol*, which appears to the left of the arrow in the rule that introduces the item. Therefore, only categorial information was considered relevant for the functioning of grammar. Except for their categorial feature (*run:* [+V], *boy:* [+N], etc.), lexical items were treated as unanalyzed atomic entities. This view of the relation between the lexicon and the syntax is characteristic of the earliest GTs (i.e., LSLT and Syntactic Structures).

This treatment of the relation between grammar and lexicon was untenable, however, because it ignored the obvious fact that the combinatorial abilities of lexical items belonging to the same lexical category vary quite considerably; because of this, there are severe contextual restrictions on the insertion of lexical items, which are not interchangeable, even when they belong to the same lexical category. Consider the following example, in which PS grammar has produced PM(1), and suppose we dispose of the lexical insertion rules in (2); the grammar may derive a lot of sentences, both grammatical (examples (3)), and ungrammatical ones (examples (4) and (5)).

(1)
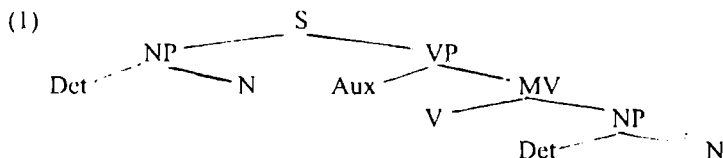
(2)   V→elapse, read, send, put, rely
        N→boy, Bill, milk, girl, book, table
        Det →the, a

(3)   a. The boy bought a table
        b. The girl read a book.

(4) a*. The boy elapsed a table.
   b*The girl relied the boy.
   c**The milk elapsed a table.
   d*The Bill read a book.

(5) a.*The table bought a boy.
   b.*A book read the girl.

The sentences in (3) are well-formed, those in (4) and (5) are clearly ill-formed, though produced by the same rules. These examples show that lexical items should be inserted only in the appropriate contexts in a sentence, and that a descriptively adequate grammar needs some mechanism which provides information regarding the contextual restriction on the insertion of lexical items. A cursory examination of the examples suggests that the information regarding an item's combinatorial ability is local, that is, it can almost always be stated in terms of the item's close neighbours, usually its sisters. For instance, in (4d), the proper noun, *Bill*, should not have a determiner; the verb *rely* in (4b) should take a prepositional phrase as complement [*relied* $_{PP}$[*on the boy*], not simply an NP [*rely* $_{NP}$[*the boy*]].

In "Aspects of the Theory of Syntax" (1965), the book that defined the format of generative research in the sixties and seventies, Chomsky proposed that the function previously fulfilled by PSRs should be divided into two: a) context free categorial rules which show the constituency of phrases; b) context sensitive rules which analyse lexical categories, converting them into sets of syntactic and semantic features. These rules account for the distribution of lexical items in the given phrase structures. Because these rules partition *categories* into subsets of them, they are called *subcategorization rules*. A different conception of the lexicon is now presupposed; while previously lexical constituents were represented as *atomic symbols* with no internal structure or natural classification, in the theory of "Aspects", lexical categories are viewed as structured entities called *complex symbols*, composed of more elementary units called *features*; loosely speaking, complex symbols are sets of syntactic and semantic features.

We will briefly examine the form of *subcategorization rules* and of the *complex symbols* in the lexicon in the 'Aspects' model. Subcategorization rules are further subdivided into *strict subcategorization rules* and *selectional rules*. Strict subcategorization rules are narrowly syntactic, they analyze a lexical category in terms of its *local distributional contexts*, in terms of the 'frames' where it can be inserted; these frames or contexts of occurrence are stated in terms of grammatical (and lexical) categories. Selectional rules analyse a lexical category in terms of its inherent or contextual semantic features.

2. Strict subcategorization rules and features.

A few verb subcategories in English. As already mentioned, strict subcategorization rules indicate the local context in which a particular subcategory of category A can function. The idea of 'local context' of insertion of an item can be

expressed more formally by saying that strict subcategorization frames indicate the sequence of sister grammatical categories that the analyzed lexical category occurs with, within the *first phrase that contains* the analyzed lexical category. For instance, since the lexical category verb is contained in the category MV (and introduced in derivations by rules of the form MV →... V ...),the verb's frames of subcategorization are given with respect to its sister categories inside the MV (the number and types of objects the verb takes). Furthermore, complex symbols, i.e., lexical categories, are introduced in the derivation by rules of the form A→CS (e.g., V→CS, N → CS), which spell out the various properties of a given lexical category. Thus, assuming that the grammar contains some PSR like (6a), which introduces the lexical category A in the derivation, the general form of a strict subcategorization rule for A is (6b).

(6)   a. $\delta \rightarrow \alpha A \beta$

b. A → CS/ α - β, where $\alpha A \beta$ is of category δ, and δ is the category that appears on the left in the rule $\delta \rightarrow ...A...$, which introduces A.

This rule says that an item A can function as a complex symbol (i.e., can be introduced) only in derivations where it is inserted between α-β. To give more flesh to the notion of strict subcategorization, let us examine a few verb subcategories in English. A basic distinction that the grammar formalizes is that between *transitive verbs*, those which appear in the immediate context of an NP (=7b), and intransitive verbs, those which need no (non-prepositional) object to form a well-formed sentence (7a):

(7)
V → CS/-- #   V → CS/ -- NP
V: {elapse, bark, bleet, chirp...}   V: {discern, close, love, open..}

Another month has elapsed.   He cannot cut the bread.
Birds chirp.   He loves music.

Notice the parallelism between transitive and intransitive predications in the rules below:

(8)
V → CS/ -- PP   V → CS/ -- NP PP
V: {brag about, look at,   V: {charge smb with, inform smb of,
rely on, look for....}   absolve smb from, rob smb of....}

He bragged about his conquests.   They charged him with first degree murder.
They looked for the child.   They informed her of their arrival.
*He relied.

(9)
V → CS/--$\left\{ \begin{array}{l} \text{AvP} \\ \text{PP} \end{array} \right\}$ [+Manner]   V → CS/ -- NP$\left\{ \begin{array}{l} \text{AvP} \\ \text{PP} \end{array} \right\}$ [+Manner]
              [+Time]   [+Time]
              [+Place]   [+Place]

V: {act, behave, last, lie,...}   V: {treat, stand, put, lay,...}

He behaved well   He treated her well/with care.
It lasted long/for a day.   He stood it there/in the corner.
He was lying there/in bed.   He put it there/on the desk.

(10)
V→CS/ -- PP ⌃ PP   V → CS/ -- NP ⌃ AP
V: {argue with smb about smth,   V:{paint, hope, kick, slam...}
agree with smb on smth...}

They argued with us on it.   He kicked the door open.
                                   They really painted the town red.

We have so far subcategorized verbs only function of their NP and PP complements. Many verbs in English may or must take subordinate clauses as complements: *He believes$_s$ [that$_s$ [he will win]]; He wonders [whether [he will win]]. That [he will win and] and [whether [he will win]]* are complement clauses (roughly, subordinate clauses that may function as subjects, objects). A complement clause is structurally more complex than a main clause, since it contains an introductory subordinating element, e.g., *whether, that*, called *complementizer*, which heads the complement clause. Using the symbol S' for complement clauses, the following PSR will derive complement clauses: S' → Comp S [*He hopes* $_s$[[$_{COMP}$ *that*]]$_s$ *he will win*]$_s$]$_s$]$_s$ Here are a few verb subcategories that select complement clauses:

(11)

V→CS/ -- S'
V: {believe, know, think, declare, assert,...}
I know that he will succeed.

(12)

V →CS/ ---PP⌃S'   V→---NP⌃S'
V: {argue, agree...}   V: {inform, persuade, convince...}

They argued with us that   They informed me that I was late.
they were innocent.
They agreed with us that it   They persuaded me that he was right.
had been a mistake.

1.2. Strict subcategorization features. The rules mentioned above are part of the base component (and of derivations, therefore). At the same time, each of these rules *defines a feature* that characterizes some verb subcategory; a subcategorization feature indicates the (minimal) frame in which some lexical item is allowed to be inserted. The subcategorization *features* are in the *lexicon*, as parts of an item's lexical

entry. Here are examples: the first feature is the categorial one, the second is the subcategorial one.

(13) eat   rely   chirp   inform
      read   depend   bark   charge
      [+V]   [+V]   [+V]   [+V]
      [+ -- NP]   [+ -- PP]   [+ - #]   [+ -- NP⌐PP]

Strict subcategorization features are syntactic; remember that a feature is syntactic when it mentions a distributional context/ property. Having examined the examples, we are in a position to give some of the important properties of subcategorization rules and features.

1) Subcategorization rules *take into account DS contexts*. These contexts may be modified by transformations. There are, for instance, transitive verbs that may be used absolutely, because their object is deleted or phonetically null; compare:

(14) a. He was writing a letter.   a'. He was writing ..
      b. He likes music.   b'. *He likes.
      c. He is still breathing.

The surface context of *write* in (14a') is the same as that of the intransitive *breathe*. Yet, the verb *write* continues to be transitive, as shown by the possibility of asking *What was he writing* , compared to the impossibility of *What was he breathing*.
    2) Subcategorization takes into account the first phrase that contains the analysed category: it is local. In our analysis we have taken into account MV constituents, those which are selected by a particular verb and are essential for the syntactic and semantic well-formedness of any sentence containing that verb. On the other hand, there are many sorts of constituents, such as locative and temporal PPs or adverbs, manner adverbs, etc., whose occurrence is neither required nor excluded by the choice of a particular verb.

(15)   a. He obviously relied on her in the past.
          b. He obviously relied on her.
          c. He relied on her.
          d. *He relied.

(16)   a. He [saw her]$_{MV}$[yesterday]$_{AvP}$
          b. He has been [waiting for her]$_{MV}$[for three weeks]$_{PP}$
          c. He had [decided on the boat]$_{MV}$[on the train]$_{PP}$

In terms of the "Aspects" formalism, this difference appears as the distinction between MV constituents. and adjuncts outside the MV, apparent in the following PSR: VP -→ Aux⌐MV⌐PP/AvP. Notice the analysis of the examples (16), illustrating this rule.

3) Strict subcategorization features (and rules) are finite in number. The range of possible subcategorization features is entirely determined by PSRs. Strict

subcategorization rules/features are typical examples of syntagmatic relations, relations *in praesentia.*

4) Strict subcategorization features are not entirely predictable from the meaning of an item. Nearly synonymous verbs in one language (e.g., *await, wait for* in English) may exhibit different frames; translational equivalents may also have different subcategorial features (e.g., *wait* [-- PP] vs. *a aştepta* [-- NP]).

This is why strict subcategorization pertains to the formal / syntactic meaning of an item; a subcategorization feature indicates *a mode of construction* for a syntagm/sentence containing the respective lexical item. Knowledge of the subcategorization frame is an essential aspect of one's knowing a word, likewise words of a foreign language are best learned and taught in a minimal syntagm, which is precisely the item's subcategorization frame.

(17)

```
              S
     NP              VP
        Aux              MV
           V...
```
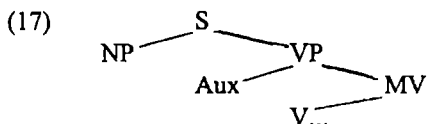
Remark. Notice that verbs are subcategorized in terms of the number and types of objects they take; the subject is not mentioned; first, the subject is external to the MV phrase which introduces the lexical category in the derivation [see (17)]; secondly, the subject is obligatorily present in a sentence being one of the major immediate constituents of the sentence S→NP⌢VP.

(5) Strict subcategorization applies to all parts of speech (see below).

3. Selectional rules and selectional restriction features.

Selectional rules introduce semantic features in the description. Some semantic features are inherent and characterize the meaning of a given item without reference to a context: *water* [+liquid], *milk* [+liquid], *teacher* [+Person], *realize* [+achievement], etc. Other semantic features are contextual. They impose limitations on the semantic context where an item can be inserted. These contextual features refer to the combinatorial power of the lexical items and are of more interest to the grammar. These are the so-called *selectional restrictions.* Again, we are dealing with *rules* as part of derivations, and also with selectional *features* as part of the lexicon. Selectional rules apply after strict subcategorization rules and further refine the partition of verbs, nouns, etc. achieved by means of strict subcategorization; they do this by progressively introducing inherent and contextual semantic features, thus· converting the frame of grammatical categories into a frame of semantic features.

Here are examples of selectional restriction rules for verbs. Notice that the verb imposes semantic constraints on both its subject and object. While the PSRs provide a subject for each VP, they make no provisions as to the semantic features of the noun functioning as subject, which is why the semantic properties of the subject need to be specified by selectional rules/features.

(18)   a.eat → CS/ [+Animate]_NP----[+edible]_NP
         b.assert → CS/ [+Animate,+Person]_NP----[Proposition]_s·

On the basis of such rules, we define selectional features, the famous
selectional restrictions; in the "Aspects" model, selectional restrictions are part of a
predicate's lexical entry. In the lexical entries below a notational distinction was
observed between the inherent semantic features of an item (e.g., *believe* (+state), *idea*
(+abstract) and its contextual features (selectional restrictions), i.e., the semantic
constraints it imposes on the neighbouring items; the selectional restrictions are
enclosed between angular brackets (cf. Katz (1963)).

(19)   a. eat
         [+V]
         [+ --- NP   ]
         [+ (accomplishment)]
         [+ <[(+Animate)]_NP -- [(+edible)_NP]>

         b. assert
         [+V
         [+ ---   S
         [+(event)]
         [+ <[+animate, personal]_NP -- [proposition]_s· >

The following properties of selectional rules/features should also be mentioned.
    1) One of the two categories which contract the selectional relation is said to
be *selectionally dominant*, which means that this category transfers its inherent
semantic properties on to the category it combines with, ensuring a certain *semantic
congruence* of the construction. It is currently assumed that predicates (i.e., verbs,
adjectives) are selectionally dominant, imposing restrictions on their objects and
subjects, securing the semantic coherence of the whole predication. In more recent
terms (cf. Chomsky, (1981), predicates are said to s-select their arguments (where
"s-selection" means semantic selection).
    2) While strict subcategorization features enumerate admissible sequences of
lexical categories, selectional restrictions deal with selecting members belonging to the
specified lexical categories. Given a V NP sequence and some verb which is [-- NP],
selectional features determine a paradigmatic set of nouns that may be objects of that
verb. Hence, selectional rules establish paradigms of semantically compatible items in
an "either-or" relation. They are best viewed as means of establishing *paradigmatic
relations, in absentia*, and paradigmatic classes (cf. Bruck,1978).
    3) Since selection involves *semantic features,* and the range of relevant
semantic features is potentially vast, if not infinite, the set of rules introducing semantic
features is not finite and these rules have not been stated with any accuracy in the
literature, in spite of considerable efforts to do so in the late sixties. Indeed, attempts to
precisely state selectional restrictions are doomed to failure, given the pervasiveness of
metaphor, and generally of figurative meanings in natural languages. Sentences which

blatantly violate selectional rules and ought to be ruled out for semantic reasons may become meaningful (i.e., interpretable) if they are embedded in a sufficiently large discourse. Jakobson must have been greatly amused when he proved that Chomsky's paradigm example of meaningless sentence *Colourless green ideas sleep furiously* could be shown to be frought with poetic meaning, in fact.

The place of *selectional rules* - i.e., of a mechanism which guarantees the semantic congruence of phrases/sentences - is in the semantic and pragmatic components of the grammar. In the remaining of this book, we will use the term 'subcategorization rule/feature' *only* to designate strict subcategorizataion rule/feature.

4. The lexical entry and lexical insertion in 'Aspects'

Part of knowing one's language is possessing a vocabulary or list of words. This list of words is called a *lexicon* and it consists of a set of entries, one for each word or rather formative. The lexicon is part of the base component of the grammar.

Grammatical formatives are simply listed in the lexicon with their phonological matrix. They appear in the rules of the grammar. The lexical entry of a *lexical formative* is more complex; a lexical item is described as a complex symbol offering the following types of information about an item:

a) *The phonological information* about an item takes the form of a phonological matrix; e.g., *cat* /k æt /.

b) *The morphological information* may indicate that a certain noun or verb is irregular, whether a certain formative is a free or a bound morpheme, etc.

c) *Semantic information* - i.e., information about a word's (descriptive) meaning may be viewed, for the time being, as a set of (inherent and contextual) semantic features which are true of the referent of that lexical item: *bachelor* [+male] and [+adult] and [married]. As research into semantics advanced, the format of semantic description has changed considerably and has come to be more structured than a mere set of features (see Jackendoff 1983, 1987, Putnam 1975 a.o.), but this is not the object of our discussion now.

d) We have a considerably better understanding of *the syntactic information* that should figure in a lexical entry; this information has the form of a set of syntactic features, necessarily including a *categorial feature* (e.g., +N, +V) and one or more than one *subcategorial features* (e.g., [+ - NP]), as shown above. In addition, as long as grammars were conceived of as systems of rules, it was sometimes necessary to indicate in the lexicon that a certain item did fall under the application of a particular lexically-governed rule; this was done by means of a *rule-feature*. The lexical entry for *come* may contain the rule feature [+There - Insertion], showing that a sentence like: *There came a girl* is possible.

The lexicon is nothing but a more systematic and complete dictionary. When one thinks of the lexicon vs the grammar certain differences immediately come to mind.

The grammar expresses the regularities of a language, the lexicon is the repository of what is exceptional and idiosyncratic in a language (the part that has to be learned).

Psychologically, the lexicon is a more tangible entity than that grammar, because speakers are aware that they know and use words, but they are hardly aware that they know and use rules of the grammar. It would increase the plausibility of the grammar if it somehow made the best of the information contained in the lexicon.

4.1. At last we are in a position to present the last stages in the generation of a DS in an "Aspects" grammar; such a generation proceeds through a sequence of types of rules, starting with PSRs. As the derivation progresses, subcategorization and selectional features are inserted under the lexical category symbols, through the application of subcategorization rules, which form and expand the complex symbols. The last step is *lexical insertion*; lexical insertion inserts, for each complex symbol in the preterminal string, a lexical formative whose complex symbol is not distinct from that of the given complex symbol. (Two complex symbols are not distinct if there is no feature which is positively specified in one symbol and negatively specified in another. Thus, if the preterminal string of some PM has a symbol CS [+N, +Det---, +Common, +Human], we can substitute for it any item in the series: *boy, man, teacher,* a.s.o. which is characterized by the same matrix of syntactic and semantic feature. Here is an example.

```
       (20)
         S
 NP ─────┴──── VP
 N              Aux ─────────── MV
 [+N[            T    M        V ──────────── NP
 [+ - # ]        ed   may      [+V]        Det ───── N
 [+Common ]                    [+ - NP]    [+Det]    [+N ]
 [+Abstract]                   [+accomplishment]that [+Det-- ]
                               [+<[Abstract] --]      [+Common]
 sincerity                     +--[Animate]_{NP} >]   [+Animate]
                                                      [+Human]
                               frighten               [+Male]
                                                      [-Adult]
                                                      boy
```
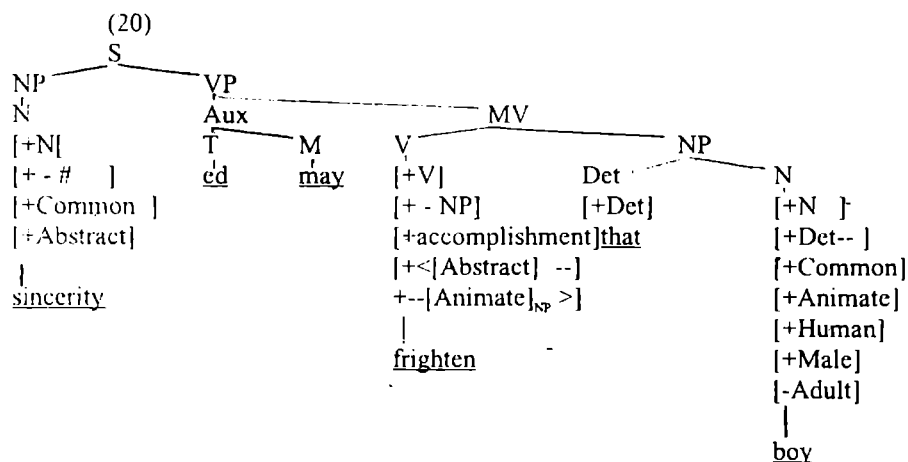
4.2. A more technical result. English is a context-sensitive language. Grammars are formally classified in terms of the kind of rules they contain, and the languages generated by these grammars can likewise be classified in terms of the types of rules that generate them.

It has been shown (Kimball, 1972) that context sensitive (=CS) grammars have greater generative capacity than context free (=CF) grammars, since there are languages generable by CS, but not by CF, grammars. At the same time, it is immediately obvious that CF grammars are a subset of CS grammars. As shown in 2.

above, a CS grammar typically has rules of the form A →B/X-Y (the canonical form of subcategorization rule). If we simply let X and Y be null for all the rules, we obtain rules of type A → B, that is, CF rules. Since subcategorization rules are required in the grammar of English, we may conclude that English is not a context free, but a context sensitive, language.

### 5. Two exercises in subcategorization

In the last section of this chapter, we will present a few more interesting examples of subcategorization. The purpose of these descriptions is, on the one hand, to provide data for future generalizations, and, on the other hand, to introduce some of the puzzles that may arise in the description of various languages, as well as to illustrate the kind of answers to such problems that this framework can provide. Now and in later chapters, data from other languages than English (and Romanian) will be brought in, both because some linguistic property is not so clearly manifest in English or Romanian, and because it is interesting to prove that a theory that claims universality is really applicable to the data of more than one language.

5.1. A second look at transitivity: Unergative, Transitive, and Unaccusative verbs.

The familiar distinction of transitivity means to distinguish between verbs with one obligatory argument, the subject, therefore, verbs that occur in the configuration NP - #, and verbs that minimally need two arguments for a well formed predication, verbs which occur in the configuration NP - NP . Recently, researchers have become increasingly aware of a clear lack of homogeneity in the behaviour of intransitive verbs (cf. Perlmutter (1978), Hoeckstra (1989), Burzio (1986), Grimshaw (1990) a.o.). What happens is that the distributional properties of the intransitive verbs show that their unique argument sometimes behaves like a subject, while other times it behaves like a direct object, so that the behaviour of this latter class of intransitive verbs is similar to the behaviour of transitive verbs. Taking advantage of the existence of two levels of syntactic description (D-Structure, S-Structure), the hypothesis was made that for the first class of intransitive, also called *unergative intransitives* or simply *unergatives,* the unique argument is a subject in the D-Structure, as well as in the surface, in a configuration like (21a). For the class of intransitives that share some of the properties of transitives, also called *unaccusative intransitives* or *unaccusatives,* it may be assumed that their unique argument starts out as a direct object, in the configuration (21b). These verbs then share the subcategorization feature [- NP] with transitives, and this accounts for their similarity. The name "unaccusative" suggests that these verbs cannot assign the Accusative case, this is why their underlying object ends up being a subject; i.e., it is assigned Nom case, it determines verb agreement, it may or must move to subject position. The binary transitive/intransitive contrast is replaced by a tripartite division into unergative, unaccusative, and transitive.
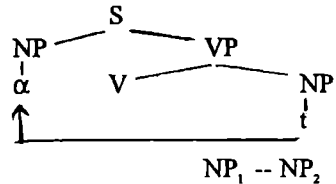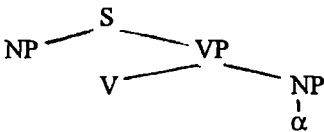
(21)   a. unergative intransitive   NP--

```
        S
NP  ---------  VP
 |
 α
```
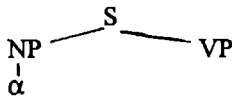
b.   unaccusative intransitive (ergative)   -- NP

```
        S                                    S
NP  --------- VP              NP  --------- VP
      V --------- NP           |
                   |           α    V --------- NP
                   α           ↑                 |
                               |_____ t
```

c.   transitive   NP₁ -- NP₂

```
        S
NP  --------- VP
 |
 α    V --------- NP₂
                   |
                   β
```
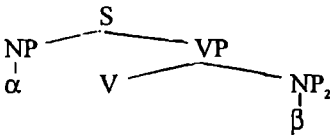
A variety of grammatical processes that systematically distinguish unaccusative verbs from unergative verbs is now well documented in a wide range of languages, Romance and Germanic languages included. The facts that will be quoted come from Dutch, Italian and, when possible, from English and Romanian. It is worth mentioning that the unaccusative/unergative behaviour of a verb is not predictable from its meaning, at least not with any accuracy. Here are a few English examples:

(22) *unergative verbs*: cry, cough, exercise, fly, laugh, run, swim, etc.
unaccusative (ergative) verbs: burst, collapse, fall, come, appear, swell, vanish, etc.

The most we can say is that the unergative/unaccusative difference correlates with event types: unaccusative verbs tend to be change-of-state verbs, while unergatives tend to be activities; yet, this characterization is not very reliable, since the aspectual class of a verb considerably depends on its use in a particular type of sentence. The distributional differences between the two classes of intransitives are much sharper.

3.1.2. In languages like Dutch, German, Italian, a.o. the distinction between unaccusative and unergative predicates is manifested in the choice of the perfective auxiliary. Unaccusative predicates select G. *sein/* D. *zijn/* I. *essere*(=be), while unergatives select G. *haben/* D. *hebben/* I. *avere*(=have) just like transitive verbs.

(23)   Dutch.   a.dat Jan valt
                  that Jan falls
                  b.dat Jan gevallen is
                  that Jan fallen is

Italian. a. Giovanni arriva
Giovanni arrives
b. Giovanni e arrivato
Giovanni is arrived

(24)   Dutch   a. dat Jan lacht
that Jan laughs
b. dat Jan gelachen heeft
that Jan laughed has
Italian   a. Giovanni telefona
Giovanni telephones
b. Giovanni ha telefonato
Giovanni has telephoned

(25)   Dutch. a. Ik heb het verhaal gehoord
I have the story heard
b. dat ik het verhaal gehoord heb
that I the story heard have
Italian. a. L'artigleria affondo due navi nemiche
The artillery sank two enemy ships
b. L'artigleria ha affondato due navi nemiche
The artillery has sunk two enemy ships

The similarity between unaccusative and transitives follows from their sharing a subcategorization feature [- NP]. However, it is not a coincidence that in languages like Italian or Dutch, unaccusatives select in the perfect the same auxiliary that is used to form the passive: I. *essere*/ D. *zijn*.

(26)   Italian. Passive   Maria e stata accusata
                                    'Mary has been accused.'
Unaccusative in the perfect   Maria e arrivata.
                                    'Mary has arrived.'

Passive and unaccusative constructions also share one property; in both cases, the subject is a former object. Thus, auxiliary selection is structurally motivated.

3.1.2. A second fact refers to ability of using a verb's past participle as an adjective. In English, Dutch, Romanian, etc. past participles of transitive verbs can normally be employed as adjectives. Here are a few examples:

(27) English. A broken promise, a well-cut coat, a beaten child, the torn shirt, a better educated person, the written word, the oppressed people, the enforced restriction, the newly published edition, etc.
Romanian o promisiune călcată, o haină bine croită, un copil bătut, o cămaşă ruptă, cuvântul scris, poporul asuprit, etc.

The past participles of intransitives behave in a non-unitary fashion, some can, and some cannot, be used as adjectives. Past participles of unergatives are not used as adjectives, while unaccusative verbs allow the adjectival use of their past participles. Here are illustrations; Dutch examples will be provided first, in order to relate this property to the preceding one (perfect auxiliary selection).

(28)   a.de kinderen zijn jong gestorven (unaccusative verb)
        The children are young died
        b.de jong gestorven kinderen (adjectival participle)
        the young died children

(29)   a.de kool is sneel gegroeid (unaccusative verb)
        the cabbage is fast grown
        b.de sneel gegroeide kool
        the fast grown cabbage

(30)   a.de man heeft gelachen (unergative verb)
        the man has laughed
        b.*de gelachen man
        the laughed man

(31)   a.de kinderen hebben gedanst (unergative verb)
        the children have danced
        b.*de gedanste kinderen (the adjectival use of the participle)
        the danced children

In English too, the -ed participle of certain intransitive verbs can also be converted into an adjective. An examination of the intransitive verbs which may undergo this process reveals that they are unaccusative verbs. Compare the participles in (32a), which are derived from unaccusative verbs, with those in (32b), which are derived from unergative verbs.

(32)   a. a wilted lettuce, a fallen leaf, a collapsed tent, burst pipes, rotted
        railings, swollen feet, vanished civilizations, newly-arrived customer
        b. *a run man, *a caughed patient, *a swum contestant, *a flown pilot,
        *a cried child, *a laughed clown

In Romanian, even if one keeps out of the class of intransitive reflexive verbs for the time being, contrasts like those in (33a-b) are still to be found..

(33)   a. (unaccusative) om veşnic plecat, scrisoare recent sosită, musafir
        abia venit, copil adormit
        b. (unergative) *copil dormit, *clovn râs, *om respirat (compare: aer
        respirat, based on the transitive verb)

As to the interpretation of these facts, the hypothesis that unaccusatives and transitives have underlying objects being subcategorized for [- NP], allows one to state an elegant generalization regarding the derivation of adjectives from past participles.

(34) Past participles of verbs may be used as adjectives (predicates) over nouns which correspond to the initial direct object of the verb.

It is then expected that past participles of transitive verbs and of unaccusative verbs will behave in the same way, and it is understood why unergative verbs behave differently: they do not have an initial direct object.

3.1.3. In Italian, there is one more clear test that identifies unaccusative verbs. This test involves the use of the pronominal clitic NE (of them). NE appears in preverbal position but it binds a quantifier like *molti* (many), *due* (two), etc., in postverbal, object position.

(35)   Maria ne invitera due
         Mary of them will invite two
         'Mary will invite two of them'

Trying to establish the distribution of NE, we find that NE can only bind a *postverbal NP*, moreover it can only bind a postverbal NP which is a direct object. This is why (36a) is well formed, while (37a), where NE binds an indirect object, or (37b-c), where NE binds a preverbal subject are all ill-formed (Examples are due to Burzio (1986)).

(36)   a.Giovanni ne invitera molti
         Giovanni of them will invite many
         'Giovanni will invite many of them'

(37)   a.*Giovanni ne parlera a due
         Giovanni of them will talk to two
         'Giovanni will talk to two of them'
         b.*Molti ne arriveranno
         'Many of them will arrive'
         c.*.Molti ne telefoneranno
         'Many of them will telephone'

Italian is a language that allows inverted (post-verbal) subjects. Given that, one would expect NE to be possible with *postverbal passive subjects*, an expectation which is borne out.

(38)   a.Molti esperti saranno invitati
         'Many experts will be invited'
         b.*Molti ne saranno invitati
         'Many of them will be invited'
         c.Saranno invitati molti esperti
         Will be invited many experts
         'Many of them will be invited'
         d.Ne saranno invitati molti
         'Many of them will be invited'

Sentence (38b) is ruled out because the subject is preverbal; sentence (38d) is ruled in because both conditions on the use of NE are fulfilled, the passive subject has retained postverbal position. The passive subject is an underlying direct object. Next it is found that NE can also bind the inverted subject of some (but not all) intransitive verbs.

(39)   a.Ne arrivano molti
        Of them arrive many
        'Many of them arrive.'
        b.*Ne telefonano molti
        Of them telephone many
        'Many of them telephone.'

Again, the subjects of the two intransitive verbs *arrivare, telefonare* behave differently. If we want to maintain the generalization that NE refers to a post-verbal NP, which is an (initial) direct object, we must hypothesize that the (postverbal) subject of *arrivare* is an initial direct object, i.e., *arrivare* is generated in the configuration (21b), typical of what we called *unaccusative or ergative verbs*. The occurrence of NE with an NP proves that NP to be an (underlying) object; at the same time, the occurrence of NE with an intransitive verb shows that the respective intransitive verb is an unaccusative verb. Intransitive verbs like *arrivare* do not have any lexically related or identical transitive counterpart: they cannot be used transitively. On the other hand, in languages like Italian and English, there is a large number of verbs that have both a transitive use in a (surface) AVB structure, and an intransitive use in a surface BV structure.

(40)   I   a. L'artiglieria affondo due navi nemiche
            b. Due navi nemiche affondarano

(41)   E   a. The artillery sank two enemy ships
            b. Two enemy ships sank

The verb has the same meaning in both its transitive and its intransitive use; moreover, the semantic relation between constituent B (*due navi nemiche / two enemy ships*) and the verb is the same, even though B is an object in examples (40a), but a subject in (4ob). The intransitive verb in (40b) behaves like an unaccusative, it selects *essere* in the perfect, unlike its transitive counterpart, and it allows *ne* cliticization.

(42)   a. Due navi nemiche sono affondati.
             Two ship enemy are sunk
             'Two enemy ships have sunk'
             b. L'artiglieria na affondate due navi nemiche
             'The artillery has sunk two enemy ships'

c. Ne affondarono due
Of them sank two
'Two of them sank'

We will assume that the verbs which exhibit an AVB/BV alternation have both a transitive and an unaccusative use, as shown in (43a, b). This hypothesis provides a natural explanation for the intuition that the relation between constituent B and the verb is the same, despite the change in grammatical function. The unaccusative verb cannot asign the Acc case and this is why the underlying object acquires the Nom case of the subject. Transitive/unaccusative (ergative) pairs are a typical feature of English.

(43)　　a.

```
                    S
      NP _____/ \___ VP
       |        V  _____/    \___ NP
   L'artiglieria  affondo        due navi nemiche
   The artillery  sank           two enemy ships
```

　　b.

```
                    S
      NP _____/ \___ VP
      [e]       V  _____/    \___ NP
                affondarano     due navi nemiche
                sank            two enemy ships
```
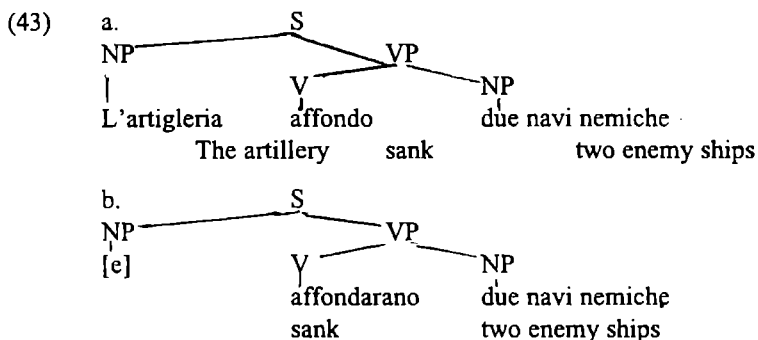
3.1.4. While as long as properties typical of direct objects are referred to, we expect a similarity between transitives and ergatives, because both have underlying objects; if properties typical of underlying subjects are dealt with, we expect a similarity between transitive verbs and *unergatives*; this time, because both have underlying subjects; this is indeed the case. An example is offered by the so-called impersonal passives of Dutch; some intransitive verbs (the unergatives) may be passivised like the transitives (and unlike the ergatives):

(44)　　a. Er werd de hele avond door een van de kinderen gehuild (unergative)
　　　　There was the whole evening by one of the children cried
　　　　b. Er werd in dere kamer vaan geslapen (unergative)
　　　　There was in this room often slept
　　　　c.*Er werd door de kinderen in het weeshuis erg snel gegroeid
　　　　There was by the children in this orphanage very fast grown
　　　　d.*Er werd door het water snel verdampt
　　　　There was by the water fast evaporated

Notice that *cry* (44a) and *sleep* (44b) are activity verbs, rather than change or state verbs like *grow* (44c). As known, passivization is an operation on the argument structure of the verb; one obligatory effect of passive morphology is that the verb's subject is demoted, it will appear as an adjunct (the *by*-phrase). But this can happen

only if the verb has an underlying subject. Hence, only those verbs that have underlying subject arguments allow passivisation. Transitives and unergatives meet this condition, but not unaccusatives. Thus, the finer grained classification of verbs into unergative/transitive/ergative/or unaccusative - which is possible in a descriptive framework that allows for more than one (level of) syntactic representation - provides adequate solutions to a variety of empirical problems.

↳ 3.2. The subcategorization of English Prepositions and Adjectives. So far, we have only been concerned with verb subcategorization; we would like to extend this discussion to other parts of speech in English. This will be a useful descriptive exercise and it will allow us to later draw more general cross-categorial conclusions regarding phrase structure.

3.2.1. Subcategorizing English prepositions. Romanian learners of English have long been puzzled by the existence in English of a part of speech that is inexistent in Romanian: the category of *particles*. More recent accounts of particles, starting with Jackendoff's (1973), seminal work on which we mainly draw in what follows, have convincingly argued that particles should be analyzed as a subcategory of prepositions, rather than as a distinct part of speech. Let us review the evidence that particles and prepositions belong to the same lexical category, which might as well include certain time and place adverbs, like *here, there, now*, etc.

a) Particles, prepositions and such adverbs subcategorize the same verbs.

(45)   Put the books down/ on the desk/ there
        She was lying down/ on the bed/ there

b) Prepositions, particles (and certain adverbs) have common specifiers, such as the adverb *right*.

(46)   He kept drinking right until midnight (right + PP)
        The boy came right from the store

(47)   I remember I put it right down (right + particle)
        Come in here, right away !

(48)   You stay right here (right + certain place/time adverb)
        Come here, right now !

Moreover, *right* does not modify manner adverbs and adjectives, so this specifier is characteristic of locative (and (some) temporal) PPs.

(49)   *He drove right carefully/slowly/well.
        *She is right pretty.

c) Prepositions, particles (and certain adverbs) may all occur in specific syntactic constructions: sentences with inversion (50), and also characteristic exclamative elliptic inverted structures (51).

(50)   a.Into the house he ran.
         b.In he ran.
         c.There you go!
         Out of the room he walked
         Out he walked.

(51)   a.Off with her head!
         Down with injustice!
         Overboard with the traitors!
         b.Into the dunjeon with the traitors!
         To hell with this assignment!

A non-argument, but, nevertheless, a broad hint that particles and prepositions might belong to the same part of speech is the fact that many prepositions and particles are homonymous (e.g., *across, about, around, by, down, in, out, up, through*). Let us tentatively assume that particles are a subclass of prepositions. The suggestion is to analyze particles as intransitive prepositions. Therefore, we will assume that the lexical category 'preposition' is subcategorized for transitivity, into the following subcategories:

a) always intransitive prepositions; this is the class of formatives that can only function as particles; these cannot take an object NP, e.g., *away, forth, aside*. The subcategorization rule and the corresponding feature are given in (52); subcategorization regards the structure of the minimal phrase containing the P, i.e., the category PP.

(52)   P [= Prt] → CS / --#   aside: [+ --#]
         e.g., to jump aside, to come forth, to go away, to lay smth aside, to fire the
         questions away, to put a proposal forth

b) always transitive prepositions; these are the formatives that must be followed by an NP, being used only as prepositions, as indicated in (53), e.g., *at, of, with, for, into.*

(53)   P → CS / - NP   at: [+ -- NP]
         e.g., to look at, to wait for, to do with, to take care of,etc.

c) prepositions that have both transitive and intransitive uses, this is the class of formatives which are both prepositions and particles, e.g., across, about, by, down, in, out, *through*,a.s.o.

(54)   P→CS / - (NP)   down: [+ -- (NP)]
         e.g., to walk across (a room), to stand by (one's friend), to hang around
         (a place), come down (one's high horse), etc.

In addition to being sensitive to transitivity, prepositions are like verbs and unlike nouns and adjectives, in their ability to directly relate to an NP; in English, nouns and adjectives relate to NPs only through prepositions: *through him/like him* vs. *fond of him/interest in him.*

d) Less frequently mentioned is the fact that prepositions may govern PPs, therefore, some prepositions are subcategorized as in (55), e.g., *out, from, until, round, because.*

(55)   P → CS / -- PP   because: [+ -- PP]
e.g., because of him, to wait until after the war, to be from near St. Louis.

We ought to also acknowledge the existence of the following rule Prep → CS / - NP PP. This would account for a large number of productive idiomatic PPs: *from* [day]$_{NP}$[to day]$_{PP}$, *from* [head]$_{NP}$[to foot]$_{PP}$, etc. The lexical entries of prepositions will, therefore, contain subcategorial information.

A problem arises in the case of complex (transitive) verbs. Since particles are supposed to represent intransitive prepositions, and, consequently, the syntactic category PP, a complex verb (i.e., a verb with particle) appears as a discontinous constituent, V - [Prt]$_{PP}$, leaving a place for the Direct Object. The advantage of this view is that this structure is the only one which accomodates both pronominal and nominal DOs, *look* [the word]up, *look* [it]up, but *look up it, look up the word.* When the object is nominal, not pronominal, the particle may be assumed to move next to the verb: *look the word up* => *look up the word.* This movement illustrates a common phenomenon: one lexical head, the preposition, moves next to another lexical head which governs it, the verb, and the two form one syntactic constituent (we will subscript the particle and the verb, to show that they form one unit).

(56)   Particle Movement (or Preposition Reanalysis)
         V - NP - [P]$_{PP}$ => V$_i$ + P$_i$ - NP

The fact that there are constructions where the particle and the verb form one unit explains the fact that the meaning of the verb and the particle may merge to a greater or lesser extent. Preposition reanalysis also takes place in the case of intransitive prepositional verbs: *look for, look after*, etc.), in case the object moves (since objects are not normally allowed to move out of Pps).

(57)   a. They [looked for][the child]   The child was looked for t
         b. They fell [into silence]   *Silence was fallen into.

Preposition reanalysis is a marked option of English, unavailable in languages like Romanian, French, etc.. This analysis is, however, not entirely satisfactory; for a different view on verbs and particles, see Johnson (1991)
        3.2.2. Subcategorizing English adjectives. A first strict subcategorial feature distinguishes between adjectives that may not occur prenominally, and occur only after link verbs (predicatively) or in postnominal position in nominal phrases (i.e., *man interested in art*).
        Most adjectives occur both prenominally and predicatively (e.g., *uncertain weather; the weather is uncertain*). Attributive adjectives accept the subcategorial

context [-N]. Most adjectives appear in this position (e.g., *beautiful dog/ big flea*, etc.). Some adjectives can only be attributive: among them there are restrictive or intensifying adjectives (*sheer, utter, utmost, only, mere, pure, alleged, chief, consummate*), temporal and modal adjectives (*future, former, late, occasional, present, current, sure, born*), adjectives related to manner adverbs, which mostly occur with deverbal nouns (*heavy smoker, heavy eater, early riser, new comer*), a few noun-based adjectivals (*chemical engineer, rural policeman*, etc.).

(58)   an utter confusion   *the confusion is utter
       the only trouble   *the trouble is only
       the alleged linguist   *the linguist is alleged
       the former king   *the king is former
       a born loser   *the loser is born

Predicative adjectives accept (at least) the subcategorial context [Vcop -]ₐᵥ, (e.g. *He is sad / He looks interested / He went mad*). Again, there is a restricted class of formatives which occur only predicatively (and (possibly) postnominally) - *ablaze, afire, awash, astir, asleep, touched, rife* (e.g. *The deck was awash/ *an awash deck*).

What is more relevant from the point of view of a cross categorial comparison is the subcategorization of adjectives function of their object-taking possibilities. As already mentioned adjectives do not govern NPs, but only PPs. There are 'intransitive' adjectives, i.e., those which take no objects and subcategorize for the null context, e.g., *red, small, tall*.

(59)   A→CS / - #   red: [+ -- #]

There are 'transitive' adjectives, i.e., those which may or must be followed by a PP; e.g. *fond, aware, afraid, interested, content, proud, satisfied*.

(60)   A→CS / - PP   fond: [+ -- PP]
       He is fond of his wife / *He is fond
       He is satisfied (with his lot)

It is interesting that there are also "unaccusative" adjectives, the adjective occurs in two structures, and the same argument is realized either as a PP, with the default preposition *of*, or as a subject, e.g., *certain, sure* (cf. Stowell (1991)).

(61)   Success was certain [- #]
       Bill was certain of success [- PP]
       A bad result is sure
       He is sure of a bad result

There are adjectives that subcategorize for complement clauses: *that*-clauses or infinitives; e.g., *confident, hopeful, indicative, thankful, ready, eager*.

(62) A → CS /--S'   ready: [+ -- S']
      I was confident that I still existed for her
      She should be thankful that her son is alive
      She is ready / eager to go
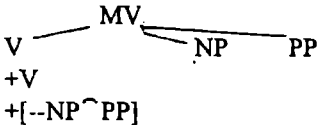
    3.3. Concluding on the subcategorization of predicative lexical categories, we may say that satisfaction of the subcategorization frame of Vs, Ps, As is a condition on the syntactic and semantic well-formedness of sentences containing those Vs, Ps, As Subcategorial information coded as a subcategorization frame or feature or otherwise is an obligatory component of each lexical entry. The subcategorial feature (like the categorial one) expresses the formal meaning of an item, that is, a principle of construction for any sentence where that item occurs as a constituent. Knowledge of an item's subcategorial properties is obligatory for anyone that qualifies as 'knowing' that item. We believe that the concept of subcategorization is an important and ultimately irreducible concept of recent syntactic theory (see below). In fact, validation of the concept of subcategorization is found in good lexicographic and teaching practice. Good dictionaries and good teachers always present words in the mimimal context needed for their proper use, e.g., one indicates *charge smb with NP, exempt smb from NP*, rather than *charge, exempt*, etc.

Chapter 5

X-BAR THEORY

1. An undesirable redundancy in the 'Aspects' model.

In the presentation of subcategorization in the preceding chapter, the reader has probably become aware that there was a redundancy between PSRs and subcategorization rules, in the sense that subcategorization rules and features duplicated information already contained in the PSRs. For instance, in the derivation in (1), the information that the verb in PM (1a) takes a DO and a PO is given twice: once in the PSR (1b), which rewrites the MV symbol, and a second time in the subcategorization rule that expands the complex symbol V and spells out its subcategorial property.

(1)   a.

             MV
      V   NP   PP
      +V
      +[--NP⌒PP]

    b.   MV → V⌒NP⌒PP

    c.   V → CS / [--- NP⌒PP]

This redundancy had little to recommend itself, so it was desirable that either PSRs or subcategorization rules should be given up. At the same time, it was felt that as components of lexical entries, subcategorization features characterised a tangible facet of a speaker's lexical competence, so that they stood a better chance of being psychologically real than PSRs.

While we reviewed the subcategorization of Vs, Ps in English, it was apparent that there were important similarities in the internal structure of phrases of different categories (MVs, PPs, APs). This state of affairs suggested the possibility of generalizing over the data and of formulating *cross-categorial* or rather *category neutral* syntactic rules. These should indicate the general principles of *phrase structure* organization and should define parameters of variation regarding the organization of phrasal categories within a language or across languages.

The UG subtheory which is concerned with the principles of phrase structure organization is called *X'* - *theory* (read x-bar theory). It should be added that some version of phrase structure theory is included not only in the GB model, but also in most currently still employed syntactic frameworks, such as Generalized Phrase Structure Grammar Lexical Functional Grammar. Specific differences in PS theory result from the overall interaction of the postulated components of these grammars.

2. X'-Theory.

The intuitive idea of X'-theory is that phrases are built round lexical heads, they are projections of structure round lexical categories. Hence, the central principle of *endocentricity*, which says that every phrase XP has a head X^O, which is a lexical category; or, if one looks at the same configuration from bottom to top, instead of from top to bottom, every lexical category X^O projects (a series of subcategories X^O, X'...) to a maximal projection X^{max} or XP. Secondly, it seems plausible to claim that constituents which are closely linked to the head X^O - because they are selected by the X^O head and are mandatory elements of (minimal) phrases of type X - should be in the first projection of the head X'; in contrast, constituents which are less dependent on the head should be in higher head projections X^2...XP. Given the way subcategorization was characterized, it may be accepted that subcategorized constituents of some head X^O are always in the first projection of X^O, X'. Two statements of X'-theory have been established so far:

1) The principle of endocentricity
   a. Every phrase XP has an X^O lexical head.
   b. Every lexical head X^O projects to a maximal projection XP.

2) The first projection of some X^O, X' contains all and only subcategorized constituents, called *complements* of that head, i.e.:

$$X' \rightarrow X^O \frown \text{Complements}$$

Here are examples:

(2) $V' \rightarrow V^O \frown NP$ We are nearing the medow.
       $P' \rightarrow P^O \frown NP$ Near the meadow they built a house.
       $A' \rightarrow A^O \frown PP$ The house was nearer to the meadow now.
       $N' \rightarrow N^O \frown PP$ Nearness to the meadow was the great virtue of our house.

2.1. Outside the first projection, there are the "specifiers" of the phrase, so that Chomsky (1970,1981) proposes the following general scheme to represent the structure of any XP:

(3) $X'' \rightarrow \text{Spec} \frown X'$
       $X' \rightarrow X^O \frown \text{Complements}$

The term specifier is in need of clarification and there has been a great deal of ambiguity in its use in the literature. Some authors (e.g. Jackendoff (1977), Stuurman (1985)) give it a more restricted syntactico-semantic interpretation, namely, the term "specifiers" refers to closed-class elements, such as determiners (4) or degree words (illustrated in(50), which in some intuitive sense, specify the reference of the head (phrase). Here are examples illustrating the schema in (3), under this interpretation of the term specifier.

(4)   a.   two pictures of my brother

```
              N''
        Spec       N'
        DP    N⁰       PP
        D'    |      /‾‾‾‾‾\
        D⁰    |     /        \
       two  pictures   of my brother
```

b.   that passion for music

```
              N''
        Spec       N'
        DP    N⁰       PP
        D⁰    |      /‾‾‾‾\
       that passion    for music
```

(5)   a.   rather pleased about it

```
              A''
        Spec       A'
        AvP   A⁰       PP
        Av'   |      /‾‾‾‾\
        Av⁰   |     /        \
      rather pleased   about it
```

b. so very tall

```
                    A''
              Spec       A'
         Av''               |
      Spec    Av'           |
      AvP    Av⁰            A⁰
       so    very          tall
```
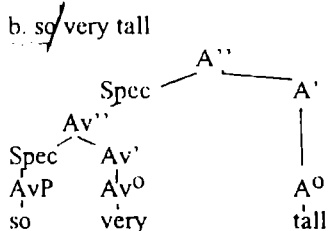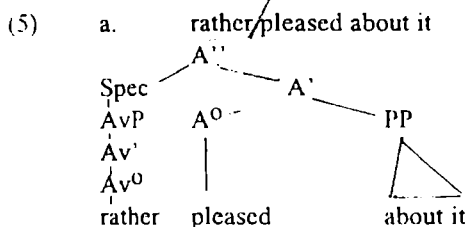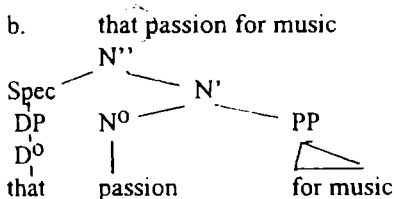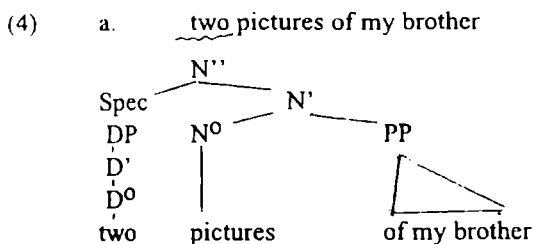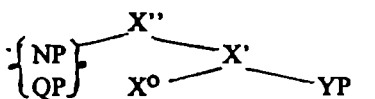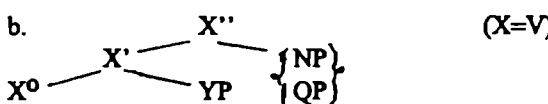
It should be emphasized that the general principles of X'-theory concern *hierarchical* relations (dominance relations), not linear order (precedence relations). The left-right position of the complements and of the specifiers is one of the parametrised options of UG. Moreover, since any X^0 projects to a maximal XP, and each phrase has only one head, it follows that all the non-heads of a phrase, specifiers or complements, are YPs, i.e. maximal projections. Taking all this into account, the schema (3) may be rewritten as (6). The star indicates that more than one YP may occur.

(6)   a. $X'' \rightarrow X'$, YP*

   b. $X' \rightarrow X^0$, YP*

Schema (6b) reveals a different, purely syntactic interpretation of the term 'specifier' A specifier is any phrase YP which is a sister to an X' constituent; any

phrase which is not a complement. Here is an example in which NPs act as specifiers of P', A', N' projections, to the left of the head, or as specifiers of V' to the right of V'. Examples (7a-c) have structure (8a); (7d) is represented in (8b).

(7) a. She moved [[two meters]$_{NP}$ [to the left]$_{P'}$]$_{P''}$
     b. The river is [[many miles]$_{NP}$ [[long]$_{A_0}$]$_{A'}$]$_{A''}$
     c. The alloy is [[two parts]$_{NP}$ [[steel]$_{N_0}$]$_{N'}$]$_{N''}$ P'
     d. She had [[seen him]$_{V'}$ [several times]$_{NP}$]$_{V''}$

(8) a.   X''   (X =P, A, N)

     $\left\{\begin{matrix} NP \\ QP \end{matrix}\right\}$ X'
                     X^0 YP

     b.   X''   (X=V)

         X' $\left\{\begin{matrix} NP \\ QP \end{matrix}\right\}$
     X^0 YP

QPs may also act as specifiers cross categorially; and there is the same asymmtery that we noticed before: QPs occur before Ps, Ns, As, but after Vs, as shown in (8a,b). Examples involving QPs are given in (7e-h).

(7) e. He should move [$_{QP}$[much more] $_{P}$[to your right]]$_{P''}$
     f. These days,he is [$_{QP}$[much less] $_{AP}$[interested in art]]$_{A''}$
     g. He showed [$_{QP}$[much more] $_{N'}$[interest in the painting]]$_{N''}$
     h. He couldn't [[love her]$_{V'}$ [more than he does]$_{QP}$]$_{V''}$

" Specifier" becomes a cover term referring to a great variety of constituents. While this broad, purely syntactic view of the term specifier (also advocated by Speas (1991), Webelhuth (1992)) is likely to be correct, in agreement with most literature and with schema (3) we shall, *at least for English, use the term 'specifier' for pre-head* constituents and employ the terms 'modifier' and 'adjunct' for posthead constituents which are not complements. Thus, adjectival phrases (*man taller than Alice*), relative clauses (*man who is taller than Alice*), etc. are currently known as 'nominal modifiers', while adverbial phrases (*run [very fast]*, *arrive [yesterday]*, certain PPs (*see her [on that day]$_{P}$...*), adverbial clauses (*see her [when he arrived]*) go under the name of 'adverbials' or 'adjuncts' or 'verb modifiers'.

What seems to matter is to keep distinct heads and complements (arguments) on the one hand, from non-arguments. The argument/adjunct distinction will play a part in other modules of the grammar, particularly in stating restrictions on movement rules. One point (on which agreement has not been reached (see Speas, (1991)) is that, for certain categories, specifiers (in the wide acceptation of the term) may be *iterated*, as in examples (9a,b), represented in (9c,d).

(9) a. a fairly recent quite challenging description of this country

    b. He had waited for her in the rain for three hours.

    c.
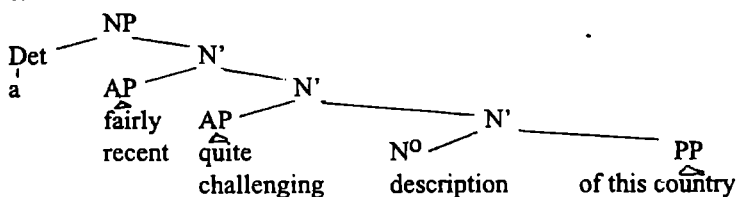
    d.
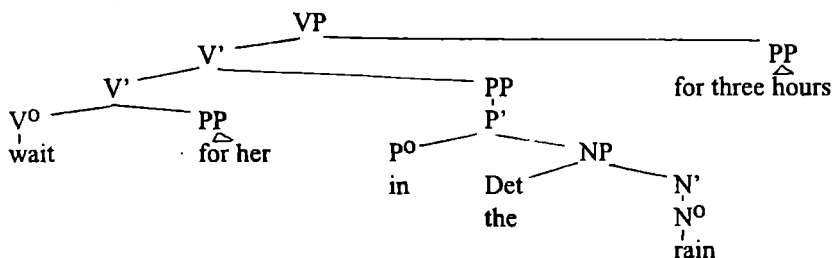
Thus, nothing in schema (6) stipulates how many intermediate bar levels are allowed to exist. In fact, an even stronger statement can be made. Only the head X^0 node and the maximal projection XP are theoretically significant categories of the grammar, in the sense that its rules and principles make reference only to heads and maximal projections, and these two categories can be precisely defined (cf. Speas 1991: 44):

(10)   a. <u>Minimal Projection</u>: $X = X^0$ iff X immediately dominates a word.

        b. <u>Maximal Projection</u>: $X = X^{max}$ iff for all Gs which dominate X, G $\neq$ X ; for example, in (9d), the circled node is a maximal N projection, since the nodes that dominate it, P', PP, V are all different from N.

The intermediate X'-level behaves like a sort of 'elsewhere' case, to which the principles of the grammar do not specifically refer. This is not to say that intermediate projections are not affected in the course of a derivation; on the contrary, they may be coordinated (11b), anaphorically referred to (12b), etc. But they are affected by those processes which are indiscriminate as to the level of projection that they affect, and may operate on any constituent (head, intermediate projection, maximal projection). Here are examples involving coordination and anaphoric substitution at all N levels:

(11)   a. [these [old [[men]$_{N_0}$ and [women]]$_{N_0}$]$_{N'}$]$_{N''}$

        b. [these [[stupid men]$_{N'}$ and [smart women]$_{N'}$]$_{N'}$]$_{N''}$

        c. [[these stupid men]$_{N''}$ and [those smart women]$_{N''}$]$_{N''}$

(12)   a. the [picture]$_{N_0}$ of Julia and the [one]$_{N_0}$ of Mary

        b. this blue [Cadillac with automatic gear transmission]$_{N'}$ and that red [one]$_{N'}$.

c. Give me [a blue pencil]$_{N''}$ if you have [one]$_{N''}$

1.2. Let us look back and ascertain the results of our discussion so far.

PSRs were supposed to indicate the categorial constituency of phrases and also the order of these constituents. X'-theory has completely given up individual rules which were surely language- and even category- dependent, in favour of a few general priciples:

1. Endocentricity. Every X^0 projects to X^{max}.
2. The definition of minimal and maximal projection.

The statements of X'-theory, summarized as (13a,b, where (13a) is the unordered version of (13b)) below, or as the more traditional, English-oriented (13c), merely regard dominance (hierarchical) relations; it is these general principles that are part of innate universal grammar, "part of the predisposition for language", to quote Humboldt's phrase. Word order patterns represent parametrized options and they are learnable on the basis of direct positive evidence, to which the learner is exposed.

(13)   a. $X'' \rightarrow X'$, YP^* b. $X'' \rightarrow (Spec)^\frown X'$
            $X' \rightarrow X^0$, YP^* $X' \rightarrow X^{0\frown}$ (Complements)

       c. $X'' \rightarrow (Spec)^\frown X'^\frown$ (Adjunct)
            $X' \rightarrow X^{0\frown}$ (Complements)

The replacement of the base component - which was a complex system of context free, and context sensitive, rules, which were universal only in that their format was constrained by the formalism of UG - by a scheme like (13), in conjunction with parametrized word order statements, clearly illustrates what is meant by saying that the conception of *grammars as rule-systems* is given up in favour of a conception of *grammars as systems of principles and parameters*.

3.The functional structure of language.

Since the principles of X'- theory do not indicate the particular constituents of any phrase, this information must be derived from other components of the grammar. Actually, it is generally the case that *each element in a sentence representation should be licensed and thus justified by some subtheory of the grammar*. This is the so-called principle of *Full-Interpretation* (Chomsky, 1986b).

A case in point is the way in which the structure of the first projection, X', of some head X° is determeined. The constituency of the first projection follows from the lexical properties of the head, specified in the subcategorization feature(s), available in the *lexicon*. The complements are licensed by the *lexical properties of the head*, which is an *unsaturated* element requiring a certain number of arguments for saturation, and moreover requiring a particular morpho-syntactic coding of these arguments (i.e. the cases or prepositions of the arguments depend on the head's subcategorial properties; this is illustrated by contrasts like *blame the accident on John, blame John for the accident*, etc.

In fact, the same principle, which states that lexical properties of a word determine the structure of any phrase where it occurs, may be shown to determine the structure of intermediate level projections and maximal projections as well.

The general idea one could be building on, as suggested by Webelhuth (1992), is that languages have *functional* structure. The idea has been forcefully expressed and formalized by Frege (1884), who elaborated a classification of linguistic expressions in terms of their semantic and syntactic (or combinatorial) properties. In "Function and Concept", Frege writes "Statements can be imagined to be split up into two parts: one complete in itself, and the other one in need of supplementation or 'unsaturated'. Thus, we split up a sentence like *Caesar conquered Gaul* into *Caesar* and *conquered Gaul*. The second part is 'unsaturated' - it contains an empty place; only when this place is filled up with a proper name or with an expression that replaces a proper name does a complete sense appear. Here too, I give the name "function" to what is meant by this 'unsaturated' part. In this case the argument is *Caesar* (Frege, 1884, 146 f.)." And the same idea about saturation occurs again in the following passage from "Concept and Object": "not all the parts of a thought can be complete, at least one must be 'unsaturated', or predicative, otherwise they would not hold together. For example, the sense of the phrase *the number 2* does not hold together with that of the expression "the concept *prime number*" without a link. We apply such a link in the sentence *The number 2 falls under the concept prime number*; the link is contained in the words "falls under", which need to be completed in two ways - by a subject and an accusative; and only because their sense is thus 'unsaturated' are they capable of serving as a link. Only when they have been supplemented in this two-fold respect do we get a complete sense, a thought." (Frege 1984, 143).

We will adopt Frege's idea that we conceptualize what we talk about in terms of objects and properties of objects, or relations between them. Furthermore, we will assume (as also done in categorial grammars) that UG grammaticalizes this division into objects and properties/relations, by making available substantive universals that define each linguistic expression either as syntactically saturated or as unsaturated. On Frege's account, complete or saturated expressions are of two types: proper names (i.e. (very) loosely speaking NPs) and sentences. Both can pick up referents in the world: objects or individuals in the case of proper names (e.g. the proper name 'Napoleon' refers to the bearer of the name Napoleon), and (true or false) states of affairs, in the case of sentences. One interesting semantic consideration as to why proper names, rather than predicates, should be viewed as complete expressions comes down from Aristotle (cf. Dummett (1973)); Aristotle compares *substances* (i.e. proper names) and *qualities* (predicates), and notices that a quality has a contrary, that is to say that for any predicate, there is another predicate, which is true of just those objects of which the original quality is false. To say that an object does not have a contrary is to say that, in general, we cannot assume that, given any object, there is another object of which just those predicates are true which were false of the original object, and conversely. Compare *smoker* (a noun, a predicative expression) which has the contrary *non-smoker*

and *Socrates*, an NP, a saturated expression, for which there is no contrary object *non-Socrates*. This indicates that *Socrates* is not a predicate.

As shown by Webelhuth (1992:10), "syntactically unsaturated expressions would be all those that are marked for combining with a complement, but also all specifiers and modifiers, i.e. those elements lexically marked for syntactically combining with a specifiable or modifiable expression."

Complementation, specification and modification appear to be 'forms' or 'modes of saturation', *each associated with a particular phrase structure realization*, so that the incomplete expression and its saturator(s) should form a constituent.

3.1. Starting once more from complementation, which is better understood, let us review the kind of lexical information about the verb which was used in projecting the first verbal projection V':

a) categorial information that some item is a V, i.e. the categorial feature [+V];

b) information about the syntactic category of its complement (whether its complement is a PP, an S, an NP, etc.);

c) the direction of the complementation relation (i.e. whether complements precede or follow the head.) Information of types b) and c) is the subcategorial information found in the lexicon.

Taking, for instance, the verb *hit,* characterized as + V, + [--- NP], we know that it is a verb, that it selects an NP as its complement, and that it precedes its complement. On the basis of such lexical information, it is conceivable to state · a (possibly) universal projection clause for complementation (cf. Webelhuth, 1992: 44).

(14)   Projection of the Complement Relation

If   a. α is a member of category X^0.

b. β is a member of category YP.

c. α takes members YP as complements,

then, if α takes its complements on the right,

[$\alpha\beta$] is a member of category X', and,

if α takes its complemets on the left

[$\beta\alpha$] is a member of category X'.

(15)   a.
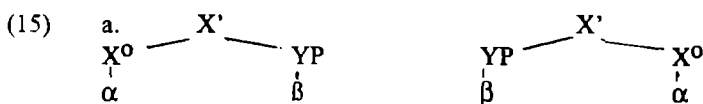
4. More on heads, the head - initial / head - final parameter.

4.1. The importance of the head in any phrase is expressed in the principle of endocentricity, which informally says that phrases are built around heads. Moreover, the way in which phrases combine with each other also follows form the lexical

properties of the head. The head is said to *transmit its features* to the higher projections; the process by which categorial and other features are projected up from the lexical head is called (down-up) *percolation*. As emphasized by Lieber, 1992: 77 "only morpho-syntactic features percolate". Consider an example:

(16)   a.Bijuteria aparține [$_{NP}$acestei [$_{N'}$[$_{AP}$foarte tinere] [$_{No}$doamne]]]
           b.Bijuteria aparține [$_{NP}$[$_{N'}$[$_{No}$ Mariei]]]

The head *doamnă* transmits its categorial feature [+ N] upwards, to the NP node. Other morpho-syntactic features of the noun, such as its gender and number specifications, also percolate to the higher nodes, so that the NP is marked [+ feminine, + singular]. These features reach the AP, and then the adjectival head itself, through *up-down percolation*. The form *tinere* of the adjective, which is also [+ feminine, + singular], shows agreement with the noun. At the same time, the comparison of (16a) with (16b) shows that the distribution of the NP [*acestei foarte tinere doamne*] in (16a) is the same as the distribution of the head N^0 in (16b). The following generalization emerges:

(17)   Wherever a head can appear, its maximal projection can appear.

Acceptance of principle (17) allows a more fine-grained view of subcategorization (cf. Baltin (1989)). We have said that heads subcategorize for complements, which are maximal projections, and sisters to the head, in the configuration (15a-b). This description implies that heads categorially select for maximal projections, i.e. we specify what kinds of (maximal) phrases a head selects. But, if the properties of any phrase YP are given by the properties of the head Y^0, we might just as well say that, in fact, a head X^0 categorially selects for another head Y^0, since given generalization (17), it follows that X^0 will then accept maximal projections of Y^0 (i.e. YPs) as its complements. In other words, we might propose a principle like (18):

(18)   Subcategorization is (always) for a head.

This statement implies that a head selects for the head of its complement, i.e. *subcategorization is viewed as head-head selection*. It is worth mentioning that there is persuasive empirical evidence favouring the view of subcategorization as head-head selection. We will discuss only two examples. The first involves verbs and complement clauses. Remember that complement clauses are S' projections, i.e. S' constituents, whose structure is given by rule (19). In this PSR, the complementizer is viewed as the head of the clause.

(19)   S' →COMP⌢S

The justification for this claim is that choice of the complementizer determines whether a complement is finite or non-finite, and often, also what particular finite or

non-finite mood is selected. Mood selection may influence other aspects of the syntax of the complement clause (e.g. the use or the position of the subject). Thus, the complementizer *that* in English is followed by a finite (indicative or subjunctive) complement (20a). The complementizer *for* selects a non-finite infinitival complement, whose subject is in the Accusative. In Romanian, the complementizer *că* selects a finite indicative clause (20c), while *ca* selects a subjunctive complement (20d).

(20)   a. I hope [$_{S'}$that [$_S$he will succeed]]
          b. I hope [$_{S'}$for [him to succeed]]
          c. A hotărât [$_{S'}$că [$_S$nu mai pleacă mâine]
          d. A hotărât [$_{S'}$ca [$_S$nimeni să nu plece mâine]

Let us remark, in passing, that since in (19) the complementizer ia regarded as the head of the sentence projection, the notation S', which has been, and still is, current, is not appropriate, because it does not indicate that the complementizer is the head of the construction (of course, S itself *could not* be the head of S', since it is not a lexical, $X^{0'}$ constituent). In later chapters, a more recent and perspicuous notation will be introduced, more in the spirit of endocentricity, which shows that Ss are complementizer projections, but this detail is inessential at this point. Coming back to verb subcategorization, it is easy to notice that in English and other languages, it is not enough to say that a verb is subcategorized for a complement, i.e. for a phrase of type S' [- S']; it is also necessary to specify what types of complement is selected, and this can be done by indicating what complementizer the verb is subcategorized for. Different verbs select different complementizers (cf. Bresnan (1970)), as is apparent in (21).

Declare selects for a *that* complementizer, and *wait* selects for a *for* complementizer. Consequently, we might rewrite their subcategorial feature [- S] as in (22), which is a descriptively more informative and more fine-grained statement.

(21)   a.   John declared [that Sally was insane].
                *John declared [for Sally to be insane].
          b.   *I was waiting [that Sally left].
                I was waiting [for Sally to leave].

(22)   declare   +V,+[- [$_{S'}$that]]
          wait   +V +[- [$_{S'}$for]]

A second example confirming that head-head relation is a better view of subcategorization refers to subcategorized prepositions. It is not enough to know that a verb needs a PP complement; it is vital to know which P^0 or P^0s may be used with that verb. The subcategorial frame of *inform* would directly state that its prepositional complement is headed by *of*, and likewise for *charge*, or *depend*:

(23)   inform +V, +[- [N] [$_P$of]
         charge +V, +[- [N] [$_P$with]
         depend +V, +[- [$_P$on]]

Further proof of the utility of head-head selection comes from the domain of VP idioms. We could view idiomatization as a species of subcategorization (cf. Baltin (1989)) and then we could note that the constituants of the idiom always involve the head of the phrase (V^O) and the head of one of its complements, e.g. *make headway, keep track of, keep tabs on*.

(24)   keep   +V, +[- [$_N$track] [$_P$of]]
         keep   +V, +[- [$_N$tabs] [$_P$on]]
         make   +V +[- [$_N$headway]]

We may retain principle (18) as a valid statement in the theory of subcategorization.

4.2. One problem of head syntax, which goes beyond the head complement relation, is the position of the head with respect to its complements, modifiers and specifiers, generally, the position of the head within a phrase. Linguistic variation along this line is expressed by the so-called *headedness parameter* (cf. Travis (1992)), which distinguishes between head-initial languages, like English, and head final languages, like Japanese; therefore, this parameter is also called the head-initial / head - final parameter. This important word order parameter may be set differently, not only across languages, but also from one syntactic category to another in the same language (see German and Dutch, below); however, the statistic tendency is that within the same language there should be consistency, in the way this parameter is set. In a deservedly famous study, Greenberg (1963), reports that V-O languages tended to be prepositional, i.e..to exhibit the P-O order, while O-V languages tended to be post-positional; i.e., the O-V order correlates with the O-P order. There is therefore consistency in the way Ps and Vs treat their objects. Because of the centrality of the verb in the overall organization of the sentence, the VO/OV distinction has always been regarded as a significant typological factor (cf. Greenberg (1963)).

English and all of the Romance languages are consitently *head initial* in *the head-complement* relation as shown by the following English and Romanian examples, where we examine the four major complement-taking lexical categories V, P, A, N:

(25)   E   V   read a book
              P   for my father
              A   proud of his son
              N   destruction of the city
         R   V   citi o carte
              P   pentru tatăl meu
              A   mândru de fiul lui
              N   distrugerea orașului

Among the Germanic languages, German and Dutch seem to be exceptional in that they are OV languages, i.e. they are head-final regarding verb projections, while being head-initial in their P, A, /V projections. Examples are due to Webelhuth (1992).

(26)	German	V	ein Buch lesen
	Dutch		een boek lezen
	Swedish		träffade flicken
			'met the girl'
	Danish		kender en mand
			'know a man'
	Norwegian		vant lopet
			'won the race'
	English		read a book

This asymmetry within the Germanic family is not found with respect to other categories: Ps, As, Ns consistently project their objects to the right:

(27)	German	P	mit einem Hammer (with a hammer)
	Dutch		met Marie (with Mary)
	Swedish		med honom (with him)
	Danish		til sin sekretar (to his secretary)
	Norwegian		med Ola (with Ola)
	English		with a hammer

(28)	German	A	stolz auf Maria (proud of Mary)
	Dutch		tevreden met hem (satisfied with him)
	Swedish		tillgiven sin hurse (devoted to his master)
	Danish		stolt af Eva (proud of Eva)
	Norwegian		stolt av Eva (proud of Eva)
	English		proud of his children

(29)	German	N	die Zerstörung der Stadt
			(the destruction+the city (Gen))
	Dutch		de verovering van de stad
			(the conquest of the city)
	Swedish		eröveringen av staden
			(the conquest of the city)
	Danish		erobringen af byen
			(the conquest of the city)
	Norwegian		odeleggelsen av byen
			(the destruction of the city)
	English		the destruction of the city

It is important that the way the headedness parameter is set may change in the history of a language; this was precisely the case of English, which was an OV language in the initial Old English stage.

(30) OE gif hie him æs rices u on
          'if they him this kingdom granted'
      E   if they give him this kingdom

The head-initial / head- final parameter will be shown to interact in significant ways with other word-order parameters such as the direction of case assignment and of thematic role assignment.

Needless to say, what these projection clauses and word-order parameters refer to is the generation and order of constituents at the level of D-Structure.

5.The generation of higher level projections.

5.1.We will next examine the generation of higher projections X^n /XP without necessarily distinguishing between intermediate and maximal projections, because what counts is the distinction between heads and phrases. For perspicuity we will examine the relation of modification: noun modification by adjectives, and verb modification by adverbs.

(31) a. $[[_{A_0} \text{nice}]_{AP}[_{N'}[_{N_0} \text{girl}]]]$
      b. $[[_{A_0} \text{detailed}]]_{AP}[_{N'}[_{N_0} \text{presentation}] [_{PP} \text{of the facts}]]$
      c. $[_N[_{AP}[_{AvP} \text{fairly}] _A[[_{A_0} \text{detailed}]]] [_N \text{presentation of the facts}]]_{N'}$

(32) a. $[_N[_{N_0} \text{haină}]] [_{AP}[_{A_0} \text{ruptă}]]]$
      b. $[_N[_N \text{prezentare a faptelor}] [_{AP} \text{foarte amănunțită}]]$

(33) a. $[[_{V'}[_{V_0} \text{run}]] [_{AvP}[_{Av_0} \text{slowly}]]]_{V'}$
      b. $[[_{V'} \text{present the facts}] [_{AvP} \text{fairly accurately}]]_{V'}$

(34) a. $[_{V'}[_V[\text{aleargă}]] [_{AvP}(\text{prea}) \text{încet}]]$
      b. $[_{V'}[_V \text{prezintă faptele}] [_{AvP} \text{foarte amănunțit}]]$

Remember that the hypothesis which is being explored is that the structure of the phrases depends only on the lexical properties of its constituents; the relevant lexical properties are again: a) the syntactic category of the unsaturated modifier phrase YP; b) the syntactic category of the modifier X' and the relative order of the constituents in the modification structure. In (31) and (32), APs combine with noun projections and yield noun projections. To what extent is this a *lexical* property of adjectives? We have to remember that it is the head of a projection whose categorial features percolate to the maximal projection and which determines the distribution of the phrase. It is a lexical property of the adjective that it may modify a noun (31a, 32a), and this lexical property of the head percolates to the AP. Likewise it is a lexical property of adverbs that they modify verbs (33a, 34a) and this is also true of AvPs.

The following projection clause can be stated for the generation of higher (maximal) projections in modification and specification relations:

(35) If   a. α is a member of category YP (i.e. a maximal projection)
b. β is a member of category X^n,
c. α takes members of category X^n as modifiees / specifiees
then, if α takes its modifiee/specifiee on the right
$[\alpha\beta]$ is a member of category X^n / XP and
if α takes its modifiee/specifiee on the left
$[\beta\alpha]$ is a member of category X^n/XP.

The projected configurations are (36a-b).

(36) a.
$$X^n/XP$$
YP X^n
α β

b.
$$X^n/XP$$
X^n YP
β α
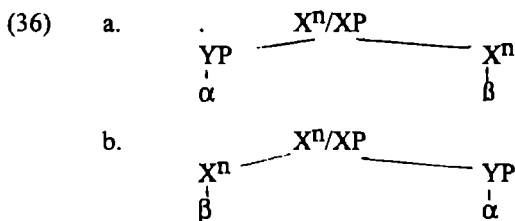
The headedness parameter is again invoked for determining whether in a given language modifiers and specifiers precede or follow the head. Comparing the examples in (31-34) it appears that Romanian is more consistent in allowing both adverbs and adjectives to appear to the right of their heads, while in English adjectives that do not have complements *must* precede the head: E *red apple* / *apple red* / R *măr roşu*. In (37), (38) we have projected (31c, 32b) and (34a,b).

(37) a.
N'
AP   N'
AvP   A' N^0 PP
fairly   detailed   presentation   of the facts

b.
N'
N'   AP
N'   NP   AvP   A'
prezentare   a faptelor   foarte A^0
amănunţită

(38)
V'
V'   V'
V^0 NP   AvP   Av'
present   the facts   fairly Av^0
prezintă   faptele   foarte   accurately
amănunţit
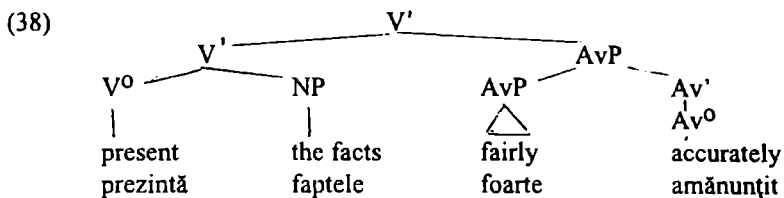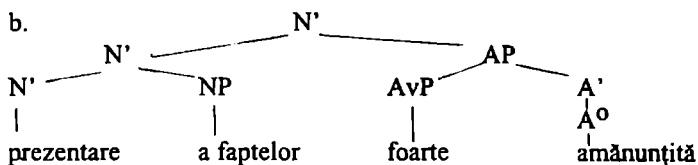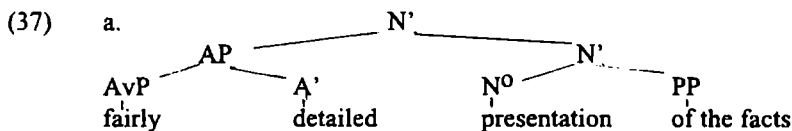
5.2. Notice in the examples that the modifier operates on X^n and produces an X^n, so that if X^n is an unsaturated expression the result of the modification is also an unsaturated expression. This is an important *semantic* property of modifiers and modification; it is probably because the semantic type of the modifier does not change that one intuitively feels that the modifier is "optional"

In contrast, certain specifiers (in the narrow, syntactico-semantic, sense) operate on unsaturated expressions and yield saturated ones; they "close off" projections and thus always produce *maximal* (as opposed to intermediate) projections (XPs). The best example is provided by nominal determiners. For instance, the addition of a determiner to the N' projection in (31a,c) produces the saturated NP maximal projections; as shown below. The saturated NP will then be able to function as the argument of some argument-taking expression.

(39)   a. [the [nice girl]$_{N'}$]$_{N''}$

b. [this [fairly detailed presentation of the facts]$_{N'}$]$_{N''}$

c.

```
                        NP
          Det                      N'
                      AP                   N'
              AvP          A'      N⁰          PP
              Av'          A⁰
              Av⁰
          this  fairly    detailed  presentation  of the
                                                   facts
```
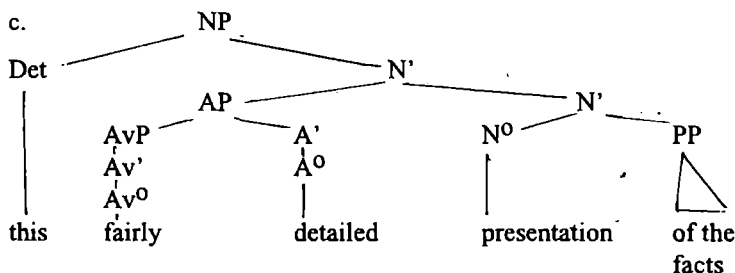
It should be obvious that although the functional structure of language determines the combinatorial power of lexical items and phrases to a considerable extent, the concepts of 'maximal projection' and 'saturated expression' *do not coincide*. The AP in all our examples is syntactically a maximal projection, but it is semantically unsaturated. As usual, syntax and semantics interact, but do not overlap.

5.3. Continuing to ivnestigate the headedness parameter for various relations, the following descriptive remark can be made: those higher specifiers that may close off maximal projections are placed to the left of the head in Germanic and Romance. Here are a few examples.

(40)   E   N''   [$_{N''}$the [$_{N'}$king of France]]
            A''   [rather [$_A$tired of dancing]
            P''   [right [$_P$on the table]
       R   N''   [$_{N''}$un [$_N$domn din Anglia]]
            A''   [$_A$cam [$_A$obosit de atâta dans]]
            P''   [$_{P''}$drept [$_P$în mijlocul străzii]]

The headedness parameter always represents the regular semantically and pragmatically unmarked word order choice in a language. The headedness parameter is

set by the language learner on the basis of positive evidence, by his being exposed to lots of examples of the same type. The examples reflect the lexical properties of the majority of the items belonging to some category. Against the generalization expressed by the word-order parameter, one defines *lexical exceptions regarding word order*. To give an example, notice the following paradigms in English and French, confirming that specifiers of degree of the adjective occure to the left of the head; i.e. English and Frech are head final with respect to specifiers:

(41)   a. John is [very   ]rich.
                  [extremely   ]
                  [quite   ]
                  [too   ]
                  [*enough   ]
         b. Jean est [trés   ] riche.
                  [extrèmement]
                  [bien   ]
                  [trop   ]
                  [assez   ]

The generalization is that almost all specifiers of A' precede the element they specifiy in English, with the exception of the morpheme *enough*. As can be seen in (41b), the distribution of French degree adverbs is fully uniform, in that all elements, including the translation of *enough,* precede their specifier. *Enough* represents a word-order exception and its exceptional behaviour must be listed in the *lexicon* and is part of what everyone should learn over and above the regularities included in the grammar. In contrast, the entry of unexceptional items need not include information regarding the headedness parameter.

5.4. As a conclusion to this first presentation of X-bar theory we would like to quote the following very apt statement by Speas (1991: 1): "One of the first lessons learned by the student of language or linguistics is that there is more to language than a simple vocabulary list. To learn a language, we must also learn its principles of sentence structure, and any linguist who is studying a language will generally be more interested in structural principles than in the vocabulary per se. It is especially interesting, then, that in recent years, linguistic research within quite diverse frameworks has been converging on the idea that sentence structure is to a large extent a reflection of the properties of lexical items" (emphasis mine AC).

6. Introducing the theory of government.

6.1. The Government and Binding model is defined as a modular system of principles and parameters; each module of the grammar - the X-bar module is an example - has its own principles which define specific dimensions of, and constraints on, linguistic variation; these dimensions of variation are the parameters.

In addition, there are a few core concepts that unify the various modules, because they play a key role in defining the concepts of those modules. *Government* is one such basic notion, a notion which is in fact inherited from traditional European grammar.

One of the major traditions in European syntax, going back to the Greek grammarian Apollonius Dyskulos (V B.C.), defined syntax as the study of *word constructions* (cf. Stati (1963)), while morphology dealt with *word structure*.

A construction was a semantic unit whose terms were bound by some characteristic *formal relation*. The basic formal relations that bound the terms of a construction were *government* and *agreement* (concord). Both referred to relations between a head and a dependent term. In one of his early works, Hjelmslev (1928) offers the following definitions of government and concord:

If the two terms of a construction are bound by agreement, the dependent term shows its relation of dependence on the head, without making it more specific, since the category for which the dependent term is marked is inherent in the head. For instance, in *these books*, the dependent term *these* shows number agreement, and the category of number is an inherent category of the head noun.

If the two terms of a construction are bound by government, the dependent term shows its dependence on the head and makes it more specific since the category for which the dependent term is marked is not inherent in the head. The prototypical example of government is government of an NP by a verb, e.g. *see him*. The NP *him* is marked for the Accusative case to show its dependence on the verb; but the category of case, for which the dependent term is marked, is not inherent in the head, i.e. it is not one of the verbal categories. Configuration (42), which is a typical government configuration, indicates at least the following facts: a) the head-complement relation implies government, i.e. subcategorized constituents are governed; b) case is assigned under government.

(42)
```
              V'
      _____
   V°              NP
  see              him
  --------→Acc
```
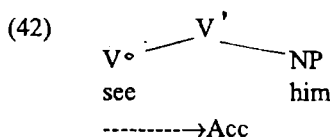
The traditional concept of 'government' has been formalized and somewhat extended to define a particular structural configuration. The intuitive idea behind defining such hierarchical configurations is that most syntactic processes (agreement, anaphoric relations, case-marking, etc.) are fairly *local*. Notions like 'government', c-command, proper-government , a.o. which are used in syntactic theory, are meant to delimit *syntactic domains* within which certain syntactic processes may or must occur.

6.2. Government is defined in terms of a more primitive notion of c-command. The term c-command (constituent command) was introduced in linguistic parlance by Reinhart (1976) in a study of anaphoric relations (i.e. relations between various types of pronouns and their antecedents). C-command expresses the intuitive idea that two nodes

α and ß are in the same constituent and that α is superior, or at least not inferior to ß. There are two variants of the definition:

(43) a. C-command (Reinhart's definition)
α c-commands ß iff,
every branching node dominating α dominates ß.

b. M-command
α m-commands ß iff,
every maximal projection dominating α dominates ß.

The second definition is more permissive than the first, as can be seen by examing (44).

(44)
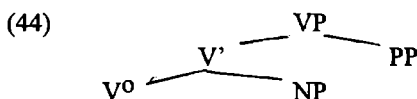
In (44), the verb c-commands the NP, since the first branching node V' over V^0 also dominates the NP, but it does not c-command the PP; on the other hand V^0 m-commands both the NP and the PP since the first maximal projection above V^0, VP also dominates the NP and the PP. In the more recent literature (e.g. Baker (1988), Cowper (1992) a.o.) c-command is understood as m-command (even though the term c-command is used). When it is relevant to differentiate between them either the two terms 'c-command' vs 'm-command' are used, or c-command in Reinhart's sense is referred to as 'strict c-command'. C / M-command is an asymmetrical relation in which one term is higher and dominated by the relevant *first* branching, or maximal projection node, while the second term can be far down the tree; (see (45), where XP c-commands YP). An example is the subject NP which c-commands any NP in the VP, since the sentence node S which is the first maximal projection node above the subject NP, also dominates NP_2, PP_3 and NP_4. NP_1 thus defines a certain *c-command domain*, a particular syntactic space

(45) a.

b.
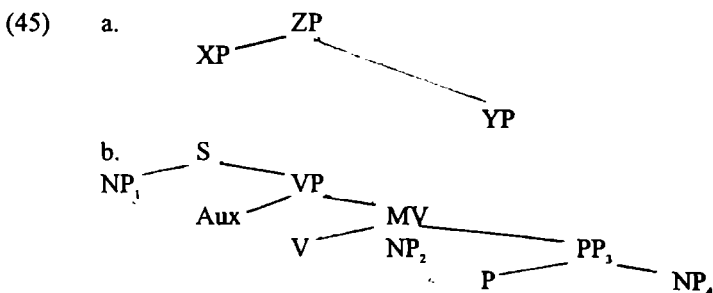
In order to prove the relevance of the c-command domain, we will consider the following condition on the interpretation of personal pronouns (due to Reinhart 1976: 43)

(46) a. A personal pronoun should not c-command its antecedent.

Consider the examples in (47) and (48), where identity of subscripts indicates identity of the reference of the NPs, i.e. *co-reference*.

Sentences (47) and (48) can roughly be represented as in (49) and (50). Consider (47a) and (49). The personal pronoun *she* which is the subject of the subordinate clause may have the main clause subject as its antecedent. Condition (46) is observed, the pronoun does not c-command its antecedent, since the first maximal projection above the embedded clause subject is the subordinate S node, which surely does not dominate the main clause subject. Indeed, the coreferential reading is allowed and even likely. In contrast, in (47b) coreference between the two subjects is intuitively impossible (i.e. (47a) and (47b) are not synonymous); the coreferential interpretation is correctly ruled out by condition (46), since the main clause subject, *she,* in (47b) c-commands the subordinate clause subject, *Rosa,* which cannot be its antecedent in violation of (46). In sentences (48=50) neither NP_1 nor NP_2 c-commands the other; coreference is allowed, but optional.

(47) a. Rosa$_i$ complained that she$_{i/j}$ had a big headache.

b. She$_i$ complained that Rosa$_{i \cdot /j}$ had a big headache.

(48) a. People who know him$_{i/j}$ hate Nixon$_i$.

b. People who know Nixon$_i$ hate him$_{i/j}$.

(49) tree diagram

(50) tree diagram
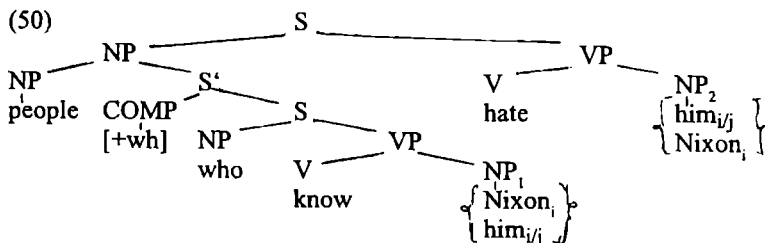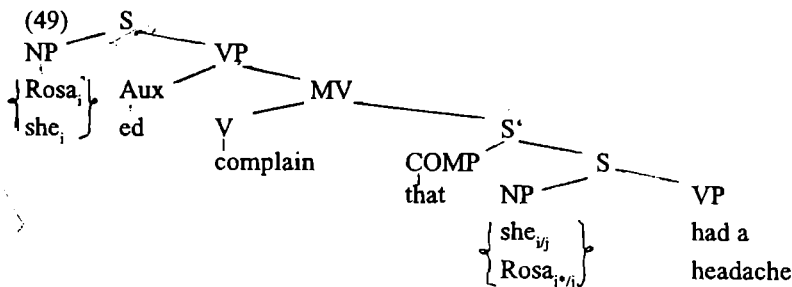
6.3. Government is a more local and therefore stricter relation between nodes than c-command. As a first definition of it, we offer (51) (where c-command may also be read as m-command).

(51)   <u>Government</u>
α governs ß iff
a. α is X^0, for some X (i.e.$X^°$ is a (lexical) head).
b. α c-commands ß.
c. For all maximal projections γ, if γ dominates ß, then γ dominates α.

What clause (c) of the definition says is that the governed term ß cannot be separated from the governing term α by any maximal projection; alternatively we may say that the head governor $X^{°(=α)}$ and the governed term ß are in all of the same maximal projections. Here are a few typical government configurations.

(52)   a.
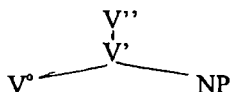
b.
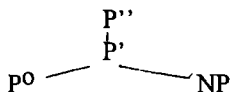
c.
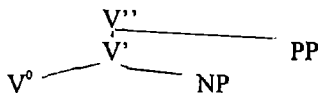
d.
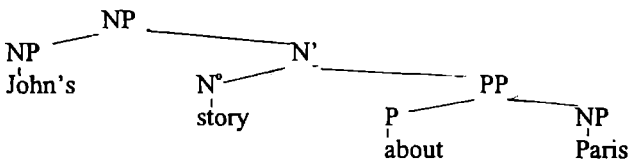
e.
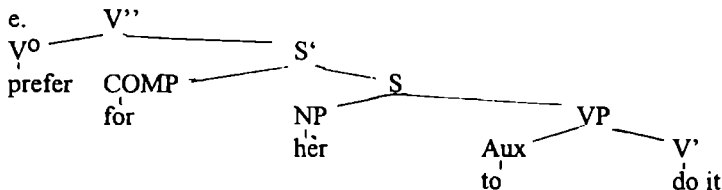
In (52a, b), the V^0, P^0 are lexical heads which strictlly c-command the sister NPs and very obviously no maximal projection intervenes between them; V^0 and P^0 govern the objects. In (52c) V^0 c/m-commands both the NP and the PP, and the first maximal projection dominating the NP and the PP, i.e. the V''; also includes the V^0; therefore the verb governs the NP and the PP. In (52d), N^0 governs the genitive in specifier position, since it c/m-commands it, and the first maximal projection above the genitive also includes the governor N^0. In (52e) we would like to say that the complementizer *for* governs the infinitive's subject since it assigns it case, but this

implies that the S projection is not maximal (while S' is maximal) (or that for some other reason the S projection does not block government).

Thus, what the definition of government in (51) says is that the governor should be higher in the tree than the governee, but still so close to it that no category of the wrong type, that is, no *barrier* intervenes. For some time, it was accepted that all and only maximal projections are *barriers*. Later research showed that under certain conditions, maximal projections are voided of barrierhood, that is, they do not block government or movement. Therefore, maximal projections are barriers only *relative to a context of occurrence*. This problem will be discussed in the coming lectures.

Meanwhile, we shall examine a few more complex configurations, which illustrate an important class of contexts where government is blocked, specifically, government between two nodes α° and ß is blocked, because there is another lexical head γ^0 which is "closer" to ß than α is; the maximal projection which contains the intervening governor γ^0 but does not contain α^0 is a barrier. Configuration (53) illustrates the idea of 'minimality' barrier, the idea that if two lexical heads might in principle qualifiy as governors of some projection, it is the nearest which is the actual governor. *In fact, only γ^0 in (53) satisfies clause (c) of definition (51)*; only γ^0 and ß are in *all* of the same maximal projection (i.e. in γ and α); α^0 is too far and there is a minimality barrier, γ' between α^0 and ß.

(53)

$$\alpha^0 \overset{\displaystyle \alpha}{\diagdown} \overset{\displaystyle \gamma}{\diagup} \quad \gamma^0 \diagdown ß$$

Consider structures (54).

(54)   a.

```
            V''
            |
            V'
      V⁰ ——————— PP
      |          |
    luptă        P'
           P⁰ ——————— NP₁
           |           |
      ⎧ pentru ⎫    ⎧ guvern    ⎫
      ⎨        ⎬    ⎨           ⎬
      ⎩ contra ⎭    ⎩ guvernului ⎭
```

b.

```
              NP
      NP ——————— N'
      |      N⁰ ——— PP
    John's   |       |
             |       P'
             |    P⁰ ——— NP
             |    |       |
           story about   Paris
```
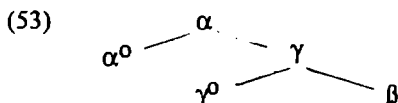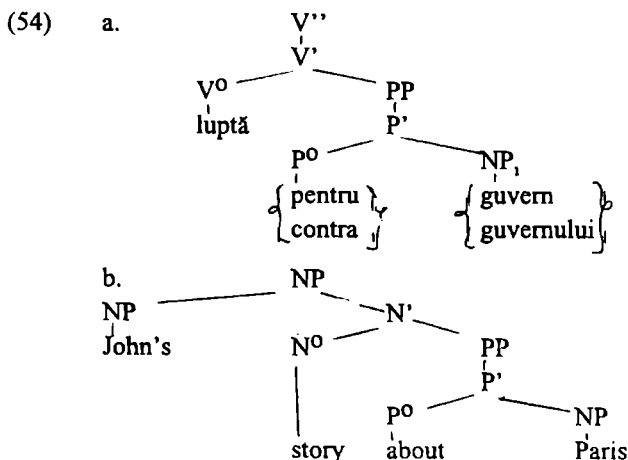
In (54a) although NPs may be governed by both verbs and prepositions, the bold NP is uniquely governed by the preposition; the PP node is a minimality barrier for government of the NP by the verb, since the PP includes the closer governor P^0 and excludes the verb. The Romanian examples, *Lupta pentru guvern/lupta contra guvernului*, clearly show that the preposition is the governor, since it is the preposition which assigns case to the NP (cf. the contrast *pentru guvern* (Acc) vs *contra guvernului* (Gen), and case is assigned under government. In the same way the noun head N^0 cannot govern within the domains of another governor, the preposition in (54b), so that the NP *Paris* is governed by the preposition *about*; the PP acts as a minimality barrier.

Concluding we may say that α^0 *governs β iff α^0 c-commands β and there is no γ such that γ is a barrier between α and β.*

Chapter 6

THEMATIC RELATIONS IN THE LEXICON

1. Introducing thematic relations.

The theory of thematic relations, or "case grammar", as one of its earlier version was called, is, for the most part, an aspect of semantic/conceptual structure, not part of syntax. Specifically, case grammar is a semantic theory concerned with the structure of events, function of their participants; therefore, case grammar deals with predicates (or predications) and their participant structure. Thus, the predicates *die/kill* both appear in event predications, both are change of state verbs, but they differ in that, while *die* is used only of the Patient that undergoes the change *(The dog died.)*, *kill* conceptually requires (at least) two participants, one is the Patient that suffers the change, i.e. that dies, the other is the Agent or Instrument that brings about the change. *The robber killed the accountant (with a gun)./ This gun killed the accountant. / The explosion killed the accountant./ *The accountant killed.* The verb expresses a certain relation between the argument NPs, which, depending on the meaning of the verb, are cast in various conceptual roles. A proposition (the term 'proposition' designates the meaning of a declarative sentence) minimally consists of a predicate (verb, adjective) and one or several NPs, each associated with the verb in a particular *conceptual/thematic role* or case-relationship. The combination of cases that may be associated with a given predicate is called the *role structure* of the predicate, or *case-frame*, or *thematic grid*, or *argument structure of the predicate* (there is considerable terminological variation).

Case grammar has been described as a "model of understanding", i.e., a theory about the way we *categorize experience* and comprehend discourses (cf. Carlson and Tannenhouse (1988). What is going on around us, the physical occurrences in the world are categorized as events/states/processes with a certain participant structure. As part of their considerable freedom to external stimuli, human beings have a great deal of latitude in the way they choose to describe an occurrence. For instance, the same physical occurrence - the same event - could be reported using any of the sentences in set (1), and the same is true about the sets in (2) and (3).

(1) a. He opened the window.
     b. He raised his arm.
     c. He moved his arm.
     d. His arm went up and touched the window.

(2) a. George bought flowers from the girl.
     b. The girl sold flowers to George.

(3) a. I pushed against the table.
     b. I pushed the table.

Choice of a particular verb amounts to a particular description of an occurrence as an act of buying or selling, of opening a window, of raising one's arm, etc. Choice of the verb is the major ingredient in "putting an event in perspective" (cf. Fillmore (1977). A second important factor in interpreting an event is choice of certain participants as fillers of the major grammatical functions: subject, direct object; this can be seen in (3); (3a) is a two-participant scene with a one-place perspective, meaning that it is the Agent's action itself that is central; in contrast, in (3b), both participants - the Agent and the locative phrase, a Goal - are in perspective, the locative constituent is sufficiently salient to become a DO, and unlike (3a), (3b) implies movement of the Goal.

As a *semantic theory*, Case Grammar has a two-fold interest: a) it offers a model of lexical analysis of predicates - it is, and it has been used as, a model of *syntagmatic* analysis for verbs and adjectives. The theory of thematic relations describes the lexical structure of a predicate with reference to the semantic interpretation of the NPs occurring with it. The speakers' knowledge of lexical concepts includes knowledge of the predicate's argument structure or case frame, that is, knowledge of the roles of the NPs that may, or must, be in construction with a verb or an adjective. b) From a cognitive perspective, a predicate with its roles represents a *proposition,* a particular conceptual configuration which might be viewed as an 'idealized cognitive model' (cf. Lakoff (1987)), a template which serves in the categorization and interpretation of events. Thematic relations offer therefore a means of event description and analysis. This analysis may be carried out at the microstructural level of the sentence/proposition, but also at the macrostructural level of textual analysis. Literary theories like those of Propp (1928) or Greimas (1966) make good use of thematic relations in the analysis of narratives.

If one examines the theory of thematic relations from the point of view of grammar, there are two types of problems that can be investigated:

a) One may study the way in which this facet of lexical structure passes into syntax or morphology. Therefore, one may deal with principles of subject or object selection, i.e. principles that determine the choice of a particular role as subject or as DO, especially when the predicate has several frames or syntactic constructions available: e.g. *One thousand people can stand in the hall* vs. *The hall can stand one thousand people.* More generally, one may examine problems of *case-linking,* that is, how case frames are pinned on subcategorization frames; related is the problem of identifying the role-assigning categories of a language and the direction of role-assignment; it then becomes important to distinguish between syntactic positions which can be assigned roles, i.e. *thematic or argumental* positions, and non-thematic positions. All of these form the domain of θ-Theory , one of the modules of UG.

b) The second range of problems, in some sense complementary to the first, is that of the linguistic regularities that go beyond syntax, which can only be stated or explained using case concepts (for instance, regularities in the use of prepositions, in the use of adverbs a.o.). It is problems of the second kind that constituted the initial motivation for case grammar.

In this and the next chapter, we will briefly present case grammar and its evolution, leading to the notion of *argument structure,* as a component of the lexicon,

and will pass on to a discussion of θ-Theory , which is the module of UG that deals with the integration of argument-structures in syntax.

2.Fillmore's Case Grammar.

The concept of case-structure is due to Fillmore (1968 - "The Case for Case", 1977 -"The Case for Case Reopened"), who is responsible for the big success of the theory in the early seventies. Major figures emerged to be Gruber, with his excellent *Studies in Lexical Relations* (1965*)*, Jackendoff (1983, *Semantics and Cognition*, 1987, 1991) Rappaport and Levin (1988). An influential British practitioner, the originator of what is called the 'localist' hypothesis is Anderson (1971) - *The Grammar of Case-Towards a Localistic Theory*. In case-grammar, thematic roles are concepts which express relations between the participants in an event. In Fillmore's words "the case notions comprise a set of *universal, presumably innate concepts* (emphasis mine, A.C) which identify certain types of judgments human beings are capable of making about the events that are going on around them, judgments about such matters as who did it, who it happened to, and what got changed" (1968).

The following is a list of thematic relations that have been found to be relevant in verb classification:

Agent (A) - the typically animate participant who is the initiator or doer of the action; he must be capable of volition (desire) or deliberate action and is usually responsible for the action. The subject is an Agent in (4a,c,d,e):

(4)   a. Judith hit Emily.
        b. A falling rock hit Emily.
        c. George accidentally broke the glass.
        d. Without meaning to, Fred insulted his sister.
        e. He deliberately walked out before the end of the lecture.

Judith is the Agent in (4a), but a *falling rock*, which is inanimate, is not an Agent. In particular instances, an Agent may or may not intend to perform an action, as shown in (4c-d). An Agent merely requires the *capacity* for volition, intention, responsibility. Adverbs like *willingly, deliberately, intentionally* count as typical identifiers of Agents.

Experiencer (E). The role of the animate being affected by the state or action identified by the verb, the locus of a psychological process, the individual who feels or perceives the event (e.g. the subject of *love, hate*, the Direct Object of *surprise, aware, frighten*, etc.).

(5)   a. Alan loves Mary.
        b. It seems to me that you are twisting my words.
        c. You surprised me with your theory.

Benefactive. The one for whose advantage the event took place.

(6) a. I did it <u>for him</u>.
b. I cooked <u>him</u> dinner.

<u>Goal</u>. The entity toward which motion takes place (examples (7 a-c)). A related role is <u>Source,</u> defined as the entity from which motion takes place. (example 7b).

(7) a. The plane can fly <u>to New York</u> in an hour.
b. He removed the book <u>from the shelf</u>.
c. <u>The radio</u> is sending messages into the air.

<u>Location</u>. The place where something is or takes place.

(8) a. He was lying <u>on the grass</u>.
b. He sat <u>in the armchair</u>.
c. <u>The kitchen</u> reeked of tobacco.

<u>Theme</u>. This term is the least consistently used of all thematic relations. Strictly speaking, the Theme occurs only with a verb of motion or location (of course, both motion or location can be concrete or abstract). With a verb of motion, the Theme is what moves. With a verb of location, the Theme is the entity whose location is being described.

(9) a. <u>The balloon</u> rose up.
b. I cannot move <u>this stone</u>.
c. <u>The ball</u> is on the sand.
d. <u>The glass case</u> stood against the wall.

The term 'Theme' was introduced by Gruber (1965), in the description of motion and location in English. Over the years, the term Theme has come to be used as a kind of default thematic role, the label to be given when no other label seems to fit; the term was, and is, still used to describe the entity that undergoes a change, or the entity which is perceived. More specialized terms. like 'Patient', or 'Precept' have also been created for such "subtypes" of themes:

<u>Patient</u>. An entity which suffers an action, undergoes a change.

(10) a. The dog hit <u>the child.</u>
b. The arrow hit <u>the apple</u>.
c. The president fired <u>the treasurer</u>.
d. <u>The window</u> opened.

<u>Precept</u>. This term has of late been used to designate the entity which is experienced or perceived.

(11) a. Susie saw <u>the monster</u>.
b. It seemed to Oliver <u>that there would not be enough food</u>.
c. <u>The stories</u> frightened the children.

Instrument. This is a clearer concept, designating the object with which an action is performed.

(12)   a. We cut the meat with a knife.
        b. I was impressed by this speech.
        c. This key will open the door.

Path. The trajectory that an object covers.

(13)   a. He walked along the street.
        b. He ran through the tunnell.

This list is neither exhaustive nor definitive; indeed, different researchers have come up with very different case lists (compare, for instance, Fillmore and Anderson) and it has been a major difficulty of this theory that it offered no empirical or theory-internal arguments for deciding what cases there were and how many, with any reliability. However, it is but fair to say that the descriptions above were not offered as definitions of the thematic roles, but were thought of as the kind of interim rough and ready intuitive characterization that linguists sometimes give to those concepts that are acknowledged to be real in NLs, but whose precise theoretical explanation is complex and still controversial.

The examination of the list above reveals however an important idea. Roles are *relational*, not inherent, *concepts. Roles acquire substance only in the context of the predicates that require them.* This was clearly seen in the attempt to define 'Theme', as the need was felt to distinguish between, first, "object of motion", i.e. Theme which is an argument of a change of location verb,secondly, " object of change", i.e. Theme or Patient, which is an argument of change of state verb, thirdly, "object of perception", i.e. Theme or Percept, which is an argument of a psychological verb (e.g. *The apple fell down / He cut the apple / He saw the apple).* As will be seen later, roles are read off from the meaning of verbs, from their *lexical conceptual structure*(=LCS).

Two other facts are clearly illustrated in the examples above: First, there is no systematic correspondence between roles and morphological cases, or between roles and syntactic functions. Thus, the Nominative case, and, therefore, the subject function may correspond to an Agent in (4), to an Experiencer in (5a), to a Source in (7b), to a Location in (8c), to a Theme in (9a,c,d), to a Patient in (1d), to a Percept in (11c), to an Instrument in (11c). Conversely, most roles surf in more than one morphologic case, having different syntactic functions. For instance, the Experiencer is a Nominative Subject in (5a), it is a Dative Indirect Object in (5b) and an Accusative Direct Object in (5c), etc. Secondly, since morphologic case and syntactic function seldom identify a semantic role, the more explicit markers of roles, particularly in languages with an impoverished morphology like English are prepositions. The Agent preposition is by, as found in the Passive (e.g. *The play was authored by Shakespeare).* The Instrument preposition is *by,* if there is no Agent (cf. (12b)); otherwise it is *with* (12a). The

Experiencer preposition is *to* (cf. (5b)). The Source preposition is *from* (7a), the Goal preposition is *to* (6a). There are no typical prepositions for the Theme.

2.1. Lexical entries for verbs. As part of lexical competence, if a speaker knows what a verb means he also knows what roles are borne by the NPs it combines with, i.e. he knows how the NPs in relation to the verb are understood. This knowledge is stored in the mental lexicon, and it is part of a predicate's lexical entry in the grammarian's lexicon.

The earliest representation of the roles associated with a verb assumed the form of an *unordered set of roles*, some of which were shown to be optional. Fillmore (1968) proposed the following lexical entry for the verb *break*, taking into account the paradigm in (15).

(14)   Break: <(Agent), Patient (Instrument)>

(15)   a. John broke the window with a hammer.
        <Agent, Patient, Instrument>
        b. The hammer broke the window. <Instrument, Patient>
        c. The window broke. <Patient>

Other change of state verbs that pattern like break are bend, shatter, crack, fold, melt, and many more.

(16)   a. The glass shattered.
        b. John shattered the glass.
        c. The wind shattered the glass.
        d. John shattered the glass with a hammer.

The case frame (14) says that break needs at least one argument cast in the role of Patient and that it may optionally take an Agent and an Instrument alongside of the Patient.

The notion of optional case/role is not the same as syntactically deleted/unlexicalized object. An NP which is an empty category is retrievable at the level of Logical Form, and it is somehow represented, though it is not present at the level of Phonological Form; a semantically optional case will not be represented at any syntactic level (D-structure, S-structure, LF). Consider the following examples involving the verb cook. Cook is understood as a binary predicate in both of (17a,b), though the Direct Object is an empty NP in (17b). It is only in (17c) that cook has only one semantic role, Theme, the Agent being an optional role for this verb.

(17)   a. Mother is cooking the potatoes. <Agent, Theme>
        b. Mother is cooking [e].   <Agent, Theme>
        c. The potatoes are cooking.   <Theme>
        d. cook: <(Agent), Theme>

The earliest attempts to relate argument structures and syntax were concerned with setting up principles for the selection of Subjects and Direct Objects, out of the unordered sets of roles that made up the verb's argument structure. One of the earliest and most significant facts noticed by Fillmore (1968) was that for each class of verbs there is a preferred or 'unmarked' subject choice. For the change of state verbs <(Agent), Theme, (Instrument)>, the following subject selection principle operates:

(18) If there is an Agent, it becomes the Subject, otherwise, if there is an Instrument, it becomes the Subject, otherwise the Subject is the Theme.

This principle is at work in examples (15)-(17). Moreover, this Fillmorian principle is likely to have suggested an idea which is the cornerstone of current research in thematic relations, namely the idea that some roles are more prominent than others, and that grammatical processes are sensitive to the relative degree of prominence of roles, not to their intrinsic semantic content.

3. The thematic domain of movement and location.

Ever since Gruber's seminal study, the semantic domain of movement and location has been a focus of research for a considerable number of analysts within Case Grammar and, later, 'thematic theory'; the findings of these insightful studies are impressive and their conclusions are far-reaching, they fully illustrate the kind of linguistic explanation that can be given within this semantic model (cf. Gruber (1965), Miller (1972), Givon (1976), Jackendoff (1983, 1987, 1990), Emonds (1989) a.o.). We can only illustrate a small portion of the data, but hope to give an idea of the types of reasoning and concerns in this area. This research is explicitly viewed as an investigation of 'conceptual structure' (cf. Jackendoff (1987)); to study conceptual structure is to study categorization and concept formation, to study the way concepts are stored in the mental lexicon, so that inferential relations between concepts, and then, between the lexical items that express these concepts, are made available. In the mental lexicon, lexical items are associated with lexical conceptual structures (LCSs), which are conceptual configurations that represent the meaning of an item ,in a way that shows the relation between that item and other items in the lexicon. The LCS in the grammar's lexicon is a hypothesis on the way the meaning of the word is represented in the mental lexicon.

It is generally agreed that concepts are organized in semantic fields or *frames*. Role-concepts come from several major semantic fields, such as the field of movement and location (Theme, Source, Goal, Path, Location etc.), the fields of human action and causation (Agent, Instrument, Patient/Theme, Cause, etc.). Concepts may have complex structure, with inter-relating subcomponents belonging to different fields, this may be one reason why the same entity may be interpreted as performing two non-contradictory roles, in the same event.

3.1. Let us first consider a few basic intransitive verbs of movement like: *move, travel, come, go, run, walk, fly, swim, float, roll.* These verbs imply the presence

of a Theme which changes location with respect to some reference objects, which are the object from which the Theme moves, i.e. the Source constituent, or the object toward which the Theme travels, i.e. the Goal constituent. The most general prepositions are FROM for Source and TO for Goal. For intransitive verbs of movement, the Theme is selected as subject:

(19) a. The letter went from New York to Philadelphia.
      b. The message travelled from Bill to Alice.

For some transitive verbs of movement, the Theme surfaces as a Direct Object as in (20) below; the Subject of (20a) is a Source, while in (20b) it is a Goal.

(20) a. The radio sent messages into space.
      b. The dog caught the ball from the boy.

The Source-Goal expression may be more complex, the reference object may be conceptualized as a place, rather than a point (i.e. it is linguistically a PP, not an NP).

(21) a. The horse galloped from in front of the house to the fence.
      b. The bird flew from above the house to above the tree.
      c. John ran from under the shed into the house.

Choice of a particular Source-Goal preposition imposes constraints on the nature of the reference objects. *To* and *from* conceptualize the Goal and the Source as points. When the Source and Goal are conceptualized as surfaces, the prepositions are *off of* for Source, and *onto* for Goal, while for volumes, the prepositions are *out of* (Source) and *into* (Goal) :

(22) a. The insect crawled off of the table onto my knee.
      b. He ran out of the house into the rain.

In the examples given so far, the Goal expression contained to, or some compound preposition, *onto, into,* encapsulating *to* (*onto* = TO ON, *into* = TO IN). It is known that English explicitly distinguishes between Location and Goal in the case of *at* (Location) vs to (Goal). Other spatial prepositions may express either Goal or Location: *below, in front of, behind, before, under* a.o.

(23) The mouse is under the table / behind the screen.

(24) a. The mouse ran under the table.
      b. The balloon flew above the first floor.
      c. She ran behind the screen.

All of (24) imply TO, (24a) might be paraphrased as 'the mouse ran to a place under the table'. Significantly, *from,* the correlative of TO, cannot be 'deleted' and will appear if any of (24) are rephrased as to contain a Source expression.

(25)   a. The mouse ran from under the table.
        b. The balloon flew from above the first floor.
        c. She ran from behind the screen.

The Source-Goal complex defines a Path. Paths can be divided into three broad types, according to the relation between the path and the reference object: a) There are 'bounded paths' , when the reference object is an end point of the path. This is the case discussed so far, with the Source and Goal reference Objects marking the boundaries of the path. b) There are 'directions', in which case the reference object does not fall on the path, but would do so if the path were extended for some unspecified distance. The Goal preposition *toward* is a directional preposition; *away from* is a Source directional preposition, and verbs like *head, make for* always take a directional path. Compare:

(26)   a. John ran to the house. (bounded path, the house is reached)
        b. John ran toward the house. (directional path, the house is not reached)
        c. John ran away from the house.

English possesses several adverbial particles that show direction: *upward, downward, forward, backward* a.o., and also adverbial phrases like *homeward, oceanward* (e.g. *to be bound homeward*), etc. c) Thirdly, paths may be 'routes'; in this case, the reference object or place is merely related to some point in the interior of the path; typical prepositions for routes are *by, along, over, via, through, part, across*.

(27)   The car passed by the house.
        The man ran along the river.
        The train ran through the tunnel.   •

The Goal constituent may be quite complex for instance by including a route and an endpoint:

(28)   a. He ran through the door into the bedroom.
        b. The horse galloped across the bridge onto the field.

· 3.2. We will now briefly examine a few verbs that incorporate certain expressions of goal, source or direction, and which consequently are more limited in their distribution; such are the following verbs expressing movement along the vertical dimension: *rise, fall, ascend, descend*.

The verbs *rise/fall* signify movement upwards/downwards, and direction is either mentioned explicitly or incorporated as part of the Goal constituent. Compare *rise/fall/go*.

(29)   a. The balloon rose up/went up (from the ground).
        b. The balloon was *rising down/going down.
        c. The balloon was falling (down)/going down (to the ground).
        d. The balloon was *falling up/going up.

Rise/fall optionally incorporate the directional particles up/down which are always present in their conceptual environment. Their meaning is more specific and their distribution more limited than that of the generic verb *go*. The Goal may be accompanied by a Path and a Source constituent.

(30)   a. The package rose (up) on the conveyor belt.
          b. The package rose up the conveyor belt.
          c. Bubbles rose to the surface from the bottom of the lake.

(31)   a. The ball fell into the water.
          b. It fell down through the chimney.
          c. He fell off his horse.

The verbs *ascend/descend* also signify movement along the vertical dimension. They are more complex and thus distributionally more restricted than *rise/fall*. They always incorporate the directional goal particles *up/down*, so that now not only (32a,b) are ill-formed but so are also (32c,d).

(32)   a. *John ascended down.
          b. *John descended up.
          c. *John ascended up.
          d. *John descended down.

But *ascend/descend* also incorporate a specification of a Path component, therefore, they incorporate an expression of type [UP/DOWN ON] NP.

(33)   a. John ascended the stairs [= went [up on] the stairs]
          b. John descended the stairs [= went [down on] the stairs]

Climb is not restricted to vertical movement, but when it expresses movement up, it may optionally incorporate [UP ON] NP like ascend. Thus, in general, climb simply indicates a kind of groping movement, perhaps using one's hands, but in any direction. But when there is no preposition and the verb is transitive, only UP ON can be understood (cf. 34d).

(34)   a. He climbed down the ladder.
          b. John climbed into the tent.
          c. John climbed along the steep path.
          d. John climbed the ladder/the wall [= went up on the wall]

The difference between the sentences in (35) should be easy to grasp now.

(35)   a.??John rose quietly (for an hour).
          b. John ascended quietly (for an hour).

Sentence (35b) entails that John was going up along some object or path such as a stair, a wall, etc., because *ascend* incorporates a Path component. Sentence (35a),

with *rise*, does not imply any such object. Hence the sentence is somewhat ludicrous, implying that John is floating upwards.

Finally, <u>sink</u> is a verb that specifies its Goal as downwards and may also incorporate a significant Source point.

(36) a. The rocks sank onto the floor of the tub. [The rocks went down FROM THE SURFACE onto the floor of the tub]
.   b. The foundations have sunk.

Notice the following minimal pair, due to Gruber (1965), where only the second sentence is natural, because it incorporates a source point.

(37) a. The ship fell suddenly.
b. The ship sank suddenly.

The hypothesis of incorporation then explains subtle syntactic facts, related to the distribution of particles, but also to the transitivity vs intransitivity of certain related verbs (cf. *rise / ascend / climb* or *fall / descend*. Generalizing with Talmy (1975), from a cognitive psychological perspective, one may say that the conceptual sphere of movement and location simply involves a relation of relative <u>prominence</u> between an object or Figure (which moves or which is focused upon) and a Ground.

3.3. As already mentioned, a second conceptual sphere of interest in verb classification is that of action and causation. Some of the roles involved are Agent, Patient, Instrument, Cause.

(38) a. John washed his shirt with detergent.
b. The earthquake badly damaged the house.

The generic verb in the action field is ACT or DO ('x acts (on y)', (cf. Ross (1976), Jackendoff (1987)), involving an Actor (Agent or Instrument/Cause) and an optional Patient/Theme.

Coming back to the verbs of motion/location, it appears that the action and movement tier may combine in the meaning (LCS) of predicates, which thus express movement induced by an Agent/Instrument/Cause. There are dozens of non-causative/causative pairs of verbs of movement; the same lexical form may be used, there may be morphologically related pairs, or there may be lexically different roots. Here are a few examples, illustrating these possibilities:

(39) a.   The ball rolled down the hill.
         He rolled the ball down the hill.
     b.   His voice lowered to a whisper.
         He lowered his voice to a whisper.
     c.   The plane flew.
         She was flying the kite.

d.   The sunken ship rose to the surface.
       They raised the sunken ship to the surface.

e.   The trees fell down.
       They felled the trees down.

f.   Simon came into the room.
       I brought Simon into the room.

g.   The ball went out of the window.
       The boy threw the ball out of the window.

Causative verbs of movement have a more complex role structure:

(40)   *drop, lower, roll, sink,* →
          <(Agent) (Instrument) (Source) (Goal) Theme/Patient>

When there is no Agent/Instrument/Cause, the verb is used intransitively. While in all the examples given so far, the Agent or Instrument is understood as a 'sufficient cause' for movement, using contrasts like those in (41) below, Gruber (1965) also motivates a second kind of agency, called <u>permissive agency</u>. A permissive Agent simply does not obstruct movement, but lets it occur.

(41)   a.   The rock went down the cliff.
              The bird flew out of the cage.
              Sam ran around the tree.

       b.   Bill pushed rock down the cliff.
              Bill removed the bird from the cage.
              Bill made Sam run around the tree.

       c.   Bill dropped [= let fall] the rock down the cliff.
              Bill released the bird from the cage.
              Bill let Sam run around the tree.

Examples (41b) illustrate causative agency, while sentences (41c) offer instances of permissive agency. One more interesting point in the analysis of causative verbs of movement is that since the Agent/Instrument is a causer of movement it may produce movement to him or away from him, so that the causer of movement will simultaneously count as the Goal or the Source of movement. The same entity performs two non-contradictory roles.

(42)   Agent/Instrument as Source
       a.   I threw the ball at him.
              The radio sends message into space.
              Agent/Instrument as Goal/Location
       b.   Bill caught the ball.
              Bill kept the ball.

It is part of the lexical meaning of certain verbs (*throw, fling, kick, catch, drop, keep*, etc.) to specify which one of the PPs (Source or Goal) may or must coincide with the causer of movement (Agent, Instrument).

4. Non-spatial semantic fields.

The great insight of Gruber (1965), taken up by Jackendoff (1983, 1987), Lakoff (1987) a.o. is that the semantics of motion and location provide the key to a wide range of further semantic fields. Fields differ in the following way (cf. Jackendoff (1983)): a) what sorts of entities may appear as Theme; b) what sort of entities may appear as reference objects; c) what kind of relation assumes the role played by movement/location in the field of spatial expression.

The hypothesis of the conceptual similarity of the fields is supported by formal similarities manifest across apparently unrelated domains, in the use of the same syntactic and lexical patterns, particularly the use of the same prepositions and even the same verb.

41. Alienable Possession and Change of Possession. Oversimplifying, we may describe this field as follows: a. Things appear as Themes. b. Things, in fact both people and objects, appear as reference objects in the Source, Goal, Location constituents.c. The relation that corresponds to location is 'being alienably possessed', that is 'x has / possesses y' is the conceptual parallel of 'Y is at x'. The relation corresponding to change of location from Source to Goal is change of 'possession'. Notice the occurrence of spatial prepositions with verbs of possession like belong.

(43)   a. have, own, possess: <Theme, Location (Possessor)>
        b. Beth has / owns / possesses a nice doll. (i.e. , The doll is at / with Beth.)
        c. The doll belongs to Beth.
        d. The cookies belong in the jar.

'Change of possession' appears as movement from one possessor to the next. All the change of possession verbs are ditransitive verbs. The Theme is constantly realized as a DO. Either the Source or the Goal is chosen as Subject, and it is also interpreted as the causer of the deal, i.e. as an Agent. The third participant will be a Goal / Source with a characteristic preposition.

(44)   a. He deliberately sold the fake to his rich uncle.
        Source/Agent   Theme   Goal
        b. Mr. Smith inadvertantly bought this fake from his nephew.
        Goal/Agent   Theme   Source
        c. sell: <Source/Agent, Theme, Goal>
        d. buy: <Goal/Agent, Theme, Source>

Just as in the field of concrete movement, abstract movement may be non-causative, or may result from causative, or merely permissive, agency:

(45) a. non-causative transfer of possession
John won a fortune from Mary / on the pools.
John lost the book to Bill.
b. causative transfer of possession
He seized the book from Jane.
He skilfully acquired this piece of information from me.
He bought this painting from a cousin really for nothing.
He passed the cookies to the guests.
c. permissive causation
We offered flowers to the guests [offer = let have]
Amy gave up / relinquished the doll to her sister.
Beth didn't accept the diamonds from her sister.

The consistent use of the Source-Goal prepositions FROM-TO with verbs expressing change of possession supports the idea that change of possession is a case of metaphorical movement. At the same time, the field of possession has also developed formal means that are characteristic of it. Thus the [+Personal] Goal, involved in 'transfer of possession' deals, may be expressed in two ways in English: either by using the Goal preposition *to*, or by using a specific "recipient" construction; in fact, some authors have proposed that there should be a case called Recipient "which is a subtype of the *Goal* thematic relation and occurs with verbs denoting change of possession such as *give, offer*, etc." (Cowper 1992: 49).

(46) a. We gave a present to George.
b. We gave George a present.
c. We sent the rocket to the Moon.
d. *We sent the Moon the rocket.

English thus, on the one hand shows the relatedness between 'change of position' and 'change of possession' employing a common Goal preposition; and on the other hand, it also indicates the difference between them, disposing of a typical 'change of possession' pattern (cf. the contrast between (46b,d)). Other languages, like Romanian, Russian, a.o., stress the dissimilarity between Goal and Recipient, by assigning different morphological cases: Dative for change of possession, and a prepositional construction for movement.

(47) a. Am mers la primărie. (change of location)
b. Am dat flori primarului. (change of possession)

(Of course, in informal Romanian, the Recipient may also be expressed with the Goal preposition *la: Nu le-a dat bani la oameni.*) At the opposite end of the scale from Romanian, Finnish uses only a Goal directional construction for both Goal and

Recipient (cf. Dahl (1987)). It is really unpredictable which of the conceptual similarities between fields will be backed up by formal similarities in individual languages.

4.2. The second non-spatial field where the Source-Goal pattern functions systematically is that of *identification*, which deals with the categorization and ascription of properties, and also with changes of status. Using the model suggested by Jackendoff (1983), one might describe this field as follows: a. Things (objects and people) appear as Themes. b. Types of things and properties (NPs or APs) appear as reference objects. c. Being an instance of a category, or having a property, and changing one's status are the analogues of location and motion respectively.

We will examine only a few verbs of "abstract movement" from one state into another: *turn, change, convert, transform, fall, become, grow, go.* Some of them exhibit the full Source-Goal construction. Notice the use of spatial prepositions.

(48)   a. John decided to turn from a loyal patriot to a redcoat.
         b. He converted from a Protestant to a Catholic.
         c. Suddenly, the coach changed from what it was into a pumpkin.
         d. The little house transformed from what it was into a palace overnight.

Often, only the Goal expression occurs. It may contain TO or INTO; according to Gruber (1965), TO often indicates non-permanent, superficial change, while INTO may suggest complete, permanent change.

(49)   a. The light changed to green.
         b. The icecream changed to a liquid.
         c. They fell to blows.
         d. They fell into silence / into despair / into poverty.
         e. John converted into a dwarf / *to a dwarf.
         f. He came to power.
         g. He came into a fortune.
         h. He went into a fit / out of power.
         i. He is going from bad to worse.

The Goal preposition may be incorporated, under specific circumstances, for verbs like *turn, fall, go* and always for verbs like *become.*

(50)   a. John turns cook when his wife is away.
         b. His complexion turned a funny shade of green.
         c. Bill turned a too large weight.
         d. He fell heir to his uncle's estate.
         e. She fell an easy pray to him.
         f. He went mad.
         g. He became a doctor.

4.3. Conclusions of the analysis:

a) The study of the verbs in each subdomain evinces a high degree of systematicity in the organization of each field. The discussion in terms of case frames or role structures proved fruitful in making explicit important semantic similarities between the lexical items of each field. Subtle differences in the meaning and the syntax of these verbs could also be explained, as reflecting different role structures or a different use of mechanisms like incorporation (think of pairs like *rise/ascend, fall/sink* etc.). b) The analysis revealed the conceptual similarities between three different semantic domains: location and movement, possession and change of possession, being and becoming. The conceptual similarity accounts for the quite considerable formal similarities in the three domains, manifest in the use of the same lexical patterns, the use of the same prepositions and sometimes even the use of the same verbs; indeed, we find that some verbs occur in all three fields (e.g. *go: He went out of the room, The estate went to the eldest son, He went out of his mind*), many occur in at least two (*come, grow, turn, run* etc.), while others are specific to only one field (*donate, become, roll*). c) The amount of formal support for these conceptual similarities *is not predictable* and varies from one language to another. Emonds (1989) claims that at least with respect to these fields Germanic languages are more transparent than Romance languages. d) A fact of considerable interest is that these conceptual and formal similarities between lexical domains reveal the existence of widespread systems of metaphor in language and thought. Actually a stronger claim can be put forth: the field of spatial location and movement has *cognitive priority* - it serves as a model in the conceptual organization of other fields. If there is any primacy to this field, it is because the spatial field is strongly supported by *nonlinguistic cognition*; the human person's location and movement in space provide the common ground for the essential faculties of vision and touch (and also for action) which may all interact with the language faculty. This means that "in exploring the organization of concepts which, unlike those of physical space, lack perceptual counterparts, we do not have to start *de novo*. Rather, we can constrain the possible hypotheses about spatial concepts to our new purposes. The psychological claim behind this methodology is that the mind does not manufacture concepts out of thin air. Rather it adopts structures which are already available" (Jackendoff, 1983: 89). The study of language can offer an insight into concept formation - a problem of cognitive psychology.

5. Integrating role-structure in syntax.

5.1. Since thematic theory appeared to be saying something essential about language, it was thought highly desirable to systematically relate it to syntax and morphology, making it part of formal grammar. The earlier attempts at integration (due to Fillmore (1968) or Anderson (1971)) simply projected case-frames as deep structures, and proceeded through rather complex and arbitrary transformations to derive the surface structures.

In GB theory, the integration of the argument structures from the lexicon in syntax, was primarily viewed as "linking", a mechanism by which thematic roles are correlated with subcategorization frames and ultimately with subcategorization positions in the PM. Setting up linking principles falls within the GB theory of θ-relations; the θ Theory module. It should be understood from the start that, from the point of view of the various syntactic processes, what counts is to distinguish between θ-marked positions in the PM and non- θ-marked positions. Any syntactic position capable to receive a θ-role is an <u>argument</u> position (=A-position), and any NP filling an argument position is an <u>argument</u>. Therefore, the subject and objects are the arguments of the verb.

A predicate θ-marks all the syntactic positions for which it is subcategorized; thematic-roles index the syntactic positions in the subcategorization frame, and the latter shows how the θ-roles are morpho-syntactically coded. Any NP occupying the respective position will be given a thematic index, and will thus be thematically identified. The roles in the predicate's θ -grid match the subcategorization frame.

(51)   I borrowed the book from a friend.
borrow   <Goal /Ag, Theme, Source>   a-structure
                [-- NP PP]   subcategorization frame
            I like roses.
like   <Experiencer, Theme>   a-structure
        [- NP]   subcategorization frame

One argument of each verb does not fall within the domain of subcategorization, namely the subject; its θ-role remains unlinked. The subject is referred to as an *external argument*, while the objects, which are *inside the subcategorization frame and dominated by the first projection of the head are called internal arguments*.

(52)   S
    NP   VP
        Aux   V
        V⁰   NP   PP
                    P   NP

The terms internal/external argument are due to Williams (1980) and have to do with his theory of *predication*. A *predicate*, in Williams' view, is an unsaturated maximal projection (having just *one* open position). A *subject* is then defined as an NP which is *external* to the VP and which c-commands it (as in (52)).

.Marantz (1984) suggests that the difference between the external and the internal argument also lies in the manner of θ-role assignment. He proposes (correctly, we believe) that the verb (or any other predicate) can directly θ-mark only *one*

argument, this is the *direct argument*, the Direct Object. The other internal arguments, which are PPs in English, are jointly assigned their θ-roles by the preposition and the verb. They are *indirect_arguments*. Remember that subcategorized prepositions are selected and governed by verbs and this allows verbs and prepositions to jointly θ-mark an argument. Thus, in *He looked for_the child* (=He tried to find the location of the child), *the child* is assigned the Theme role (as can be seen from the paraphrase) jointly by *look* and *for*. (In languages where indirect arguments can also be realized as oblique cases, θ-marking is achieved by the verb in conjunction with the oblique case-ending; it is a property of oblique endings (Dative, Ablative, Instrumental, etc) that they express a limited number of related roles; the verb selects one of the available possibilities. Thus the interpretation of the Romanian Dative as Recipient/Experiencer/Benefactive/Goal will depend on the choice of the verb.

(53) a. Copiilor le plac bomboanele. (Experiencer)
      b. Le-a dat bomboane copiilor. (Recipient/Goal)
      c. Le-a cumpărat bomboane copiilor. (Benefactive)

In contrast with the internal arguments which are directly or indirectly θ-marked by the verb under government, the subject role is assigned by the VP (the maximal V-projection), under *predication*. The content of the whole VP is relevant for the way the subject is understood. Consider the way in which the Agent role is interpreted in the sentences below:

(54) a. He threw a ball.   (54') a. He killed the cockroach.
      b. He threw a fit.   b. He killed a bottle.
      c. He threw a party.   c. He simply killed the audience.
                          d. He killed the conversation.
                          e. He killed the evening.

The examples show that, *for the same verb*, what the bearer of the Agent role is supposed to do to qualify as an Agent varies considerably. The interpretation of the Agent/subject depends not only on the verb, but on the combination verb+objects; we say that the interpretation of the subject role is *compositional*.

5.2.Several researchers proposed that it was possible to express the difference between the external argument and the internal arguments, as well as between the direct argument and the indirect arguments on the θ-grids themselves, for instance as shown below:

(55) give   Source/Agent <Theme, Goal>
      put   Agent <Theme, Location>
      frighten   Theme <Experiencer>

The role outside the angled brackets is the external argument, i.e., the subject. The underlined role inside the brackets is the *direct argument* i.e., the

(non-prepositional) direct object. A new conception of thematic grids has emerged. Thematic grids like (55) are not only sets of roles, but they also give syntactic information about the coding of these roles. They assume, at least in part, the function of subcategorization frames. This raises the question of whether subcategorization frames are still necessary. We will come back to this question in the next chapter. The importance of representations like (55) was that they stressed the idea that the θ-*grid was structured* ,in the sense that certain roles *are more_prominent* than others. In (55), prominence is directly linked to syntactic coding as Subject/DO/other. Other ways of understanding relative prominence among roles have also been proposed (see next chapter).

6. Where do θ-roles come from?

Throughout the discussion of θ-roles, we mentioned one difficulty that was encountered: this is the lack of formal criteria for reliably determing whether an NP does or does not bear a certain θ-role; one does not possess reliable definitions for cases, nor can one establish with any certainty how many different cases there are. Is Recipient the same role as Goal? Is Patient the same as Theme? The difficulty to use role labels consistently only sharpens, if we attempt to directly provide subcategorial information on θ-grids, as done in (55).

In this section, we present a rather radical solution to this problem, adopted by most researchers in the field (Jackendoff (1983) (1987), Rappaport and Levin (1988), Zubizaretta (1987), Speas (1990) a.o.) - *the solution amounts to giving up role labels as theoretically significant constructs*. It is claimed that thematic roles are not primitives of *semantic* theory. They are inferred from the meaning (= "lexical conceptual structures" = LCSs) of the predicates and they represent recurrent conceptual configurations (verb components) in the meaning of predicates. Role labels are abbreviations for such configurations, but have no other theoretical significance. The meaning of the verb imposes certain conceptual constraints on the participants. These conditions, which follow from the meaning of the verb, define the roles. Each role is, therefore, a set of entailments endorsed by the meaning of the verb.

6.1. We will now look at an example of how roles are read off LCSs and why this is a preferable solution. The argument is that role labels do not have sufficient explanatory power in themselves. Consider the so-called 'locative alternation' exhibited by verbs like *spray, load, plant, cram, stuff*, etc.

(56)   a. Jack sprayed paint on the wall. (locative variant)
        b. Jack sprayed the wall with paint. (<u>with</u> variant)

(57)   a. Bill loaded cartons onto the truck.
        b. Bill loaded the truck with cartons.

(58)   a. Bill crammed food into the freezer.
        b. Bill crammed the freezer with food.

(59)   a. Bill stuffed feathers into the pillow.
        b. Bill stuffed the pillow with feathers.

The (a) and (b) sentences in each pair seem to describe the same event: they each involve an entity or a substance coming to be at a particular location through the action of an Agent. Let us (tentatively and temporarily) refer to their arguments as *Agent, Locatum* (or *Theme* in change of movement predications, but not in change of state predications) and *Goal* (cf. Rappaport and Levin (1988: 19)). Considering the near-paraphrase relation between the two variants, it would be desirable to say that they represent the same theta-grid, say (60) below.

(60)   *load* <Agent, Locatum, Goal>

On the other hand, if we want to give information about the syntactic coding of the arguments, two different θ-grids must be proposed, in view of the different direct argument choices in the two sentences of each pair. The possibility of using distinct role structures gains support from the observation that there is a systematic difference of meaning between the two variants. Namely, when the Goal argument is realized as a Direct Object, it is understood as being wholly affected by the action denoted by the verb (i.e. the whole wall is sprayed with paint in (56b)). When this argument is realized as the object of a preposition, a partially affected interpretation is also possible. Thus, in (57b) the truck is full of cartons, but this is not necessarily so in (57a). Let us see what role structures may best represent the meaning difference between the two variants.

The locative variant (57a), namely, the varianty with a locative preposition, exhibits a familiar lexical pattern: the pattern of a verb of movement (where the Agent is also a metaphorical Source); and then, using *Theme* in Gruber's sense (entity that moves) or *Locatum*, the locative variant can be represented as in (61a) or (61b).

(61)   a. Agent <u>Theme, Goal</u>
        b. Agent <u>Locatum, Goal</u>

To determine the role structure of the second variant, the so-called *with* variant, one may capitalize on the semantic difference presented above, and describe the event in the second sentence as a *change of state*, rather than, simply, change of location, involving an Agent, *an affected entity*, that is, a Patient or Theme (=the former Goal), and the entity that gets moved in the process, the Locatum (or *displaced Theme*, as some analysts have called it, to suggest that this Theme does not appear in its expected Direct Object position). The role structure assigned to the *with* variant might be (62):

(62)   Agent <u>Patient/Theme, Locatum</u>

6.2. However, on closer inspection, any account of the *spray/load* alternation which relies on two θ-role lists is seriously flawed. In the absence of a clear definition of Theme/Patient/Locatum, the two lists might be regarded as just another way of encoding the fact that either the Goal or the Locatum of the unique list in (60) may be

associated with the direct argument variable. Worse, when the two variants are assigned different thematic structures, the ability of the analysis to capture the near-paraphrase relation between them is lost. Finally, as we now discuss in more detail, the two θ-role lists also hide the relation between *spray/load* verbs and another verb subclass exhibiting the locative alternation: the *clear* verbs (*clear, empty,* etc.).

Like the *spray/load* verbs, the *clear/empty* verbs allow two alternative realizations of their arguments:

(63)   a. Mary cleared the dishes from the table. (locative variant)
          b. Mary cleared the table of dishes. (*of/with* variant)
          a. Mary emptied water from the tub.
          b. Mary emptied the tub of water.

The members of this subclass are in some sense the semantic inverses of the *spray/load* verbs, since they denote the *removal* of a substance or entity from a location by an agent. We might show this by analysing both variants or at least the locative variant as in (64).

(64)   clear: Agent <Theme, Source>

The affected interpretation is again manifested in the *of/with* variants of the *clear/empty* verbs. Again, we might analyse *clear* (in (63b)) as a change of state verb, in which the DO entity is seen as the affected element, perhaps as in (65). With these verbs the affected entity is the former Source, while the entity that moves is a displaced Theme or Locatum.

(65)   clear: Agent <Patient/Theme, Locatum>

The θ-role lists of the two subclasses (i.e. (62) and (65)) are no longer distinct on the *with/of* variant. Yet, the *Patient/Theme* in the role list is also, alternatively, interpreted as a Goal with a verb like *load*, but as a Source with a verb like *clear*. "This very obvious difference is no longer reflected in the lexical-semantic representation, a serious drawback, since lexical-semantic representations are supposed to capture precisely such differences in interpretation." (Rappaport and Levin, 1988: 23).

To put it briefly, an analysis which makes use of a single θ-role list gives a simple account of the near-paraphrase relation, but fails to give appropriate information for linking and fails to account for the affected direct object interpretation. An account based on two θ-role lists gives information regarding subject/object selection and accounts for the affected interpretation of the direct object (cf. the Patient role), but is unable to capture the paraphrase relation. Thus each of the analyses handles separate facets of the alternation. This can be taken as a reflection of the fact that θ-role *lists abstract away from the meaning of a verb in such a way that they provide only a partial meaning representation.* What is necessary is a more complex representation of the verb's meaning that will permit an analysis capturing at the same time the similarity and the difference in the locative alternation. The suggestion is to draw on lexical

conceptual structures (definitions of meanings) which offer a more complete representation of predicate meanings, and which are anyway required as a part of the (mental and) linguistic lexicon.

6.3. In our first discussion of the lexicon, it was proposed that a complex symbol was a set of features : syntactic features (categorial and subcategorial) and semantic features (including selectional restrictions). The meaning of a lexical concept was viewed as a set of features jointly true of any object falling under that concept (e.g. *bachelor(x)* = 'unmarried (x) and male (x)'), i.e., a bachelor is somebody who is male and unmarried). Progress in lexical semantics has documented the existence of a variety of models of conceptual organization, relevant in defining the meaning of lexical items, i.e., relevant in the elaboration of lexical conceptual structures (LCS), only one of which is the classical 'set of features' model (cf. Lakoff (1987)).

In the case of verbs, the features are themselves (more) elementary predicates (i.e. sentential components), linked by various relations. The meaning of a verb is decomposed into more elementary predicates. Some of these (like BECOME, CAUSE, BE, GO) occur over a broad spectrum of the vocabulary, defining classes of semantically related verbs. The argument places of these predicative constituents are held by variables. (Variables are place holders for NPs). Here are a few examples:

(66)   a. put   [[x does something] cause [y come [to be at z]]]
                   (x does something which causes y to come to be at z)
        b. kill   [x does something] cause [y come[to be not alive]]

The variables in LCSs are ultimately mapped onto positions in syntax. The relation between LCS and syntax is mediated by role-structures which need not contain θ-role labels, but only *indications of relative prominence* between variables. The argument structure of the LCS indicates a verb's adicity, with one variable corresponding to each argument. Notions like Agent, Theme, Location etc. are not primitives, but are definable in terms of *positions within LCSs*. The θ-role "abbreviates" a certain conceptual configuration. "Theme" is the role defined by (66a) (entity that comes to be at a LOCATION), or by (66b) (entity that comes to be in a STATE). Similarly, the subject of the verb DO in (66a,b) is either an Agent or an Instrument and further specification as to [+ Human] will distinguish between these two roles. In other words, θ-roles are *defined* notions: they may be convenient mnemonics or descriptive labels, but have not theoretical status. We may, and will, continue to refer to variables in LCSs by θ-roles labels, but the labels are to be understood as means of referring to variables in particular LCS substructures.

6.3. Let us see how an approach in terms of predicate decomposition deals with the locative alternation of the *spray/load* class of verbs. We continue to accept that *spray/load* have two semantic representations. The first meaning of *spray* (the locative variant) is an instance of a change of location. A simplified LCS is (67).

(67)   load   [x does...[cause [y to come to be at z]]]
                     (x does something which causes y to come to be at z)

The verb in the *with* variant is semantically more complex; it is likely to have a meaning component that the locative variant lacks. As evidence, note that while both variants in (68) entail (69a), only the *with* variant in (68b) entails (69b).

(68)   a. Henry loaded hay onto the waggon.
         b. Henry loaded the waggon with hay.

(69)   a. Hay was loaded on the waggon.
         b. The waggon was loaded with hay.

This entailment suggests that the verb in the *with* variant, but not in the locative variant, denotes the bringing about of a change in the state of the Goal argument. This meaning component produces the affected interpretation of the Goal argument, which is now also viewed as Patient. At the same time the representation of the *with*-variant must capture the near-paraphrase relation between the two variants. Characterizing more precisely the paraphrase relation, we may say that the *with* variant entails the locative-variant, but not vice versa. The locative variant is included in the *with*-variant as a meaning subcomponent. Drawing together these observations, the following LCS (=70b) might represent the meaning of the *with* variant:

(70)   a. load [[x does something (LOAD)] cause [y to come [to be at z]]]
         b. load [[[x does something (LOAD)] cause [z to come [to in a
         STATE]]]BY MEANS OF [x does smth [y to come [to be at z]]]

The representation in (70a) indicates that *load* names an event which involves a change of location. The representation in (70b) indicates that *load* names an event in which a change of state is brought about by means of a change of location (the *with* variant). Thus the LCS in (70b) subsumes the one in (70a), which is embedded in a MEANS clause; this explains the paraphrase relation. The feature LOAD in (70) is intended to indicate the specific manner in which the activity of loading takes place. The presence of this component sets *load* apart from *spray/cram/stuff*, etc. The presence of this component of meaning differentiates between the locative alternation verbs and the verbs of pure change of state like *break*, or verbs of pure change of location like *put*. Let us see how degrees of prominence and the θ-grid can be determined on the basis of the lexical conceptual structure. In (70a), prominence relation are directly "read off" the LCS, (71).

(71)   x < y, loc z >

For (70b) we may assume a general convention, saying that the *main clause of the decomposition determines the basic class membership of the verb* and determines

the linking of the variables. Therefore, the variables in the *main clause* of the LCS are *more prominent* than those in the subordinate clause (cf.Rappaport & Levin, 1988). Given this assumption, the verb in the *with* variant is basically a change-of-state verb, and the variables x, z in the main clause are more prominent than y, which occurs only in the subordinate, means clause; it follows that the z variable in (70b), which corresponds to the argument denoting the entity suffering the change of state, is the one which will be associated with the direct argument variable, in a theta-grid like (72):

(72) $x < z$, with $y >$

The role structure is thus deduced in a principled way, from the lexical conceptual structure of the predicate.

6.5. A last detail in this analysis is to what extent the use of *with* is justified at all by the semantics of English. Before we answer this question, notice that the variable y introduced by *with* is a Theme in the means clause, a Theme in a change of location predication, moreover, it is a Theme which is not sufficiently prominent to become the direct argument, as already explained. Rappaport and Levin (1988) call it a "displaced" Theme and notice the systematic occurrence of *with* with the "displaced" Themes of other verb classes, such as verbs of inscribing, verbs of presenting and verbs of forceful contact, all of which occur in alternating structures.

(73)   a. The jeweler inscribed a motto on the ring.
        b. The jeweler inscribed the ring with a motto.

(74)   a. The judge presented a prize to the winner.
        b. The judge presented the winner with a prize.

(75)   a. Kevin hit the stick against the wall.
        b. Kevin hit the wall with the stick.

The preposition *with* is generally associated with the Instrument role.

(76)   He broke the window with a hammer.

In general, instruments are entities manipulated by an agent in order to bring about an action. For instance, in (76), the instrument is the Theme of the agent's action (a change of location), which brings about the change of state that the verb *break* denotes. Thus, *with* is used with Themes in *change of location* predications, and these Themes can also function as Instruments or displaced Themes. Notice that Themes in change-of-state predications (Patients) cannot take *with*.

(77)   a. I broke the stick against the table.
        b. *I broke the table with the stick.
        (ungrammatical on a reading where the stick breaks)

(78)   a. I hit the stick against the wall.
        b. I hit the wall with the stick.

With *break* (in 77), the Theme undergoes both a change of location and a change of state, hence *with* is not usable. In (78a,b), despite its different grammatical functions, the NP *the stick* is interpreted merely as an entity that changes location, but remains in the same state (despite its different grammatical functions). *With* may accompany the NP *the stick* , which is a displaced Theme.

7. Conclusions.

1. The concept of thematic role may be understood with respect to two distinct lexical representations, the lexical conceptual structure of a predicate and the θ-grid or argument structure of a predicate.

2. Thematic roles are not primitives of semantic theory. They are inferred from (or defined on) lexical conceptual representations. They represent recurrent conceptual configurations in the conceptual representation of predicates.

3. From the point of view of the θ-grid, what counts are the relations of prominence that identify the external argument (D-structure subject) and the direct argument (direct object). Prominece relations are determined by the LCS.

4. The θ-grid, like the LCS, is an element of the lexicon. Since θ-role labels themselves are not included in θ-grids, it is quite clear that they are syntactic objects, which are however linked to variables in LCSs. We may think of the LCs as the *lexical* part of a word meaning and the θ-grid as (an aspect of) the *structural* part of a word's meaning.

5. θ-grids mediate between LCS and syntax, either by being linked to subcategorization frames or by being directly projected onto D-Structure syntax.

Chapter 7

THEMATIC RELATIONS IN SYNTAX

1.Role tiers. The thematic hierarchy.

In the previous chapter, we have established that the lexical entries of predicates also include θ-grids or *argument structures* (= a-structures, cf. Grimshaw (1990) a.o.), which are abstracted away from the predicates' meaning, i.e., their LCSs. Secondly, we emphasized that θ-grids are more than sets of role labels; they are structured in terms of relative degrees of prominence of the arguments. The degrees of prominence signal syntactic behaviour, namely the way in which the respective role is assigned: *direct assignment* by the verb in the case of the direct argument, assignment by a preposition (or case inflection), possibly in conjunction with the verb, in the case of the indirect arguments, *compositional assignment* by the VP in the case of the external argument (the D-Structure subject). The information contained in θ-grids, possibly mapped onto subcategorization frames, is essential for the projection of D-Structures.

In this chapter, we first present an interesting elaboration of the notion a-structure, due to Grimshaw (1990), which has, apparently, gained acceptance among researchers. Secondly, we turn to the principles of the θ-theory module of UG, examining the projection of D-structures from a-structures. Thirdly, we discuss the interface of θ-theory with other modules and subtheories of UG, such as Move α, government theory, etc.

1.1. Grimshaw's proposal. Grimshaw shares the opinion that the a-structure of a predicate is derivable from key characteristics of its meaning; she also shares in the belief that the θ-grid is a structured representation which indicates prominence relations among arguments and that essential aspects in the syntax of a predicate derive from its a-structure.

The novelty of her approach is to propose that prominence relations are established along *two* conceptual dimensions represented in a predicate's LCS: the *thematic hierarchy*, and the *aspectual properties* of the predicate. Due to the inter-relation of the two conceptual domains, prominence relations (along one line) do not directly signal means of syntactic coding (e.g. the notions D-Structure subject and external argument no longer coincide). The model gains descriptive and explanatory power, and the idea that the aspectual properties of a verb influence its syntax is valuable and likely to be correct.

The Thematic Dimension. Taking into account how "active" different θ-roles are in syntactic and semantic processes, linguists have set up a thematic hierarchy

(cf. Jackendoff (1972), Nishiguachi (1984), a.o.). Grimshaw adopts the version of the hierarchy given in (1), and she proposes that the thematic hierarchy is an organizing principle for a-structures, since it reflects the semantic properties of the roles. Remember that each role abbreviates a *cluster of entailments* endorsed by the meaning of some class of predicates.

(1)   Thematic Hierarchy
        (Agent (Experiencer (Goal/Source/Location (Theme))))

There is little doubt that the Agent is the most prominent role (more arguments will be provided in this chapter). The central roles in the hierarchy all have to do with the idea of location, the Experiencer included: the Experiencer is a "personal location", the locus of a psychological process. The relatedness of the Experiencer and the Goal is obvious in English, where they share the preposition *to* (*He was kind to me* (Exp), *He gave all this possessions to the poor* (Goal), or in Romanian where they share the Dative case (*Imi plac dulciurile* (Experiencer), *Și-a vândut sufletul diavolului* (Goal); in fact, they are sufficiently alike to be regarded as specializations of the same prototypical role. The higher position of the Experiencer in the hierarchy is due to its always being [+Personal], unlike the other locative roles. We will accept that the Theme is less prominent than the three locative roles (Goal/Source/Location), although this may be debatable. In the unmarked case, thematic prominence coincides with syntactic prominence; for example, for a verb like *murder*, the thematic prominence relations are those given in (2a); as expected, the most prominent role (Agent) corresponds to the highest grammatical function (Subject in (2b)).

(2)   a. murder(x (y))
           Agent Theme
        b. They murdered innocent people.

But this is not always the case. Consider some verbs that have the a-structure in (3), where Experiencer is higher than Theme, according to the thematic hierarchy. We would expect the Experiencer to be projected as subject and the Theme as some kind of object. There are verbs that confirm this expectation such as *fear, love, hate*, etc. (see (4)), but there are also quite a few verbs that disconfirm the prediction, such as *frighten, surprise, amaze*; these verbs promote the Theme as subject, as seen in the examples in (5):

(3)   (x   (y))
        Experiencer Theme
(4)   They fear the gods.
        They love daffodils.
(5)   Thunder frightens them.
        This country amazes everybody.

This shows that more than the thematic hierarchy is at stake in deciding syntactic relations; there is, presumably, some other principle that supplements the

hierarchy. In Grimshaw's view, this other factor is prominence in the *aspectual hierarchy* .

One important claim stated with respect to the thematic hierarchy is that arguments are θ-marked (and therefore projected) in an order which is the reverse of the hierarchy, that is they are θ-marked *from the least prominent to the most prominent*. The intuition behind this is that the least prominent roles are the most dependent on the verb for their interpretation, and this is why they are marked before the more independent roles. Indeed, Theme is differently understood with different verbs (e.g. Patient /Theme / Precept. etc.,*as* seen in the previous chapter).

One kind of evidence for this claim, and at the same time in favour of the hierarchy, comes from verb-based compounds like *horse-riding, book-binding, God-loving*. The non-head constituent (= the noun) satisfies an argument position in the a-structure of the head (the *ing* V). The θ-grid of the verb is organized according to the thematic hierarchy. In a verb-based compound, one argument is realized inside the compound, and the others, outside of it. It is naturally assumed that the elements inside a compound are θ-marked prior to elements outside the compound; these elements are expected to be lower in the hierarchy than the arguments realized outside the compound. This expectation is confirmed. Consider the verb *give* with its a-structure (6); according to what we have said, the argument corresponding to Theme must be θ-marked first, followed by Goal and then, by Agent. We expect the Theme (rather than Goal) to appear inside *give*-based compounds; this is indeed the case, as shown in (7).

(6)   give $(x(y(z)))$
         Agent Goal Theme

(7)   a. gift-giving to children
         b.*child-giving of gift

The same reasoning explains a rather unexpected asymmetry between psychological verbs of the *fear* class and those of the *frighten* class. Generalizing from the example of *give*, discussed above, for both types of verbs, the syntactic Direct Object of the verb should appear inside the compound.

(8)   a. Man fears god.
         b. a god-fearing man
(9)   a. Teenagers love fun.
         b. a fun-loving teenager

(10)   a. God frightens man.
         b.*a man-frightening god

(11)   a. This exploit appalls parents.
         b.*a parent-appalling exploit

(12) <u>fear, frighten</u> (x   (y))
       Experiencer Theme

Just as in the case of *give*, the least prominent argument in the a-structure, in our example, the Theme, must be satisfied first, while the highest, the Experiencer, must be satisfied last. An example like *god-fearing* is consistent with this, since it is the Theme of *fearing* that is satisfied inside the compound and the Experiencer that is satisfied externally. In *man-frightening*, on the other hand, *man* inside the compound corresponds to the Experiencer while the Theme is satisfied outside. Hence the arrangement of arguments is inconsistent with the principle that θ-marking must observe the organization of the θ-grid, and therefore, the thematic hierarchy. It is the a-structure, not the D-Structure function which determines the well-formedness of compounds.

1.2. The aspectual dimension. In this section, the aspectual classification of verbs will be briefly reviewed, only in so far as it is relevant for a-structures. We are merely interested in the aspectual decomposition of predicates (Dowty (1979)), that is, in highlighting those more elementary component predicates that characterize the various aspectual classes. Since aspect deals with the temporal contour of events, the aspectual classification should in the end say something about the temporal structure of event-types, which is responsible for their particular entailments and for the distribution of the aspectual markers and of the temporal adverbials with event types. The hypothesis of lexical decomposition is that these entailments are in fact endorsed by the meaning of these elementary components (e.g. BECOME, DO, etc.), whose satisfaction conditions demand a certain temporal structure of the described event.

Familiarity with the Vendler-Dowty and Mourelatos aspectual classification is presupposed. Reference will be made to the following event categories: states *(know, believe, please, fear, be tall/green, concern*, etc.); activities (processes) (*work, run, rumble, roll, smoke, eat, play, swim, drive, seek*), events which are either instantaneous *events* (approximately, Vendler's achievements: *melt, darken, find, collapse, explode, forget, notice, realize, begin, become, touch, reach, arrive at*) or protracted/durative events (Vendler's accomplishments *make, build a house , draw a picture, dig a hole, kill, paint a landscape*, etc.). These verb-types differ in their conceptual complexity, describable in terms of semantic components in the LCS.

Dowty hypothesizes that the simplest conceptually are states, which are contained in the semantic make-up of achievements and accomplishments.

States are temporally *unbounded* and qualitatively *homogeneous*. Since they are homogeneous, if V is a state, then V(x) is true at all subintervals of time I, including all moments of time. To detemine the truth-value of a state predication one does not need to consider more than a moment of time (Think of sentences like *Bill is tall. He knows English.*).

States may be judged as to truth at any moment of time, because they are not dependent on time. Bach (1981) notices that states have an *abstract atemporal quality*. In contrast, in the case of events and activities, we are naturally led to think about their temporal structure and also about their temporal and spatial coordinates. Compare the naturalness of questions like: "Where and when did this event take place?" "Where is this process going on?" against the oddity of "When and where is he tall?" or "Where does he know algebra?".

Because of their unbounded and abstract quality, states are hard to individuate, they are uncountable; cardinal quantifiers, for example, do not occur in the context of state predications (*He loves opera twice*), unless reference is made to occasions when the state was manifest (*John hated liars three times in his life.*).

Thematically, states are compatible with Themes (as we saw in the discussion location), Experiencers (e.g. the subjects of *love, hate,* etc.) and other locative roles (*The kichen* (Location) *reeks of tobacco* (Theme)), but not with Agent/Instruments, because states are not controllable (hence their non-occurrence in imperatives (*Know Russian!*), or with agentive adverbs (*John willingly/deliberately knows the answer.*)).

Since they are unbounded, states do not occur in the progressive aspect, which in English shows *limited* duration around a point of reference (*John is liking daffodils.*).

Activities or processes. The most salient temporal properties of processes are the following two in (13); the first expresses the similarity of activities and events, as 'non-stative' event types; the second expresses a property that activities share with states, but not with events.

(13) a. If V is an event or an activity (process), then V(x) is only true of an interval longer than a moment.
      b. If V is a process, then if V(x) is true at some time interval I, then V(x) is true for all subintervals of I which are longer than a moment.

The first property is true of all non-stative verbs and it explains their compatibility with the progressive (which also shows duration round a limited interval: *Where do you live?* vs *Where are you living?*). To understand the need to evaluate activities over intervals not moments of time, consider verbs like: *run, roll, swim* in sentences like (14):

(14) The ball rolled down the hill.
      He swam in the lake for more than an hour.

Imagine a segment of a motion picture film showing a ball rolling down an inclined plane. As stressed by Dowty(1979), a single frame of this film does not in itself offer evidence for saying that the ball is really in motion, but any two frames will show the ball in different locations, providing evidence of movement. The truth conditions for verbs of motion, or for any other predicates denoting a change in (physical) properties over time, would require access to information about the physical state of the

world at least at two moments of time. This explains (13a). Like states, processes are qualitatively homogeneous; they can be prolonged indefinitely (cf. *He walked on and on* vs **He broke the chair on and on*). Activities characteristically occur with *for*-time adjunct, which measure their duration (cf. *He walked for three hours*). Property (13b) express the homogeneity of activities: if it is true that he walked for three hours, then at any subinterval of time longer than a moment that he walked.

The most general activity verb seems to be DO; activities are "doings". So DO might be viewed as a common component in the structure of activity predicates. In fact, as shown by Ross (1972), DO more generally separates *non-stative* verbs (events and activities) from stative verbs. Ross (1972) presents a variety of contexts where DO occurs with non-statives, but not with states. Here are his examples:

(15)a. You've bungled a lot of hands John, but fortunately Jacoby has done so/it, too.
a'. *You've known a lot of answers George, and Harvey has done so, too.
b. What I did then was sleep for two hours.
b'. *What I did then was be in Boston.
c. Solving English crossword puzzles is impossible to do.
c'. *Consisting of five members is impossible for the Committee to do .
d. Waxing the floor, I have always hated to do.
d'. *Knowing how to type, I've always hated to do.
e. That Bob resigned, which I think I also should do, was a good idea.
e'. *That John believes me, which everyone should do, is obvious.

The fact that events and activities are both doings is not surprising, since, among other things, activities may be subparts of events. Thus, in the examples above, DO may substitute any non-stative predication.

Ross also suggested that the typical subject of DO is the Agent: "Fillmore's notion of Agnet might be replaced by the notion "possible subject of DO". Generalizing from Ross's suggestion, we may say that the Subject of DO should be any role that may be viewed as a causal factor (e.g. Agent, Instrument, Source, Cause).

Events. An event takes place at a time if one state (the initial state) is replaced at that time by a second state (the final state). According to von Wright (1963: 28): "The event itself is the change or transition from the state of affairs which obtains on the earlier occasion to the state which obtains on the later occasion. The event of 'opening the window', for instance, consists of a change from a state when the window is closed to a state when the window is open. Any event can be defined as a change of state, where the two states are of a particular form - one state is the negation of the other. An event is, therefore, a change from a state p to a state q, where p is non-q.

Notice that events like processes have to be evaluated over at least two moments of time, i.e. over an interval.

Whether they are punctual or durative occurrences, events take (some definite) time to be realized. Both achievements and accomplishments occur with *'in - X much time'* phrases and also in the frame: It took him X - much time to - (although the intrpretation is admittedly different for the two subcategories of events).

(16)   a. He painted the picture in an hour.
          b. He noticed the picture in an hour.
          c. It took him two years to write the novel.
          d. It took him two hours to notice the new curtains.

Events are *heterogeneous* qualitatively. They always involve some product, upshot or outcome (*find a treasure, build a house, walk a mile*), so that it is pragmatically clear when they have ended. Therefore, events have boundaries and can be individuated, i.e. counted using quantifiers or frequency adverbials (*He often walks a mile in the evening*). From what we have said so far about the internal structure of events, the following important property that distinguishes them from processes follows:

(17) If V is an event verb, then if V(x) is true at some interval I, then V(x) is false at all subintervals of I.

And this property is true both of punctual occurrences (*finding a penny*) and of protracted events (*building a house*).
Since events are true of particular time intervals, they have definite space time coordinates identified by place/time adverbials, which show that events took place at time points (*yesterday, at noon*, etc.) or within time periods (*He came here last year*).
For many events (e.g. *building a house, reading a play, walking a mile, solving a problem*) the change of state may be prepared by some activity, while other predicates focus only on the change of state, backgrounding or simply leaving out the causing activity and the causing factor (e.g. *John died. John died (from his wounds) (in the end)*). The latter are 'becomings', and they are conceptualized as instantaneous events (achievements). The interval considered includes the moment when the negation of p is still false and the moment when p is true; achievements are truly changes of state. Of course, one may say *John is dying* (but is not dead yet) and then we are describing an activity (process) *preceding* the change of state. There are also predications which conceptualize the complete causal structure of the event, expressing the causal factor as an obligatory argument and (at least implicitly) including the causing activity: e.g. *Those wounds killed John in the end. It took him three years to complete the painting. He wiped the floor clean.* ('He caused the table to be clean by wiping it'). Complete protracted events have causal structure (i.e. 'cause' is an argument).
There is a class of 'lucky achievements' (*finding a penny , realizing something*) which do not require any preparatory activity; these resist use in the pregressive *He is realizing the truth.*

Since we said that achievements are simply changes of state or becomings, we hypothesize with Dowty (1979) that they have in their LCS the predicate BECOME (*become, come to be* a.o.) which is a sentence operator (i.e. it is followed by a complement clause). In (18) there are a few examples that factor out the intransitive verb and the resulting state.

(18)   realize - 'come to know something which one did not know earlier'
forget - 'come not to know what one knew earlier'
find/discover - 'come to know the location of'
lose - 'come not to know the location of'
arrive at/reach - 'come to be at a place'
depart from/leave - 'come not to be at a place'

The analysis of change-of-state events like *The window opened* may be (19), where the inchoative verb is followed by the resulting state.

(19)   The window opened.   BECOME (the window is open)

This analysis shows that 'becomings' are more complex than states, incorporating them. The truth conditions for BECOME make explicit the passage from the negation of the resulting state to its truth.

(20) BECOME (p) is true at t, if p is true at t, and false at $t_{.1}$

Morphosyntactic evidence for an analysis of achievements in terms of BECOME + a stative clause primarily comes from the existence of regular word formation rules for deriving achievements verbs from adjectives. BECOME is realized as a (possibly null) verbal suffix: *hardEN* (BECOME (hard)), *solidIFY* (BECOME (solid)), *cool* (BECOME (cool(er))).

Accomplishments or protracted events have a more complex structure, since they conceptualize not only the change, but also its causing factor, the activity (process) that resulted in the change. Following a long tradition, we will assume that accomplishments contain the predicate CAUSE in their LCS. CAUSE is a bisentential operator, its subject clause expresses the causing activity, with a causing agent, and the object clause expresses the resulting state.

(21)   John painted a picture.
((John paints) CAUSE (BECOME (a picture exists)))
John cooled the room.
((John does something) CAUSE (BECOME (the room is cool)))

The most obvious motivation for the bisentential nature of CAUSE is semantic. As Ryle (1949) observed, durative events are 'bipartite' in a way that

activities and achievements are not. In applying an accomplishment verb, "We are asserting that some state of affairs obtains over and above that which consists in the performance, if any, of the subservient task activity. For a runner to win, not only must he run (task activity), but also his rivals must be at the tape later than he (result), for a doctor to effect a cure, his patient must both be treated (task activity) and be well again (resultative state)".

Vendler (1967: 154) makes essentially the same observation, in pointing out that accomplishments, when occurring without a sentential subject and without a *by*-phrase, are felt to be elliptical in some sense. From a sentence like (22a), one may infer (22b), where (22c) approximates the semantic structure of (22a).

(22)   a. John dissolved the Alka Seltzer.
        b. John dissolved the Alka Seltzer by doing something.
        c. John's doing something caused the Alka Seltzer to dissolve.

Support for the bisentential analysis of CAUSE comes from constructions in which the causing activity is lexicalized and variable, and a separate component expresses its resulting state. Factitive constructions are of this kind.

(23)   a. They shot him dead.
        b. She threw the door open.
        c. He smoked himself into oblivion.
        d. He swept the floor clean
        (His sweeping the floor caused the floor to become clean)

A second class of accomplishments which have separate constituents for the causing activity and the resulting state is the familiar verb + particle construction, involving change of location. Within the lexical restrictions of English, it is often possible to hold the result constant, and vary the activity as in (24b):

(24)   a.   throw NP away
                throw NP down
                throw NP aside
                throw NP in
                throw NP up
        b.   put NP away
                throw NP away
                send NP away
                drive NP away
                call NP away

Moreover, many monomorphic accomplishments specify some associated activity which produces the change (*electrocute, drown, strangle, hang, poison* ('use poison to cause somebody to become dead')), as compared to the less specific *kill*.

Similarly, in the class of 'drawing' verbs, one can not only make a picture, but also *paint, draw, sketch, stencil or copy* one. Generally, we may assume that in LCSs

the subject clause of CAUSE in the semantic representation of a general causative like *make, kill, cause* contains a quite general activity or event verb (e.g. DO), while other accomplishments have a more specific predicate in this place.

We may conclude that the bisentential analysis of CAUSE is motivated, and that the analysis of accomplishments in terms of CAUSE is also justified.

2. Role Tiers. The aspectual hierarchy.

We have established that a *prototypical event* has a complex stucture composed of two subevents (the arguments of CAUSE as in (19)). This conceptual Gestalt has a decissive role in defining the aspectual hierarchy of roles. Grimshaw (1990: 27) proposes that the aspectual hierarchy of roles is directly determined by this configuration, rather than being projected from the LCS of individual predicates. This amounts to saying that arguments in the first subevent (the subject of CAUSE in our description) are *intrinsically* more prominent than those in the second subevent.

(25)

activity ——— e ——— change of state
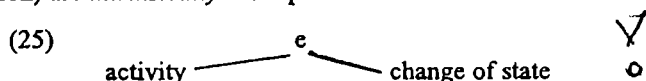
The protypical event determines prominence, "assigning the maximally prominent position in the aspectual domanin only to an argument participating in the first subevent, regardless of the actual lexical semantic representation of the predicate" (Grimshaw 1990: 40). The first subevent is that of the causing activity, therefore, it includes causally relevant participants; we will use the generic name *Cause* for all these causally relevant roles (such as an Agent, an Instrument a.o.). *Cause* is the most prominent role in the aspectual hierarchy, and it is simply opposed to (the) other (affected) roles. At the same time, participants in the second subevent (typically) Themes will *never* be prominent in the aspectual dimension (even when they are the sole participants in the whole event structure). A-structures are in the end determined by the two hierarchies of roles, the thematic hierarchy and the aspectual hierarchy.

(26)   (Agent (Experiencer (Goal/Source/Location (Theme))))
        (Cause (other) ...)))

The lexical semantic representation of a predicate projects the set of these grammatical arguments with a specification of their thematic and causal status. Each of the two hierarchies imposes its own set of prominence relations on this collection of arguments as illustrated in (27) for *break* (*The boy broke the window*).

	(x	(y)
(27) break	Agent	Theme/Patient
.	Cause..	

This view of θ-grids allows a different definition of the notion "external argument": *an argument is external only if it has maximum prominence on both dimensions.* An argument which is not external is internal.

This view no longer equates 'external argument' with 'D-Structure subject'. Consider again the psychological causative verbs in the *frighten, scare, amaze,* etc.class:

(28)   a.   The prices frightened the tourists.

          b.   frighten (x   (y))

                     Experiencer   Theme

                     Cause

For the *frighten* verbs, the first position in the themetic hierarchy does not correspond to the first position in the cause dimension, since they are not occupied by the same semantic argument. The second element in the thematic hierarchy (Theme = *the prices*) is the most prominent role in the causal hierarchy (Cause = *the prices*). Hence, we will say that the verb *frighten* has no external argument, although it has a D-Structure subject.

Certain grammatical processes are defined on *argument-structure*; they are lexical operations (i.e.they operate prior to syntactic projection) and they express regularities in terms of notions like external/internal argument. Other grammatical processes, e.g. the use of the clitic *ne* in Italian, take into account structural notions like D-Structure subject, D-object, S-structures subject (i.e. the position that gets Nominative case in a tensed clause).

3. Relevance of a-structures.

As examples of processes defined on a-structures, we mention argument-realization in compounds and the passive.

3.1. Argument-linking in verbal compounds once more. As already hinted at above, verb-based compound adjectives combine with nouns in the usual manner of predicates, the nouns inside and outside the compound satisfy argument positions in the initial verb's θ-grid. This is obvious if we examine a sentence like *Tigers eat men* and a nominal phrase like *man-eating tiger*: one argument of the verb is realized inside the compound and one will be the noun which the verb-based adjective modifies. Which argument is realized inside the compound is determined by the verb's a-structure.

The general principle is that when the head takes more than one *internal argument*, the *least prominent* argument must be inside the compound (since it is θ-marked first) and the more prominent outside. The examples below, like those in (7)-(9) above, confirm the correctness of this principle.

(29)   a.   They arrange flowers in vases.

                flower-arranging in vases

                *vase-arranging of flowers

          b.   They bake cookies for children.

                cookie-baking for children

                *child-baking of cookies

An additional prediction is that compounding of an external argument will be impossible, whenever the predicate takes an internal argument in addition to the external one.

(30) a. Novices arrange flowers.
          flower-arranging by novices
          *novice-arranging of flowers
      b. Students read books.
          book-reading by students
          *student-reading of books

The external argument is always the most prominent argument in the a-structure, therefore it must always be the last, to be satisfied outside the compound. Notice now that if there is only one argument in a θ-grid, that position cannot be realized *inside* an *adjectival* compound based on the verb. If this were so, the adjectival compound would be saturated and will have no argument position available for combination with the noun it modifies. And this is the case irrespective of whether the unique argument is external (e.g. the Agent subject of an activity verb like *shout, play*) or internal (e.g. the Theme argument of an unaccusative verb like *fall*).

(31) Men shout [NP -]
      shouting (x): shouting men/crowd
      *man-shouting ( )   **man shouting event

(32) Leaves fall [- NP]
      falling (x): falling-leaves
      '*leaf-falling ( )

To end this discussion, consider the psychological causatives of the *frighten, amaze,* etc. class again. Notice that no good compound can be formed from a simple transitive sentence like (33):

(33) a. The storm frightened the child.
          Theme   Experiencer
          Cause   other
      b. *a child-frightening storm
      c. *a storm-frightening child

Each compound goes against the ranking imposed by one of the two hierarchies. If one follows the Thematic hierarchy, then Theme (= *the storm*), which ranks lower than Experiencer should be inside the compound, as in (33c), but this would violate the aspectual dimension, where *the storm* is Cause; if one follows the aspectual hierarchy, then *the child*, which is non-causal and thus less prominent, should be inside the compound, as in (33b), but this would violate the Thematic hierarchy, according to which the Experiencer (*the child*) should be outside of the compound because it is more prominent than the Theme.

3.2. The Passive as an operation on a-structures. In early generative studies, the passive was viewed as a complex syntactic operation mainly defined on transitive structures. More recent research has suggested that a more explanatory hypothesis is

that passive verb(s) (forms) are produced by means of a lexical operation on a-structures, and then the passive verb form is directly projected into syntactic structures . The lexical operation that produces passive verbs is the suppression of the external argument (cf. Hoeckstra (1984), Grimshaw (1990)). Roughly, it is an operation that suppresses the argumenthood of the subject/external role. The role of the subject (or the external argument) will be expressible as an adjunct (the *by* phrase).

(34) The book was carefully examined (by the students).

This view of passive makes two predictions. First, there may be transitive verbs which do not passivize because they lack an external argument (the psychological causatives in English and other languages provide an example, since they are transitive, but do not have *verbal* passives (see next paragraph).The second prediction is that intransitive verbs can be compatible with the passive, if they have external arguments.

In the discussion of subcategorization, we have argued for the existence of two subtypes of intransitives: unergatives [NP ---] and unaccusatives [--- NP]. The relevant issue for the passive is whether the unique argument of these verbs can be an external argument. The answer is negative for unaccusatives. The unique argument of unaccusatives is normally a Theme, and unaccusatives typically designate states (*be, remain,lie*, etc.) or changes of state (*melt, collapse, sink, touch*, etc.). Given the position of states and change of states in the prototypical event template, Themes are participants in the second subevent, and therefore Themes are *intrinsically unable* to count as maximally prominent on the aspectual dimension. This is why an *unaccusative verb will have no external argument*. In agreement with the syntactic properties of their unique argument, this NP is projected as an underlying DO, in the frame [--NP].

Matters are different for unergatives, most of which designate activities (*work, cry, breathe, sleep*, etc.). Activities constitute the first subevent of the prototypical event structure in (25); arguments of activities may be causes, they may be maximally prominent on the aspectual dimension. When the respective arguments are also prominent in the Thematic hierarchy, the unergative (activity) verb will have an *external* argument. Since, unergatives (*may*) have external arguments and we expect them to be, in principle, passivizable, a possibility which is realized in languages like Dutch or German. So among intransitives, the unergatives may, and the unaccusatives may not, passivize because the former do, and the latter do not, have external arguments. We resume examples from Dutch, due to Hoeckstra (1984).

(35) a. Er wed de hele avond door een van de kinderen gehuild.   (unerg.)
There was the whole evening by one of the children cried.
b. Er werd in dere kamer vaak geslapen.   (unerg.)
There was in this room often slept.
c. ˙Er werd door de kinderen in het weeshuis erg snel gegroeid.   (unacc.)
There was by the children in this orphanage very fast grown.

d. ˙Er wed door het water snel verdampt.
There was by the water fast evaporated.

Notice that, for the same verb, an Agentive use may be felicitous in the passive (because there is an external argument, the Agent, which is a causal role and hence, maximally prominent on both hierarchies), while a non-Agentive use may be infelicitous in the passive, because no external argument is defined. An example is offered by Jackendoff's discussion of the verb *touch,* which may be a (change of) state verb (*The arrow has barely touched the target*) or an accomplishment (*Can you touch the ceiling?*). Consider the following sentences:

(36)   a. The bookcase was being touched.
         b. Somebody was touching the bookcase.
         c. The lamp was touching the bookcase.
         d. *The bookcase was being touched by the lamp.

Sentence (36a) is an acceptable passive sentence; notice that it is understood as unambigously agentive, though no *by* phrase is expressed; (36a) is interpreted as the passive of (36b). The argument structure of (36c) is presumably as in (37), no constituent is aspectually prominent, therefore no external argument is defined; the passive in (36d) is illegitimate since it suppresses the Theme (the *by* phrase), which is an internal argument.

(37)   touch   (x   (y)
                 Location Theme

Sentence (36d) further supports the idea that it is the relative prominence of the arguments in the θ-grid which counts for the passive; the suppressed argument, which may occur in the *by*-phrase, should be more prominent than the derived subject; (36d) violates this principle, since, as shown in (37), the Theme (*the lamp*) is lower in the Thematic hierarchy than the Location (*the bookcase*).

Thus, the examples have shown the a-structures may be used to state significant linguistic generalizations. Prominence relations in θ-grids are determined by the joint action of the Thematic and the Aspectual role hierarchies. As we said, a-structures are essential in the projection of D-structure. It has been hypothesized that the two thematic dimensions contribute in different ways to the projection of D-structure. The aspectual hierarchy determines the projection of the grammatical functions, so that an argument which is causally prominent is projected as the D-Structure subject. The Thematic dimension is essential for the projection of the obliques.

3.3. In what has been said so far, we have determined the a-structure of several major classes of verbs, as resulting from the interplay of the two dimensions.

First, all the verbs that can have Agents have a role which is most prominent on both hierarchies, therefore, they have an external argument. Since the Agnet will always be an external argument, an important *universal* principle can be derived: Agents are always D-structure subjects, there is no verb configuration in which Agents are objects. There are several verb subcategories that may take Agents as subject (below each we give its a-structure on the thematic dimension).

(38)   a.   Transitive agentive (*break, build*, etc.)
             (x   (y))
             Agent   Theme

           b.   Ditransitive (*give, donate, offer*, etc.)
             (x   (y (z)))
             Agent Goal Theme

           c.   Unergative(*sleep, weep*)
             (x)
             Agent

There is also a class of well-behaved psychological agentive (causative verbs). These are the agentive uses of the psychological causatives in the *frighten* class (*frighten, annoy, impress*), plus those verbs that are always agentive, such as: *tease, kid, entertain, mesmerize*, (e.g. *John tried to impress me (with his flamboyant rhetoric), John did his best to annoy me last night, He is kidding you, You shouldn't be teasing your aunt like this.*) None of the characteristic effects found with the non-agentive Theme - Experiencer verbs are found with always agentive verbs (*kid, entertain*, etc.), or in contexts where agentivity is clearly indicated. In a sentence like *The queen amused the audience*, the subject is ambigous between a Theme interpretation (e.g. *The queen amused the audience when she nearly fell on a banana skin*) and an Agent interpretation (e.g. *The queen amused the audience with her witty speech*). Notice that the always agentive plychological causatives behave like the other agentives, for instance, they form ER-agentive nouns: *entertainer, teaser*, but not °*frightener*, *impresser; they may be the base of adjectival compounds: *The magician mesmerized the audience/ audience-mesmerizing magician* etc. Therefore, we may add the class of Agentive psychological causative to our list of verbs that can be agentive.

(38)   d. Agentive psychological causative (*kid, entertain,tease*)
            (x   (y))
            Agent   Experiencer

We have also mentioned one class of verbs that never have external arguments, because their unique argument is the Theme, which is intrinsically not prominent aspectually.

(38)　　e.Unaccusative (be, remain, melt, etc.)
((x))
(The double brackets indicate that the unique Theme argument is internal.)

3.4. In the remaining of our presentation of thematic structure, we will look at two verb classes with somewhat exceptional status: the first is the class of the (non-agentive) psychological *causatives* i.e. the *frighten* class, also known as "psych-verbs" (cf. Postal (1971) a.o.); the second class is a class psychological *state* verbs in the *fear, dread, like* class.

The psychological *state* verbs have an argument structure of type (Experiencer (Theme)); they are exceptional in that neither of their two roles is a causal factor, so neither role can be maximally prominent on the aspectual dimension. This is the reason why these verbs occur in a variety of lexical patterns. There is first a class of verbs which treat the Experiencer as if it were most prominent not only thematically, but also aspectually. The Experiencer may be treated as *intrinsically* prominent in virtue of its being an always [+Personal] role; languages are surely person-centered, the Experiencer is treated as an external argument; these verbs behave regularly with respect to passivization(39b), compound adjectives formation, etc; such verbs are *fear, like, love, hate, dread*.

(39)　　a. Man fears god.
a god-fearing man
b.This actress has always been loved by the public.
His cruelty has always been dreaded by the people.
c.Teenagers love fun.
fun-loving teenagers
d.Nations hate war.
war-hating nations

A second class of psychological state verbs are more or less structured on the pattern of Location-Theme unaccusatives. Neither of their arguments (Theme, Experiencer(=personal location)) counts as external. The Theme ends up as surface subject; the Experiencer is realized as a Dative, or even as a marked Accusative. It is worth quoting examples from both English and Romanian: E.*matter, concern, regard, please, R plăcea, durea.*

(40) English　　a.This matters to me.
b.The news concerned me.
This regards me.
This weather pleased us.
Romanian　　a.Imi plac filmele.
Imi folosesc exercițiile.
Mi-e foame/frig/rău.

   b.Chestiunea mă priveşte.
   Mă doare capul.

The marked nature of this Accusative shows in the impossibility to passivize these constructions (*I am regarded by the question* / **Sunt privit de aceast\ chestiune*). This Accusative is an instance of lexically marked "quirky case". We can view this as a situation in which the thematically most prominent argument, the Experiencer, is skipped in the aspectual analysis(which is responsible for the 'regular', 'unmarked' realization of the grammatical functions), and does not become the grammatical subject. This allows Theme to become subject.

   At the limit, both arguments remain internal even in S-structure, in languages like Romanian, where the Nominative does not always have to be assigned. Here are a few examples of such 'impersonal constructions'.

   (41)   Imi place de tine.
           Imi vine să râd.
           Imi pasă de tine.
           Imi arde de glume.

   3.4. Finally, let us examine the *causative* psych-verb (the *frighten, alarm* class). First of all, let us make sure that they are causative not stative; one reliable test is the progressive; verbs in the *fear* class do not take the progressive, while those in the *frighten* class do take it.

   (42)   a. The storm was frightening us.
           b. *We were fearing the storm.

   There is also a tendency for the morphology to reflect the causative character of these verbs, as proved by the existence of the *en* forms in (43)(where *en* is a causative affix)

   (43)   The movie enraged the audience.
           The movie frightened the audience.

   In fact, most of these verbs also have agentive uses, which are clearly causative (as shown above). In the non-agentive use, the Theme is therefore a Cause, and is most prominent aspectually. Consequently, with non-agentive psychological causatives, one of the arguments is more prominent thematically (the Experiencer), the other is prominent aspectually (the Theme), with the effect that neither argument counts as an external argument (an external argument should be the most prominent argument on both dimensions).
   Lack of an external argument explains the idiosyncratic behaviour of these verbs within the class of transitives. For instance, these verbs lack *verbal* passivess (as expected, since the passive suppresses an external argument and these verbs do not have external arguments). To make things easier in testing this prediction, we will use psychological causative verbs that (more or less) lack agentive counterparts (the

agentive verbs naturally have verbal passive): *preoccupy, worry, perturb* (cf. Grimshaw (1990)). They do have "stative" passives, which may look like passives (i.e. constructions constituted of the copula *be*+a past participle *adjective* (instead of a verb in the past participle (44b)).

(44)   a. The situation worries/perturbs/preoccupies Fred.
        b. Fred is worried/perturbed/preoccupied by the situation.

There are several arguments that show that the sentences in (44b) are "stative", not verbal, passives. A first thing that comes to mind in showing that the *-ed* forms are *adjectives* not verbs is the possibility of using a variety of prepositions in addition to *by*. The prepositions are lexically selected by the adjectives (*amazed at, worried about, preoccupied with*, etc.). Such variation does not occur with the agentive *by* phrase (45c):

(45)   a. Fred is worried about/by the situation.
        b. Fred is entertained by/*with his host.

Notice that the adjective in the stative passive accepts prefixation by *un*, in forms like *unperturbed, unworried*, though there are no verbs *to unworry, *to unperturb*.

(46) Fred is unworried/unperturbed/preoccupied by the situation.

A second piece of evidence that shows that passives in (44b) are stative, not verbal, passive is that these verbs cannot be used in the *progressive passive*; sentence (47b) behaves like a stative adjectival construction.

(47)   a. The situation was depressing Mary.
        b. *Mary was being depressed by the situation.
        c. *Mary was being depressed about the situation.

With an agentive psychological verb, the paradigm changes in the expected way, and the progressive is fully grammatical with *by*.

(48)   a. The government is terrifying people.
        b. People are being terrified by the government.

The verbal passive in general does not affect the stativity of the predicate. When the input is a state, the output is a state; when the input is an event, the output is an event.

(49)   a.*Many people are believing this hypothesis.
        b. *This hypothesis is being believed by many people.
        c.They are discovering new ways to fight pollution.
        d.New ways to fight pollution are being discovered.

So the change in the *frighten/depress/worry* class cannot be attributed to effects of verbal passivization. If the passives in (44b) were verbal, they should occur in

the progressive. If, on the other hand, these "passives" are adjectival constructions, lack of the progressive is expected. The absence of a verbal passive for psychological (non-agentive) causatives follows from the fact that the Theme subject of the active verb is not an external argument, and therefore not a candidate for suppression. We have also explained the exceptional behaviour of these verbs regarding the formation of adjectival compounds.

On the other hand since these verbs are well-behaved along the aspectual dimension, having a Cause argument (the Theme), the two arguments are projected in a regular transitive configuration. As a consequence processes that are defined on underlying DOs or subjects operate on these verbs as well. An example is middle formation, which operates on underlying internal DOs. Thus we have (50a-b), on the model of (50c).

> (50)   a. This child frightens easily.
>   b. She scares easily.

This ends our discussion of psych-verbs. In these two sections, we have investigated two more verb classes that can be added to the list in (38). (A second set of brackets indicates that both arguments are internal in (38h)).

> (38)   g. Psychological state (<u>fear</u>)
>   (x   (y))
>   Experiencer, Theme
>   h. Psychological (non-agentive) causative (<u>frighten, worry</u>)
>   (x   (y))
>   Experiencer   Theme

The existence of a-structures, alongside of D-Structures, allows a more felxible description, with generalizations defined on various representations.

④ The module of θ-Theory. The domain of θ-Theory is the study of linking and θ-assignment. Linking principles relate information in LCSs and a-structures to syntax, (possibly) through subcategorization frames. The theory of θ-assignment specifies the set of θ-assignig categories and the manner in which the roles are assigned.

It will be clear that roles are in fact assigned to syntactic positions, and (indirectly) to the constituents occupying these positions. A position which is assigned a θ-role is an argument position or A-position. A constituent which occupies an A-position is an argument of the head (an object or the subject).

In the study of X-bar syntax, it was seen that predicates are *unsaturated* elements, which require a certain number of arguments for the well-formedness of a sentence containing them. We have also formulated a projection rule (repeated below)

for the predicate-complement relation, essentially generating complements as sisters to their heads in configurations (51b,c).

(51)　　a. Projection of the Complement Relation.

If a. α is a member of category X°,

b. β is a member of category YP,

c. α takes members YP as complements,

then, if α takes its complements on the right
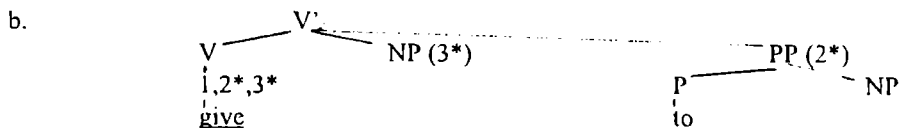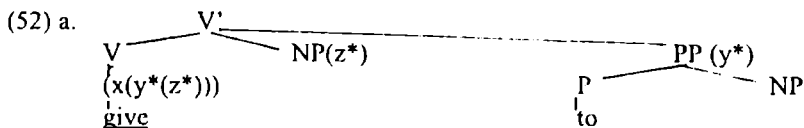
$[\alpha\beta]$ is a member of category X', and

if α takes its complements on the left

$[\beta\alpha]$ is a member of category X'.

b.

$$
\begin{array}{c}
X' \\
X^{\circ} \qquad\qquad YP
\end{array}
$$

c.

$$
\begin{array}{c}
X' \\
YP \qquad\qquad X^{\circ}
\end{array}
$$
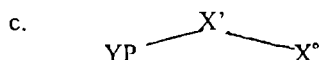
We know now that in addition to licensing these categories (YPs), predicates also θ-mark them; θ-marking is best viewed as a kind of indexing: each argument position gets a role index matching a role in the head's a-structure. Prominence relations dictate the order of θ-marking (from the least prominent to the most prominent external role) and how the roles are syntactically realized (e.g. Cause is realized as the D-structure subject).

As each argument position (i.e. subcategorized position and the subject position) is indexed by a θ-role, that θ-role is *saturated or discharged* from the θ-grid of the head (see (52)). A θ-grid is saturated if all its positions have been discharged; (since Higginbotham (1984), it has become customary to use starred variables (x^*, y^*) or starred numbers $(1^*, 2^*)$ to indicate that a role is discharged; unstarred numbers or variables indicate an undischarged role). In (52) the object roles of *give* have been discharged, but the subject is still unsaturated.

(52) a.

$$
\begin{array}{c}
V' \\
V \qquad NP(z^*) \qquad\qquad\qquad PP\,(y^*) \\
(x(y^*(z^*))) \qquad\qquad\qquad P \qquad\quad NP \\
\underline{give} \qquad\qquad\qquad\qquad\quad to
\end{array}
$$

b.

$$
\begin{array}{c}
V' \\
V \qquad NP\,(3^*) \qquad\qquad\qquad PP\,(2^*) \\
1,2^*,3^* \qquad\qquad\qquad\qquad P \qquad\quad NP \\
\underline{give} \qquad\qquad\qquad\qquad\quad to
\end{array}
$$

An argument (position) which has been indexed by a role is said to be *thematically identified*. As can be seen in (51) and (52), θ-marking takes place under

sisterhood, (to the head or to one of its projections*)* therefore, under *government* by the head (see below).

4.1. A common-sensical principle in relating a-structures and D-structures should be that "the same" a-structure is projected as "the same" D-structure. In other words, sentences which are thematic paraphrases of each other should have the same D-structure. The pairs below are cases in point, and most researchers agree that they have the same D-structure and differ in terms of transformations.

(53)   a.   They offered the lady flowers.
                 offer (Agent(Goal(Theme)))
                 They offered flowers to the lady.
        b.   She baked the children a pie.
                 bake (Agnet (Benefactive(Theme)))
                 She baked a pie for the children.

Rcently, Baker (1988: 46) has labelled this the "hypothesis of the uniformity of theta-assignment" formulating it as in (53).

(54) <u>The Uniformity of θ Assignment Hypothesis</u> (UTAH)
Identical thematic relationships between items are represented by identical structural relationships between these items at the level of D-Structure.

In fact, this principle has been implicitly at work ever since the beginning of case grammar; it is but fair to say that this principle sets standards of explanatory adequacy which are not easy to meet. We have had an example of this in our discussion of the *spray/load* verbs, where failure to assign the same D-structure to pairs of sentences which seem to be thematic paraphrases of each other finally led to the conclusion that those sentences were not true thematic paraphrases (see preceding chapter).

4.2. The most important principle of θ-theory is the so-called θ-*Criterion*, put forth by Chomsky (1981). Informally, it says that each θ-role of an a-structure must be assigned to one and only one syntactic position, and conversely, that each position should bear one and only one θ-role.

The first part simply says that θ-grids must be saturated and that the same role cannot be assigned twice. A sentence such as *What do you like roses?* violates the θ-Criterion because it assigns the Theme role twice, to the interrogative pronoun (*what*) and to the DO (*roses*). The second part says that, on pain of ruining intelligibility, a syntactic position cannot have more than one thematic index.

Thematic indexing takes place at the level of D-structure and is not altered or repeated during a derivation; *this is why the D-structure is said to be a projection of θ-structure*.

Let us state the θ-Criterion (in a formulation due to Speas 1990).

(55) θ-Criterion
a. Every argument position must be θ-marked (discharged)
b. If $X°$ discharges a thematic role in some position Y, then it discharges only
one role in that position.

A word of caution is certainly needed here. In saying that each argument
position is assigned 'one role', we mean that each position is assigned one *role index* (a
variable, a number etc. which sends to the appropriate conceptual content in the
predicate's LCS. (θ-role labels are no longer part of a-structures). Moreover a variabale
in an a-structure often represents more than one "role". This position is relatively
explicit in Grimshaw's description, where prominence relations are jointly determined
with reference to two conceptual domains. Every external argument is the most
prominent on two dimensions, so a variable representing an external argument really
abbreviates two roles: e.g. in *John broke the window, John* is Agent and Cause. More
complex situations are also possible: *He deliberately rose, he* is Theme/Agent/Cause.
An index variable in an a-structure may stand for a cluster of conceptually compatible
roles and it is incumbent on θ-Theory to define such compatibilitites (see relevant
research in Jackendoff (1987), Emonds (1989) a.o.).

5. On the relation between θ-grids and subcategorization features.
In the form we have presented the theory so far, there is an unwanted and
certainly inelegant redundancy between subcategorization features and θ-grids. Thus
both give information about the verb's adicity indicating how many arguments it takes.
Moreover since θ-grids have prominence relations defined on them, one may indicate
more or less directly in the θ-grid how the several arguments are realized syntactically
(e..g. in the preceding chapter we have seen a proposal to directly mark in the θ-grid
the direct argument as well as the external argument).

Moreover Chomsky (1986a) shows that it is even possible to derive *categorial
information* from θ-grids. Picking up an idea of Grimshaw's (1979, 1981), he shows
that there is a reliable correspondence between semantic cognitive categories (e.g.
object, action, agent) and syntactic categories (NP, V, etc.). Cognitive categories have
what Grimshaw calls a *canonical structural realization* (CSR); here are examples:

(56)   CSR (object) = N, NP   (*Peter, the wolf*)
        CSR (action) = V (*run*)
        CSR (question) = S' (*Who came? I asked [who came]*)
        CSR (proposition) = S' (I believe [that he is honest])

Therefore. Chomsky argues, if one knows what roles a predicate *semantically
selects (s-selects)*, one implicitly knows what syntactic categories the predicate selects,
that is, one knows the predicate's *c-selection (categorial selection)*. For instance, if it is
known that *believe* s-selects (Experiencer.(Proposition)), it can be assumed that it

c-selects that (NP, S) and this is indeed the case (*I believe that this theory is nonsense*). Therefore given that there is a canonical structural realization for semantic categories, categorial information can be inferred from θ-grids. But if this were true, subcategorization rules - whose main function was to indicate the number and syntactic category of the arguments - appear to be truly redundant, and could be given up.

While there is a great deal of truth and beauty in this idea, it has been persuasively argued (cf. Grimshaw (1979, 1981), Rothstein (1991), Czepulch (1991), Webelhuth (1982) a.o.) that, at least at the present stage of research, subcategorization rules cannot be given up, at least as descriptive tools. A classical argument for well-tempered subcategorization comes from Grimshaw (1979, 1981), who discusses verbs that take sentential complements. We will illustrate her point using the verbs *ask* and *inquire*. Both *ask* and *inquire* s-select (Agent (Question)). Therefore, on the strength of the principle of CSR, it follows that they c-select [NP---S] and this is precisely what one finds.

(57)   a. I asked what time it was.
         b. I inquired what time it was.

However, the syntactic facts are more complex. The verb *ask* can also realize its Question role as an NP (or "concealed question" in Grimshaw's words); the verb *inquire* does not have this possibility, and these facts do not follow from the CSR of questions.

(58)   a. I asked the time.
         b. *I inquired the time.

The example leads to an important qualification of the relation between s-selection and c-selection, which can be expressed as follows:

(59) Certain cognitive semantic categories (e.g. θ-roles) have corresponding syntactic categories in the *unmarked* case (i.e. they have a canonical structural realization).

The concept of CSR expresses what is predictable, regular in the syntax of a word, i.e. how much of its syntax can be guessed from its meaning and need not be learned. Thus, we know that if a predicate selects a semantic type, it is subcategorized for the CSR of that semantic type. Both of the verbs above conform to this principle and, significantly, there is no verb in English that s-selects (Question) but is subcategorized only for [-- NP] and not for [-- S]. However, the fact remains that the CSR does not exhaust the syntactic realization of a role, and that this kind of marked syntactic information has to be listed in the lexicon; it will be listed in the subcategorization frames, which should not be eliminated. There is no way of guessing that (Question) is realized as [-- S] or [-- NP] for *ask*, but only as [-- S] for *inquire*.

Therefore, categorial information is predictable only in part from θ-grids; the less predictable part needs to be listed in subcategorization frames. Moreover, subcategorization information viewed as head-head selection is surely needed to indicate the selection of subcategorized prepositions (e.g. Admitting that *look for* and

seek s-select (Agent (Theme)), it is difficult to guess that (Theme) is realized as a PP headed by *for* with *look,* since the CSR for Theme is NP, not PP; *seek* , on the other hand, conforms to the CSR). One other area where subcategorization is needed, because the relation between syntactic and semantic categories is fairly indirect, is that of morphologic cases. It seems hard to explain in terms of a role and their CSRs, why the Experiencer appears as an Accusative in *Mă mănâncă nasul,* but as a Dative in *Îmi curge nasul.*

But beyond these descriptive problems there is the fact that subcategorization features are more "tangible" than θ-grids. Remember that because of the insurmountable difficulty of defining roles with any precision, θ-role labels have been eliminated from a-structures, so that a-structures have become mere sets of variables arranged in order of relative prominence and connected to variables in LCSs. The substantive content of a the role, the respective cluster of entailments true of a (referent's) role, is given by LCSs. One also encounters similar substantive difficulties in setting a hierarchy of roles; there are several proposed hierarchies in the literature which, although being in agreement over a large area, may nevertheless differ in details.

Conceived of as prominence relations between arguments, θ-grids represent a fairly abstract level of lexical representation, with considerable explanatory power, as we hope to have shown. At the samet ime, a-structures seem to be really too abstract to encode the wealth of morpho-syntactic information characterizing a lexical item. This information can be encoded in subcategorization frames which continue to be descriptively unavoidable.\

6 The Projection Principle.

When the argument positions and therefore the elements occupying them have received a thematic index all the relevant information from the lexicon has been taken over by the syntax. The subcategorial information was used in the projection clauses and the argument positions (objects and subject) have been *thematically* identified .As shown above, this type of lexical information is essential for the functioning of syntax, as well as for semantic interpretation. This is why this information has to be *conserved,* preserved during the derivation. This requirement on the preservation of lexical structures is known as the Projection Principle.

(60) <u>Projection Principle</u> - Representations at every syntactic level (D-Structure, S-Structure, Logical Form) are projected from the lexicon in that they observe the subcategorization and thematic properties of lexical items.

This has two consequences:
(i) subcategorization positions must be present at all levels of syntactic representation;
(ii) subcategorized positions will count as θ-marked throughout the derivation.

Consider sentence (60), where *bake* has the subcategorization feature [--[N°]ʃ
]ₚ for]] and the a-structure (Agent (Benefactive(Theme))).

(61) [You]_{Agent} baked [this pie]_{NP} [for the kids]_{PP} D-Structure
          Theme   Benefactive

The subcategorized positions (and the subject) have been θ-identified by
indexing with θ-roles. If either of the objects moves, an empty element called a *trace*
will remain in the initial position.

(62)   a. [What]_{NPᵢ} did you bake [tᵢ]_{NP} [for the kids]_{PP}?.. S-Structure
        b. [For whom]_{PPⱼ} did you bake [this pie]_{NP} [tⱼ]_{PP}

Informally, a *trace* is a phonologically null category (NP, PP, etc.) left behind
under movement. The trace is coindexed with the moved constituent and forms with it a
chain; generally, an NP (or PP) together with any traces coindexed with it is defined as
a *chain*; coindexation shows coreference of the elements in the chain. Thus, (NPᵢ, tᵢ) in
(62a) and (PPⱼ, tⱼ) in (62b) are chains. The traces in examples (62) indicate the
subcategorized positions and, therefore, the syntactic functions and the thematic roles of
the displaced constituents. For example, the trace tᵢ in the cahin (*what*ᵢ, tᵢ) indicates that
what is a DO and that it is thematically a Theme, while tⱼ in the chain (*for whom*ⱼ, tⱼ)
shows that *for whom* is an Indirect Object thematically interpreted as a Benefactive.
The S-Structures representations in (62) preserve the subcategorization and thematic
properties of the verb *bake*, as required by the Projection Principle.

6.1. It is also part of θ-Theory to define the θ-role assigning categories and the
manner (direct, indirect, compositional) in which categories assign roles. The
assumption is that a head may directly θ-mark *only one sister NP*. Typical
configurations of direct θ-marking are those shown in (62).

(63)   a.
                        V'
           V ----------- NP(2*)
           (1, 2*)' |
           see   her

        b.
                        P'
           P ----------- NP

Among the major open lexical categories (N, V, A), the verb stands out as an
essentially relational category (cf. Emonds (1985), as testified by its ability to directly
assign a θ-role to an NP. This NP is for this reason called a Direct Object and it gets
Accusative case marking (e.g. *see her*). Unlike verbs, As and Ns assign roles indirectly
by means of prepositions (or oblique case inflections).

Prepositions are like verbs in that they occur with sister NPs (see (62b)) which
they θ-mark directly; they assign θ-roles *directly and independently* (only) when they
have *full meaning*, as is the case in examples (64):

(64)   The painting is by Picasso. (Agent)
         The road is to London. (Goal)
         He is from London. (Source)

In English, As and Ns do not govern sister NPs; they relate to NPs only by means of prepositions, as illustrated below. They assign θ-roles *indirectly*.

(65)   V   N

a.   destroy the city   b.   destruction of the city
       read the book   reading of the book

c.
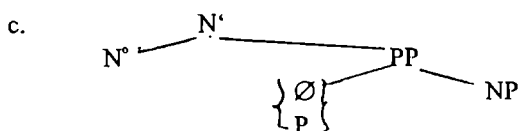
(66)   V   A
a.   like Mary   b.   fond of Mary
       know the truth   aware of the truth

c.
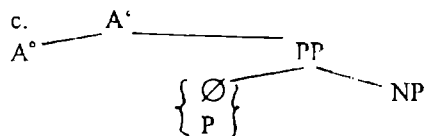
Thus, even if in order to maximize the similarity between related verbs and nouns, or related verbs and adjectives, we supposed that certain nouns or adjectives were subcategorized as [+ -- NP] in the lexicon, the only way this argument of a noun or adjective could get a θ-role is through a PP structure i.e. subcategorization requirement can be satisfied only by a $[P \frown NP]_{PP}$ sequence which is sister to the head; the unmarked preposition corresponding to transitive verbs in derived nominals is *of*. Since *of* is predictable and does not have to be learned with each deverbal noun (*reading, building, construction*) we may assume that the P node is empty in (65c) and that *of* is inserted at S-Structure, as a means of θ-role assignment and case realization. There are also nouns related to verbs which use some other idiosyncratic preposition to mark the object: *answer to the question, *answer of the question*, but *answer a question*. Such prepositions are listed in the lexicon and projected onto D-Structures. The defective nature of nouns as θ-markers is clearly seen in the irregular behaviour of nouns derived from transitive verb: some mark the object with the predictable *of*, others use an entry-particular P, while others do not have any object corresponding to the DO of the verb:

(67) describe a city   the description of a city
      promise a reform   the promise of a reform
      answer a question   answer to / *of a question
      marry Sue   his marriage to / *of Sue   \
      She received a phone-call   *her reception of a phone-call
      He anxiously expected the news.   *his anxious expectation of the news

The difference between Vs on the one hand and As and Ns on the other is noticeable in case-languages like German and Romanian as well. Verbs directly θ-mark the DO assigning it Accusative case. Complements to N and A may have the status of PPs, as they do in English: R *a iubi arta: iubitor de artă, achiziţiona cărţi: achiziţionare de cărţi; mândru de fiul său.*

But in case languages, complements to Ns and As may also appear in oblique case forms, e.g. in Romanian or in German they may be in the Dative or Genitive, not in the Accusative case (R *achiziţionarea cărţilor* (Gen), *om drag mie* (D)). The oblique case inflection has the same function (and perhaps the same structural position) as the preposition in (65) or (66): it "helps" the N/A to discharge a role in its grid to an argument position; oblique cases (unlike the Nominative or the Accusative) a¨˙ associated with a limited number of θ-roles of which the head N/A specifies one.

We retain that Ns and As are *indirect assigners*. Verbs may directly θ-mark only one argument; a second argument will be marked indirectly by means of oblique case inflections or prepositions. When the role is jointly assigned by the verb and the preposition, the interpretation of the preposition itself is more or less dependent on the verb, as illustrated below:

(68) The book is on the table. (Location)
      They blamed the accident on John. (Theme)
      For John everything should be possible. (Benefactive)
      He was waiting for John. (Theme)

7. Word order and the direction of θ-role assignment.

In a preceding chapter we identified one parameter in setting up the word order of phrases across languages: this was the headednesss parameter, distinguishing between head-initial languages like English and head-final languages like Japanese.

A distinct word order parameter is that of the *direction of θ-role assignment*, which also gives us the direction of *canonical* government in a language (cf.Travis(1984), Koster(1987); for a different proposal regarding word-order and language-type, see Kayne(1993)). Most of the time the head initial / head final parameter and the direction of θ-role assignment parameter coincide; the result is that both constituents θ-marked by some head and constituents which are not θ-marked by that head are on the same side of the head. Thus, in the following English example both the objects and the adverbial adjuncts are on the right side of the verb: [*They* [*met their friends*] *quite by accident in the park, yesterday*].

Yet, there are languages like Modern Mandarine in which the two parameters do not coincide (cf. Travis (1984), (1989: 266-69)). Mandarine is a head final language and it assigns θ-roles to the right. Consequently, we find the following word order pattern: a) Nonsubcategorized clauses and nonsubcategorized PPs, which are not dependent on the verb for θ-marking, precede the verb, because the language is head final; the structure is (S) (PPs) V

(69)   a.   cong you gu chulai
              from dark valley emerge

b) Subcategorized constituents, the DO and the POs θ-marked by the verb, follow the verb, because the direction of role-assignment is to the right; the structure is V NP PP$_1$.

(69)   b.   ta ba Lizi pian - le
              he ba Lizi cheat - ASP
              'He cheated Lizi'

Interesting corroborating evidence comes from the study of two prepositions that appear both preverbally and post-verbally "gei" (to/for) and "zai" (at). Their interpretation changes function of their position 'gei NP' before a verb is interpreted as an independent (nonsubcategorized) Benefactive; 'gei NP' after the verb is interpreted as a subcategorized Goal.

(70)   a.   ta gei wo mai le chezi le
              he for me sell ASP car ASP
              'He sold a car for me'
        b.   ta mai gei wo chezi le
              he sell to me car ASP
              'He sold a car to me'

The preposition zai is interpreted as a locataive adjunct when it precedes the verb, and it is interpreted as a Goal directional preposition introducing a subcategorized NP, when it is post-verbal.

(71)   a.   Zhang - san zai zhuozi - shang tiao
              Zhang - san at table - on jump
              'Zhang - san is jumping (up and down) on the table'
        b.   Zhang - san tiao zai zhuozi - shang
              Zhang - san jump at table - on
              'Zhang - san jumped onto the table'

The same distinction between locative adjunct and directional object is grammaticalized in German through case marking, the locative adjunct is in the Dative case, the directional object gets Accusative case marking from the verb:

(72)   a.   Sie arbeitet im Geschäft. (Dat.)
           'She works in the store'
       b.   Sie geht ins Geschäft. (Acc.)
           'She goes into the store'

8. θ Theory and Government Theory.

In this last section we examine the interface of θ-Theory and other subtheories, such as the theory of government and of movement.

Government of ß by α was defined as follows:

(73)   Government
       α governs ß iff
       a. α is a X°, for some Y (i.e. α is a (lexical) head)
       b. α c/m - commands ß
       c. For all maximal projections γ, if γ dominates ß, then γ dominates α

We note in passing that since the relation in (73) holds between a head and a maximal projection, it is also called head government. Among the permitted government configurations some represent stricter relations between governor and governee; these are usually referred to as relations of *proper government*. Certain syntactic processes, for instance wh-movement, require proper government, in the sense that the trace left behind should be not merely governed, but properly governed. θ-Theory allows the specification of one proper government configuration. At the same time it will allow a better characterization of the notion barrier. It is these questions that we are now addressing

One configuration of proper government is that of *θ-government,* simply defined as in (74) (cf.Chomsky 1986b).

(74)   θ-government
       α θ governs ß, iff α is a head, α θ-marks ß, and α is a sister to ß

There are two elements in this definition, both of which have been used in the further development of government theory. a) θ-government is a semantic relation, an instance of s-selection between two categories, a head α°, and a complement ß receiving a θ-role from the head. When furthermore the θ-governor is a *lexical* constituent (as opposed to being some grammatical formative), we will say that α° L-marks ß.

(75)   L-marking.
       α° L-marks ß, iff α° is lexical and θ governs ß.

L-marking is an important form of identification (identification of an argument by the predicate which assigns it a thematic role). b) The second element in the definition of θ-government is a configurational one; θ-government is a relation between a head and a *sister complement*; therefore θ-government is *head government within the first projection of the head*.

(76)
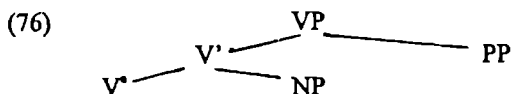
Examining (73), we see that V° θ-governs NP, which it θ-marks within the first projection V, but V° does not θ-govern the PP although it governs it. It is now possible to define (one configuration of) proper government as in (76):

(76) Proper government

If α° θ governs ß, then α° properly governs ß.

To illustrate the relevance of proper government, let us examine the questions in (77) and (78), keeping in mind the fact that the traces left behind by wh-Movement must be *properly governed*.

(77)　　a. They should wellcome this other guest with more ceremony.
　　　　b. Who$_i$ should they wellcome t$_i$ with more ceremony?
　　　　c. How$_j$ should they wellcome this other guest t$_j$?

(78)　　a. They wondered [whether they should wellcome this other guest with so much ceremony].
　　　　b. ?[Whom$_i$ did they wonder [whether they should wellcome t$_i$ with so much ceremony]$_s$]$_{s'}$?
　　　　c. *[How$_j$ did they wonder [whether they should wellcome this other guest　　t$_j$]$_s$]$_{s'}$?

In the simple sentences of (77) the proper government requirement on traces is met (though at this point we cannot yet understand exactly how this happens). Sentence (78a) contains (77a) embeded as an indirect question complement, both (78b) and (78c) involve questioning (extracting) constituents out of an indirect question, a process which is known to produce less than perfect results; but even if question (78b) is not impeccable, it is comprehensible and significantly better than (78c), and it is this contrast that we want to explain. Other things obviously being equal, the difference between (78b) and (78c) lies in the fact that in (78b) we have fronted a DO, while in (78c) we have fronted an adjunct. The trace left below by the DO is *properly governed*, since the V θ-governs its DO complement (see (76)); hence (78b) is a licit question. In contrast, in (74c), the trace left behind by the adjunct is not properly governed. The

manner adjunct *how* is not θ-governed, it does not receive one of the roles in the predicate's θ-grid and it is not a sister to the verb. Hence movement out of the manner adjunct position is not possible in this case. Intuitively, the verb can identify an argument, but not an adjunct.

8.1. The concepts introduced above also enable us to refine the notion of *barrier*.

As already mentioned a barrier that prevents government of β by α° is a maximal projection that contains β but does not also contain α° (The definition of government requires that α° should m/c-command β and that they should be included in *all* of the same maximal projections). A barrier is an "intervening" maximal projection. It has been shown that maximal projections are not barriers inherently, but only relative to a context. Chomsky (1986b) proposes that only *a maximal projection which is not L-marked is a barrier*.

To illustrate the relevance of L-marking for barrierhood we will again resort to question formation, on the hypothesis that *barriers block not only government, but also movement (extraction)*. Huang (1982: 305) has proposed that a constituent may be moved only out of a domain which is properly governed, i.e. only out of a maximal projection which is not a barrier (=The Condition on extraction domains):

(79)   Condition on extraction domains
A phrase A may be extracted out of domain B only if B is properly-governed.

Consider now the following examples.

(80)   a.She left [$_{PP}$before buying Chomsky's book]
        b.*What, did she leave [$_{PP}$before buying t,]

(81)   a.   She said [$_S$she had bought Chomsky's book]
        b.   What, did she say [$_S$she had bought t,]

In both (80b), (81b), we have extracted a DO, therefore the trace t, itself is properly governed. The difference between (80b) and (81b) has to do with the extraction domain. In (80b) the extraction domain is an adjunct PP (a time adverbial) which is not L-marked (because it is not θ-governed). The PP node is a *barrier*, and is sufficient to block movement. In contrast, in (81b), the extraction domain is a DO clause (as the case had been in (78b,c), which is θ-governed and L-marked, so that the S maximal projection node is *no longer a barrier* and extraction is allowed. We retain that L-marked maximal projections are not barriers for movement or for government, because they are thematically identified.

Chapter 8

DEVELOPMENTS IN THE THEORY OF PARTS OF SPEECH
LEXICAL AND FUNCTIONAL CATEGORIES
THE THEORY OF HEAD MOVEMENT

1. Two approaches to the problem of defining parts of speech. Parts of speech in categorial grammar. An important question in the theory of grammar is that of defining the possible syntactic categories of a language and also of finding means of expressing similarities and differences between them. The task facing the linguist is that of constructing a theory of natural language categories, including a theory of the parts of speech. The linguistic scene of the Anglo-American world in the last decades has been dominated by two approaches to this problem: a) *a semantic referential approach*, characteristic of categorial grammars and ultimately developing Fregean ideas; b) *a distributionalist approach* characteristic of structuralist schools, in any of their variants.

1.1. Parts of speech in categorial grammars. In this tradition, parts of speech are defined on the basis of their extralinguistic denotation. There is an *assumed correspondence* between *text structure* and *world structure*, in other words, between *linguistic categories and ontological categories*; parts of speech designate particular kinds of real-world entities.

A second leading idea, an idea, already explored above, is that languages have *functional structure*. Each statement can be taken to be built by the application of some function (an unsaturated expression) to some arguments(s). Not all lexically simple (parts of speech) or complex expressions (phrases) behave alike with respect to the function/argument distinction. To be more specific, there are two types of expressions which are *inherently saturated* or *complete* (they are arguments, rather than functions). These are the categories noun *('n'*), in fact, NP, and 'sentence' *('s'*), which are taken as *basic* (underived) syntactic categories. They designate the important ontological categories of 'entity'or 'individual' and 'truth'. It is assumed that, through its sense, an expression such as *the winner of Austerlitz* picks out the unique referent which is Napoleon; a sentence such as *'It is snowing'*, through its sense, depicts a state of affairs; when the state of affairs corresponds to the real world, that is, at those time intervals when it is snowing outside, the sentence *'It is snowing'* is true, and it is false, otherwise. This is what is meant by saying that the referents of declarative sentences are truth values: 'truth', when the depicted state of affairs corresponds to the situation in the outside world, falsity, when this correspondence fails to obtain.

The syntactic categories *n* (NP) and *s* are *basic*, underived categories and wil! serve to define the other categories (verb, adjective, adverb, VP, AP, etc.), which are *derived categories*.

Derived categories are defined as functions (from one category into another) starting from the basic categories. For instance, the category intransitive verb is defined as *s/n*, that is, it is a function which, when it is applied to a noun (phrase), yields a sentence: e.g., *run (John)* → *John runs*. In a more perspicuous notation, reminiscent of the cancellation of fractions, we may represent the application of the function to the argument to produce a higher expression as in (1).

(1)   John   runs
           n   s/n
               s

An adjective is a category which combines with a noun and yields another noun, therefore, an adjective is a function from the set of nouns into the set of nouns: *n/n*.

(2)   little   John
           n/n   n
              n

An adverb (e.g., *slowly*) is a function which takes an intransitive verb (e.g., *run*) as an argument, and yields another intransitive verb (e.g., *run slowly*). The category of the adverb is *v/v*, or expressing the same thing in terms of basic categories (*s/n //s/n*).

The categories index the items in the lexicon, that is, the vocabulary of the language, as well as the higher expressions produced by the grammar. As has been understood from the examples, the categorial index shows a manner of combination, having quite the same role as a (sub)categorial feature. For all categories, except the category `s`, there are *basic expressions*, i.e., words belonging to a given category. Here are examples:

(3)   n   {John, Lizzy. snow...}
           n/s   {run, sleep, walk away...}
           n/n {little, red. tall...}
           s/n//s/n {slowly, fast, well}

The cateogory `s` contains only derived members. A characteristic feature of categorial grammars is that the categories do double duty: a) On the one hand, as already shown, they *classify the vocabulary*, determining for each syntactic category A the set of basic expressions of category A (see (3)).b) On the other hand, the categories indicate the way in which elements combine to form higher constituents, therefore,

categories *implicitly contain the syntactic rules* of the grammar. Ignoring the actual linear order of the constituents, these rules are of the following form: If a is an item of category A/B and b is a constituent of type B, then the expression resulting from the concatenation of a + b is a constituent of category A.

Such a grammar, which essentially relies on a procedure of defining a system of categories is for this very reason a *categorial grammar*.

A categorial grammar is essentially an indexed vocabulary. The syntactic rules are 'inscribed' in the categorial indices, so the categories have replaced the rules. The definitions of the categories are built stepwise, starting from the basic ones , n and s. *Since n and s are correlated with basic ontological categories, entity and truth, respectively, the system indirectly provides a referential (denotational) interpretation for the other derived categories as well.* Categorial grammar semantically models the system of syntactic categories of a language, offering a sophisticated procedure of analyzing and defining parts of speech with respect to their denotation, and this is an enterprise of considerable philosophical interest.

Categorial grammars, i.e., indexed vocabularies, may serve as both analytical and synthetic procedures, as can be illustrated by analysing an easy example: *Little John sleeps soundly.*First, categorial grammars may function as analytic, identification and recognition, procedures. They offer a completely mechanical means of determining whether a string is well-formed, through the application of cancellation rules. If only one categorial index remains after the concellation rules have applied, the string is well-formed, and this last exponent shows to what syntactic category the string belongs. Using this mechanism as in (3), we can show that *Little John sleeps soundly* is a well-formed sentence string.

(4)   Little   John   sleeps   soundly.
       n/n   n   s/n   s/n//s/n
       n   s/n
                       s
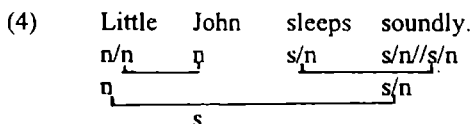
Categorial grammars may also function as synthetic grammars. A complete indexed vocabulary enables one to synthesize all possible sentences of the given language without any additional rules. Then, we might reverse the direction of the analysis in (4) and "generate" the sentence in (4), as in (5).

(5)   s
                 n   n/s
       n/n   n   n/s   n/s//n/s
       little   John   sleeps   soundly
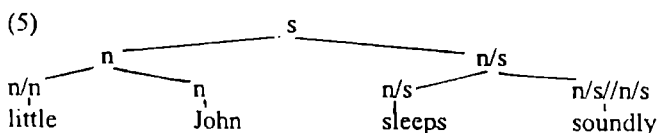
Categorial grammars are context-free and, hence, can be subject to any criticism which can be levelled at context-free grammars (see Chomsky (1957)).

An important result is that categorial grammars are weakly equivalent with phrase structure grammars (cf. Cooper(1975)); the weak equivalence of two grammars means that they generate the same language, the same strings, though they need not assign the same analysis to these strings.

The basic insight of simultaneously classifying expressions, according to their semantic and syntactic properties, so that a grammar defines a formal ontology, comes down from Frege. Categorial grammars, developed by Ajdukiewicz (1935), Bar-Hillel (1953, 1966) a.o., are extensively used in logico-semantic analysis. An enriched and highly sophisticated version of categorial grammar, extensively used by linguists and philosophers alike, is Montague Grammar, named after the American philosopher and logician Richard Montague (see Montague (1974)).

The endeavour to offer a semantic referential analysis of syntactic categories and, thus, of the parts of speech, and, more generally, the attempt to find out about the hidden structure of meanings in a language and culture are part of a research programme that Bach (1981) defined as "the study of natural language metaphysics". This programme of *interdisciplinary research* drawing on philosophy, logic, linguistics and cognitive psychology represents a major intellectual achievement in the study of language in the Anglo-American world, in the latter half of this century. A significant development over the last ten years is a gradual rapprochement of research in syntax and formal semantics, leading to a better motivation of both syntactic and semantic analysis and to a considerable progress in the understanding of traditional linguistic problems (e.g., aspect, mass terms, plurality, predication, reference, quantification, etc.).

2. The structuralist tradition in the analysis of parts of speech.

The second direction in the contemporary investigation of parts of speech is *syntactic*, formal. Continuing the classical structuralist tradition, parts of speech are viewed as *distributional classes*. Classical structuralism, at least as illustrated by Harris, Nida, Wells or Fries, attaches *no special substantive significance* to parts of speech, i.e., to the 'conceptual content' of Ns, Vs, etc. Fries (1957) goes as far as rejecting even the names 'noun', 'verb', preferring to speak of word of class number 1, 2, ...n. It was generally agreed that 'noun', 'adjective', etc were simply convenient labels in setting up systems of paradigms based on distributional regularities. For example, under the label 'verb' in English, one groups all and only those formatives which appeared in the environments: -s, --ed, --ing, to-- (*askS, askED, askING, TO ask*).

The same basic attitude is embraced by the generative school, where categories (lexical N, V, etc. or grammatical NP, VP, etc.) are defined only through their role in the rules and principles of the grammar. This attitude is the belief in *formal definitions*, which is the defining feature of all structuralist approaches.

However, while structuralist grammarians insist that the parts of speech system of languages can vary without predictable limits, over the past twenty years, there has

been a more or less explicit assumption that parts of speech systems do not vary arbitrarily and without limit. One has come to acknowledge the relation between categories and notions (conceptual contents); but this relation is viewed as rather more arbitrary, from the point of view of semantics, though not from the point of view of linguistic structure.

In the currently accepted view, the system of syntactic categories functions as a grid, cutting through notional space and inducing its own divisions. The grid is completely part of the linguistic system, its motivation must be formal. A familiar argument in favour of this position is that grammatical processes appear to involve a considerable number of elements and relations that would have to count as degenerate under any strictly notional interpretation, such as, say, the expletive subjects *there* and *it* in English, in sentences like *There is a lily on his desk*, *It is drizzling*. One may wonder about the θ-role assigned to the subject of weather verbs like *drizzle, rain, heil, snow*, etc. Yet, this notionally empty subject is sufficiently like a referential NP to serve as an antecedent in sentences involving coreferential relation such as those in (6) below:

(6)   a. He sang enough [e] to drive me crazy.
       b. It rained enough [e] to make the ground ooze.

Thus, in (6a), *he* serves as the antecedent of the implicit subject of the infinitive [e]; [e] is coreferential with *he* ('He sang and he drove me crazy as a consequence'). Example (6b) shows that *it* has the same role and serves as an antecedent for the implicit subject of the infinitive clause, behaving like an ordinary argument; *it* is in fact a *quasi argument* (cf. Chomsky (1981)). An auxiliary verb like the English DO in direct questions or negative sentences (*Did he come?*, *He didn't come*) provides an example of a semantically degenerate verb. Syntactic categories may, therefore, have degenerate members whose presence is due to the formal requirements of the language. The categories of a language will have to be set up on the basis of the combinatorial properties they exhibit, but we expect that it will turn out that there are interesting and reliable relations between the syntactic, combinatorial properties of a category and the notional interpretation of that category. Syntactic categories are semantically motivated, at least, in part. *Partial semantic motivation is one basic source of similarity between parts-of-speech systems.*

An important insight of more recent syntactic theory has been that there are similarities between various parts of speech, similarities which could be represented in terms of *shared features*. Categories are no longer viewed as atomic entities, but as analyzable into bundles of syntactic features, expressing their properties and their similarities. For instance, in English, adjectives and manner adverbs are sufficiently alike (e.g., pairs like *slow/slowly, careful/carefully*) to warrant inclusion in the same basic category; they share the morpho-syntactic property of comparison and they share the semantic function of modification; adjectives modify nouns (*careful driver*),

adverbs modify verbs (*drive carefully*) in analogous phrases; they will be differentiated in terms of a minor syntactic feature.

The suggestion is to think of parts of speech systems as constituted on the basis of a few prototypic syntactic oppositions that each system acknowledges. The central constitutive opposition for parts of speech systems is the opposition between verbal and nominal categories; parts of speech are interpreted along the dimension s ±N, ±V (as proposed in Chomsky's important paper "Remarks on Nominalization" (1971)): The possible combinations of features define four major parts of speech: N (noun), A (adjective), V (verb), P (adposition, that is, preposition or postposition) and also their projections (through percolation), as in (7b). The features function as a kind of *prototypical nucleus* or *generating matrix* for syntactic categories.

(7) a. ± N, ± V

b.

NP	AP	VP	PP
N	A	V	P
[+N	[+N]	[+V]	[-V]
[-V]	[+V]	[-N]	[-N]
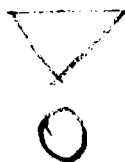
Shared features express cross-categorial regularities of behaviour. For example, the [+N] categories may be marked for gender, number and case; the [-N] categories (i.e., the verb and the preposition) are direct θ-role assigners and direct case-assigners; further semantic or syntactic features will partition the classes in (7b), so that we separate particles from prepositions, adverbs from adjectives, enlarging the number of distinct categories. The cluster of features in (7) defines possible parts of speech, but a language may fail to lexicalize one of the categories in (7b). There are languages where there are no English type adjectives (Swahili is an example). Other languages lack a separate class of adpositions, using certain nouns instead (This appears as less surprising when one remembers the many NPs used prepositionally in Romanian: *în faţa, în spatele, din partea*, etc.). Languages are certainly expected to differ in the way they subcategorize the major parts of speech in (7b); Romanian prepositions are always transitive. There is no category of "particles" in Romanian as proved by a cursory examination of examples like: *He wasn't in the room./He wasn't in* vs *El nu era în cameră. /*El nu era în*. Certain patterns of cross-linguistic variation are now easily understood.

All parts of speech system will, nevertheless, sanction the opposition verbal/nominal. A second opposition, which is universally acknowledged, is that between *lexical* or thematic categories and *functional* categories. The opposition between lexical and functional categories is *in part* the same as the structural distinction between open *classes* (N, V, A) and *closed classes* (e.g., Determiners). To understand this important concept, we will start by examining a major functional category in English, the category of Inflection (INFL or 'I'). The analysis of INFL

in English carries over to other languages; at the same time the understanding of INFL in English will permit a more general characterization of the concept functional category.

3. Introducing functional categories. Inflection.

Inflection is a prototypical functional category with a central role in the syntax of the sentence. As far as English syntax is concerned, Infl (I) is another name for the category Auxilliary. The new name attempts to be a more general label, suited to refer not only to auxiliary verbs, but (primarily) also to the system of inflections used to mark moods and tenses in various language (E -s (*goes*), -ing (*going*) R -re (*citire*) etc). As one moves away from the early Chomskian analysis used so far, it will be seen how, under the pressure of theory-internal considerations, a language particular description of a category has turned into a description which is of general validity.

3.1.The English auxiliary system was assumed to have the structure in (8), (cf.Chomsky (1955,1957):

(8) Aux → T⌢(M)⌢(have-en)⌢(be-ing)

Examine now the paradigms below, involving question formation and tag-question formation.

(9)   a.   Could he come?
         b.   Has he come?
         c.   Is he coming?
         d.   Did he come?

(10)   a.   He couldn't come, could he?
         b.   He hasn't come, has he?
         c.   He isn't coming, is he?
         d.   He didn't come, did he?

All examples involve movement of an auxiliary round the subject, and in each individual case, we have clearly contradicted an important requirement on Move α and on transformational operations, the requirement that *rules operate on constituents*. In each case, what has moved is the sequence *Tense affix + tense carrier* (the tense carrier being one of the auxiliaries *can, have, be, do*), this sequence is clearly not a constituent with respect to the analysis of the Auxiliary given in (8). A partial solution to this problem was to modify (8) as in (11),(cf Culicover(1976)):

(11)   a.   Aux → Aux₁ ⌢(Aux₂)
         b   Aux₁ → T⌢M
         c.   Aux₂ → (have-en)⌢(be-ing)
         d.   T → s, ed
         e.   M→ can, may, shall, will, must, ∅.

The Aux has been factored into two constituents (in (11a)), one of which, Aux_1 is obligatory; so now, not only the tense constituent T is obligatory, but so is the modal constituent, which is also part of Aux_1. Inversion can consequently be stated as a rule that moves Aux_1 around the subject (cf.(13)). This analysis has the desirable result that question formation and tag formation in (9a), (10a) involve movement of a constituent .If the Modal position is not filled in the underlying structure, but there is an auxiliary verb (*have-en* or *be-ing*) in Aux_2 , the closest verb to Aux_1 from Aux_2 moves under Aux_1 and fills the Modal position, as in (14).

(12)

```
                                    VP
                 Aux _____       MV
       Aux₁                   Aux₂
T           M      (have-en)        (be-ing)
ed          can
            do
```

(13)   X   NP   Aux   Y ⇒   X   NP   Aux   Y

(14)

```
                          VP
                 Aux _____  MV
       Aux₁               Aux₂        |
T           ⎰ M ⎱  be       ing    come
ed          ⎱ Ø ⎰
```
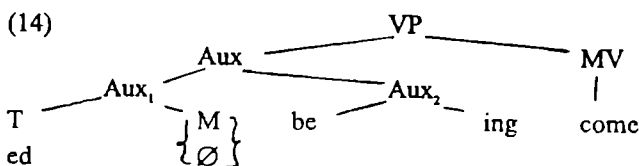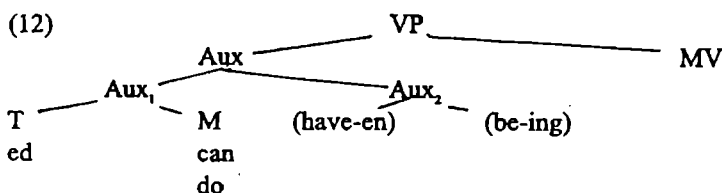
This rule was referred to as *Have/Be*-Raising. The newly formed Aux₁ may now be subject to movement, so that a constituent is moved in (9b,c), (10b,c). Finally, if there is no auxiliary verb in addition to the tense affix, and Inversion has to apply, the auxiliary DO is inserted in Aux_1 as shown in (12), and then Inversion is free to apply, and will operate on a constituent.

3.2.We could make the following comment on this analysis: a) As a theory-internal consideration it appears that rule (11a), which is a phrase structure rule, is still fairly irregular, with respect to the general priciples of X-bar theory; thus, the categoty Aux does not have an X° head, violating endocentricity). b) As a descriptive problem, there is an important difference in English, between the aspectual auxiliaries and the modal verbs, which the analysis ignores. The modal verbs depend on the Tense affixes, they are defective, and have only finite present and past forms (*can, could, *to can, *canning*). In contrast, aspectual markers are found in finite and non-finite moods, alike (e.g., *his having run, to be running*, etc). *Have* and *be* are not dependent on Tense, and need not be generated in the same constituent as Tense. These descriptive considerations lead to the conclusion that only modals (unlike aspectual auxiliaries) should be generated under the same Inflection node as Tense, in a rule like(15):

(15)   I⁰ → (± Tense, ± Agr) (Modal)

In (15), Inflection is analysed as a head, specified for the features (± Tense), which covers the present/past opposition (*They walk./They walked.*), and (± Agreement) signalling agreement between subject and predicate in finite clauses (*He walks./We walk.*). A modal is optionally present (*He can come./He could come./He came.*).

An idea that has emerged in recent syntactic theorizing is that *clauses are headed constituents* and that the head of the sentence is I⁰. Sentences are analysed as Inflectional projections This is a significant departure from earlier structural theory, which viewed the sentence as an exocentric (non-headed) construction. Some of the descriptive arguments that support the claim that I⁰ is the head of the sentence are the following: a) Inflection entertains structural relations with both of the sentence's major constituents, the subject NP and the VP. The relation between I⁰ and VPs has long been known. A VP (e.g., *live in London for ten years*) cannot be used in an independent sentence, unless it is inflected for some mood and tense (**He live in London for ten years. / He lived in London for ten years*). The VP may be viewed as the *obligatory complement* of an inflectional head, and the dependence between Inflection and VP may be expressed as an instance of the *head complement* relation:

(16)   I' → I⁰ ˆVP

b) Of late, the relation between the subject and Inflection has come under close scrutiny. In finite clauses, there is agreement between Inflection and the subject (*He is here./I am here./You are here.*). Moreover, in languages with rich verbal Inflection, Inflection may "stand for" the missing subject (*Este./Sunt./Eşti.*). In non-finite clauses, Inflection often determines the subject's case (and the position of the subject);for instance, the subject of the English gerund is a Genitive or an Accusative (e.g., (*It all depends) on their coming in time/on them coming in time*)); also, non-finite inflection often allows the subject to be absent. Since the category Inflection projects regularly, we may assume that the subject is the Specifier of Inflection (generated in SpecIP) as in (17a,b). Agreemnent between the subject and Inflection appears to be an instance of Specifier-Head agreement (see (19b)).

Through its structural relation with the VP and the subject NP, Inflection can rightly be viewed as the head of the sentence, which is now regarded as an inflectional projection (IP).

(17)   IP(=I'') → NPˆI'
        I' → I⁰ ˆVP

c) One more consideration is the relation of selection that holds between complementizers and Inflection. We have seen that the English FOR selects an infinitive inflection, the complementizer *that* always selects a finite (indicative/subjunctive) inflection a. s.o.:

(18)   I hope [꜀FOR[ᵢₚhim[ᵢₒTO[ᵥₚsucceed]]]]
        I hope [꜀ THAT[ᵢₚhe[ᵢₒ [ᵥₚ succeed in his attempt]]]]

Under the assumption that complementizers are subcategorized for particular types of clauses, we may express this relation as an instance of head-head selection between complementizers and inflectional heads, the latter being responsible for particular clausal structures. ·

To capitalize on our results so far, we have developed an interpretation of Inflection, which is supported by the descriptive facts mentioned, and which allows the analysis of *a sentence as a maximal projection (IP) that conforms to the principles of X-bar Theory*. The representation in (19b), based on the PSRs in (15 - 17), will replace that in (19a) from now on. A desirable notational simplification is that the irregular MV node in (19a) has disappeared in (19b).The analysis of sentences as inflectional projections will further be supported by the examination of other functional projections, as well as of the way that this conception about sentences interrelates with case-assignment and anaphoric processes.

(19)   a.   S

NP   VP

      Aux   MV

T   (M)   (have-en)(be-ing)   V'

b.   IP(I'')

NP   I'

        I⁰   VP

[± T, ± Agr] M   V'
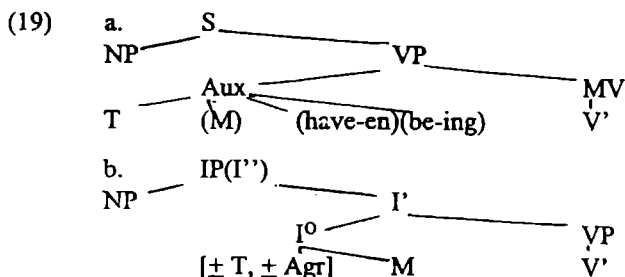
3.3. On the notion "auxiliary verb".

We have not so far given an account of the aspectual markers *have-en, be-ing*. The idea is to analyse *be* and *have* as *auxiliary verbs*, though not as constituents of Inflection. Auxiliaries differ from lexical verbs in that they have particular subcategorial and thematic properties, which might tentatively be defined as in (20).

(20) Auxiliaries are verbs subcategorized for a VP complement, which, however do not assign any θ -role.

The definition highlights two properties: a structural property, namely, that auxiliaries select a VP complement (their subcategorial feature is [+-- VP]), and a thematic property; auxiliaries have defective lexical structure, characterized by the absence of θ-structure. They cannot relate to arguments, except through another VP, which is their complement and on which they operate. Both properties indicate that auxiliaries have abstract meaning.

Individual auxiliaries select particular types of VP complements, *have* selects a Past Participle VP, *be* selects a Present Participle VP. The similarity between Inflection (affixes and modal verbs) and (aspectual) auxiliaries is obvious. Both subcategorize a VP complement and both are unable to assign θ -roles. Through their properties, auxiliary verbs are functional categories.
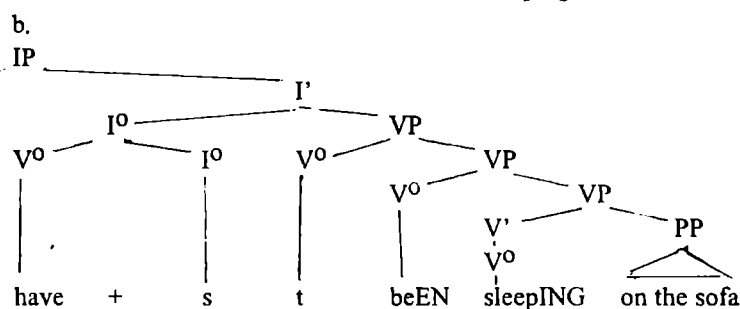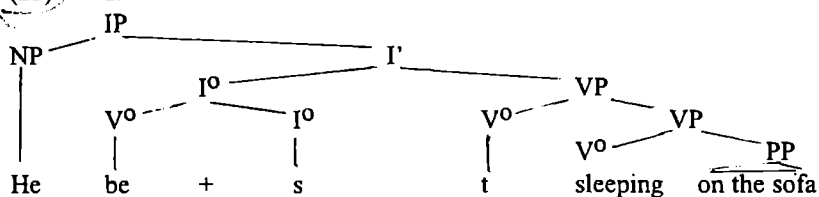
Consider the sentences in (21), which have the D-Structures (22a,b) and the S-Structures (23):

(21)   a. He is sleeping on the sofa.
       b. He has been sleeping on the sofa.

(22) · a.

```
                IP
        NP              I'
                I⁰          VP
                        V⁰      VP
                            V'      PP
                            V⁰
        He      s       be   sleepING   on the sofa
```
b.

```
            IP
        NP      I'
            I⁰      VP
                V⁰      VP
                    V⁰      VP
                        V'      PP
        He  s   have  beEN  sleeping   on the sofa
```

(23) a.

```
        IP
    NP                              I'
        I⁰                                  VP
        V⁰      I⁰              V⁰      VP
                                    V⁰      PP
    He  be  +   s           t   sleeping  on the sofa
```
b.
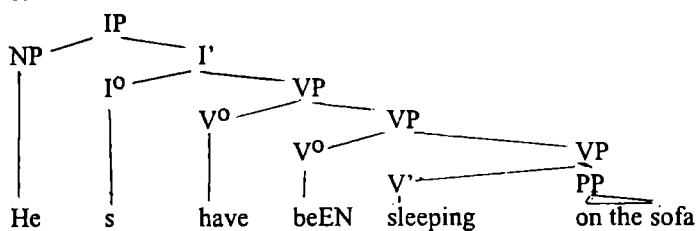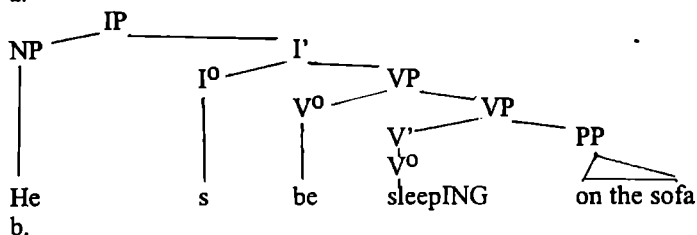
```
        IP
    NP                              I'
        I⁰                      VP
        V⁰      I⁰      V⁰      VP
                            V⁰      VP
                                V'      PP
                                V⁰
    He  have  +  s   t   beEN  sleepING  on the sofa
```

The following remarks are in order here: a) Inflection -s is an affix which cannot remain stranded, this is why the nearest auxiliary raises to Inflection. b) The raised auxiliary *adjoins* to I⁰, creating an adjunction structure dominated by I⁰ $[_I, V° + I°]$. The auxiliary verb leaves a trace behind, when it raises. The trace should be

properly governed to satisfy the Empty Category Principle (=ECP, see index). c) Raising of the auxiliary V^O to I^O involves the movement and adjunction of one head to another. It is generally the case that X^O constituents, as different from XPs (i.e., heads as different form phrases) move to an *immediately higher head position*, that is, a head moves to a head position which governs the first, so that the trace left behind is properly governed.

Unlike auxiliaries, English lexical verbs are not allowed to move to Inflection; therefore, if no modal is generated under I^O, the inflectional affix *-s/-ed* is lowered and adjoined to the lexical verb, in an adjunction structure dominated by V^O. The rule that lowers the inflection is Affix Movement, illustrated in (24b, c).

(24) a. He opened the window.

b.

```
          IP
     ____/  \____
   NP             I'
   |        ___/    \___
   |      I°             VP
   |      |              V'
   |      |        ___/    \___
   |      |      V°             NP
   |      |      |              |
   He     ed    open        the window
```

c.

```
          IP
     ____/  _____
   NP                 I'
   |          ___/        \_____
   |        I°                   VP
   |        |                    V'
   |        |              ___/    \___
   |        |            V°             NP
   |        |       __/    \__          |
   |        |     V°          I°        |
   |        |     |           |         |
   He       t     open   +    ed     the window
```
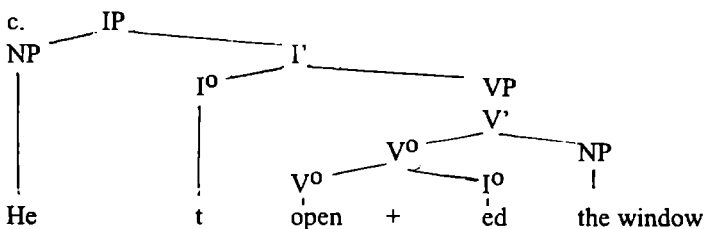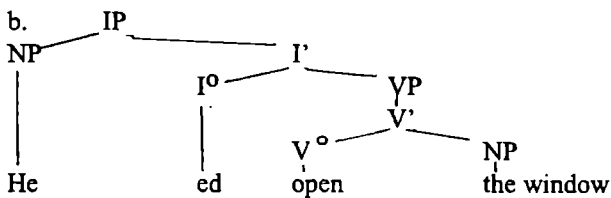
There is a potential problem created by Affix Movement, because it is a lowering rule. The trace left behind is not c-commanded; on the contrary, it c-commands the antecedent. The chain (t, ed) is thus improper, and the trace is not properly governed.

As already mentioned, the ECP *must* be met at the level of LF and *may* be met earlier. Since sentence (24a), whose S-structure is (24c), is well-formed, something must be happening between S-Structure and LF, so that the LF of (24c) observes the ECP. In principle, two kinds of things can happen: a) It may be that the offensive trace is deleted, because it is not required for semantic interpretation, and its presence does not follow from some other general principle of the grammar that has to be observed at LF, such as, say, the Projection Principle. b) Alternatively, it may be that at LF, the *inflected verb* $[V^O + I^O]_{V_O}$ goes back to the Inflection position, where it is needed precisely for reasons of semantic interpretation, having to do with interpretative scope. The inflected verb is an operator on the VP and should c-command the VP. The trace left behind by the LF movement of the inflected verb will then be properly governed. It will be seen that the second is the appropriate solution for the problem at hand.

In 3.2. - 3.3., we have thus sketched the current analysis of finite Inflection in English.
3.4. The significance of the analysis we presented, and the fact that it represents a considerable improvement over the earlier analyses, can only be understood in the context of comparative syntax and UG. A first illustration involves a comparison of English and French. As known, both are SVO languages, for the purpose of our discussion we need to mention that in both languages there is a class of adverbs that may or must occur VP initially; ie., they are adjoined to the VP in D-Structure; such adverbs are in English *often, almost, seldom*, etc., and in French: *souvent, presque, rarement* (see examples (25-26) and PM (26)). Secondly, in both languages, the VP ¬initial position is shared by some quantifiers, which refer to the subject, but may appear at a distance from it; these are the so-called floating quantifiers, e.g., F. *tous*, E. *all, both* (examples (27), PM (26)).

Proceeding to examine the behaviour of auxiliary and lexical verbs in English and French, the first obvious statement has to do with the similarity the two languages exhibit in the syntax of the auxiliary verbs: E. *have/be*, F. *avoir/être*:

(25)   a.   F.   J'ai presque oublié son nom.
          b.   E.   I have almost forgotten his name.
          c.   F.   *J'ai oublié son nom presque.
          d.   E.   *I have forgotten his name almost.

(26)   F.   Ils sont rarement sortis seuls.
            E.   They have seldom gone out alone.

(27)   F.   Ils ont tous compris la verité.
            E.   They have all understood the truth.

(28)
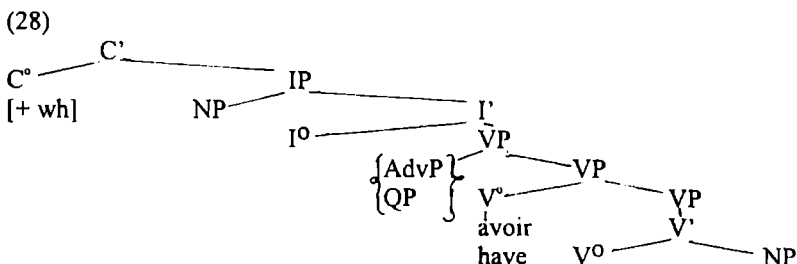
The contrasts (25 a-c) and (25 b-d) show that these adverbs should be VP initial (not VP final) in both languages. Assuming that *avoir/have* subcategorize for VP, the auxiliaries are generated above the (circled) VP, which explains the word order in (25-28). In both languages, auxiliaries raise to I⁰.

While the auxiliaries behave in likewise fashion, the syntax of lexical verbs sharply contrasts in the two languages.

(29)   F.   Jean embrasse souvent Marie.
        E.   *John kisses often Mary.
            John often kisses Mary.

(30) F. Mes amis aiment tous Marie.
     E. *My friends love all Mary.
     F. *Mes amis tous aiment Marie.
     E. My friends all love Mary.

(31)
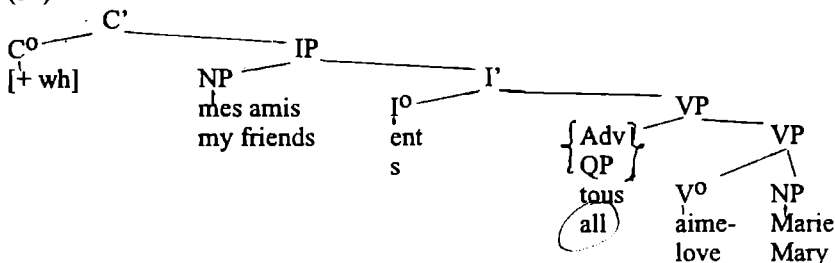
Consider (29) and (30). In all the French examples, the main verb moves up to Inflection past the adverb or quantifier (see (31)). V Movement is a *general process* in French, affecting *all* verbs, auxiliary or lexical. In contrast, in English, lexical verbs do not leave their D-Structure position; Inflection is lowered by Affix Movement.

It should be remarked that what once appeared to be a very limited quirky rule of English, namely the rule of *Have Be* Raising affecting just two verbs in English, proved to be a very general process, affecting *all* the verbs in French. V Movement in French is a case of Move α applied to heads, i.e., it is a case of Move α^0 which, obeys the Head-to-Head Movement Constraint (cf. Travis (1984)) discussed above; a head moves into the position of the first head above it, so that the trace left behind by movement should be properly governed. Head Movement is a local movement from one head position to the next, and possibly further up.

Thus, the inflected verbs in I^0 may further move into a position of a head that governs I^0, and this is the complementizer position C^0. As known, the IP is the complement of C^0, see PM (28,31). This movement is usually called the Infl-to-Comp rule, while the movement of a verb from VP to Inflection is known as V-to-Infl. The Infl-to-Comp movement is obligatory in certain types of sentences, e.g., in questions, where the C^0 node is specified as [+ wh], and this feature "forces" movements for semantic reasons.

English and French contrast again, very systematically, regarding the domain of Infl-to-Comp. In English, only auxiliaries that reach I^0 (the modals, *have, be, do*) can further raise to C^0. In French, all the verbs may move to C^0, and must do so in certain types of sentences; here are a few relevant examples showing the similarity of the auxiliaries (32) and the dissimilarity of the lexical verbs (33).

(32) F. Ils ont reussi.
     E. They have succeeded.

F. Ont-ils reussi?
E. Have they succeeded?

(33) F. a.Ils aiment tous Marie.
     E. b.They all love Mary.
     F. c.Aiment-ils tous Marie?
     E. d.*Love they all Mary?
       e.Do they all love Mary?

The chain which is formed as the lexical verb in French moves from its V^O, underlying position, to I^O and hence, to C^O is well-formed, since each higher position governs the preceding lower one. Examine now the English example (33a, 34b)

(34) a.

b.
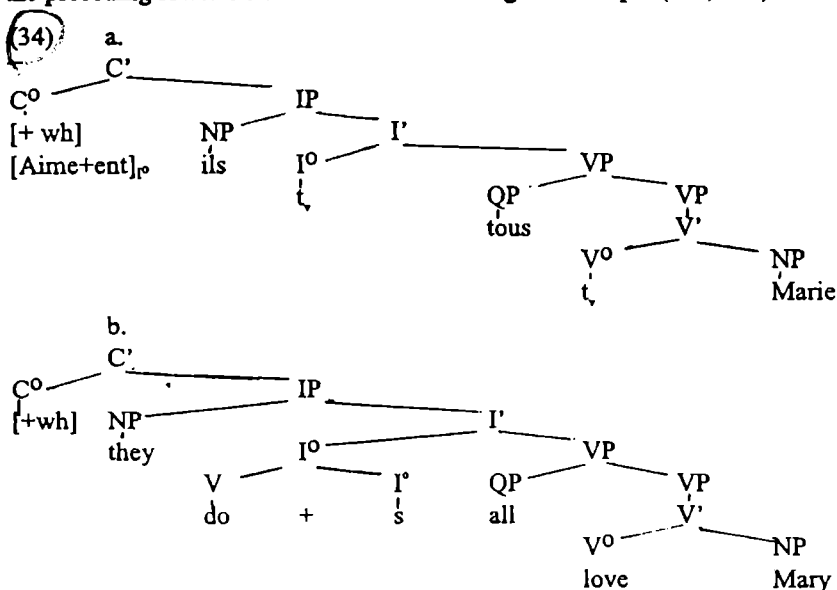
Movement of the finite inflection, and, therefore, of a finite verb to C^O is obligatory, because it is triggered by the [+ wh -] feature of the complementizer. The lexical verb *love* cannot move to I^O, and it certainly could not move to C^O in one step (cf. (33d)), because the C^O position does not govern V'', and the HMC would be violated. The only way to rescue D-Structure (31) is to resort to a language specific rule of DO-Insertion, which adjoins the auxiliary DO to Inflection, so that the inflected auxiliary can then raise to C^O (see (33e=34b)).

An interesting comparative question is to what extent there is a principled explanation for the contrast between English and French. Pollock (1988) conjectures that the relevant parameter is the relative 'strength' of the Inflection, in fact, of its Agreement features, where 'strength' of the Inflection is related to the morphological

richness of Inflection. The explanation has to do with the verb's ability to θ-mark its arguments from a certain syntactic position. Strong Inflection is capable to *identify* a verb, in the sense that a (strongly) inflected verb has all the properties normally associated with lexical verbs (cf. Roberts, 1991). (This is an instance of morphologic identification.) In particular, the inflected verb can θ-mark its arguments from the Inflection position where it has raised. In contrast, weak Inflection cannot identify a verb. The verb is alternativelty identified through its being governed by an auxiliary (a syntactic element) in syntactic position.(This is a case of syntactic identification.) The lexical verb stays in place within the VP and it is in this position that it can assign its θ-role.

In French, there is "strong" Inflection; the inflectional affix is subcategorized for a verb and forces the raising of the verb to Inflection. As explained, the inflected verb can θ-mark its arguments from the higher Inflection position. In contrast, in English, I° is weak and the movement of the verb to Inflection is blocked, since, as explained, θ-marking is only allowed when the verb is in its VP position. This is why lexical verbs raise to I° in French, but do not do so in English. If this hypothesis is correct, it is at once understandable why the auxiliarie *be/have* , which do not have to assign any θ-roles, are not subject to this constraint and may raise to I°. This variation in the properties of Inflection across languages has come to be known as the *Agreement parameter.*

3.5. If the contrast between English and French discussed above has to do with the richness of Inflection parameter, then, we expect Romanian, a language with a rich verb morphology, to pattern like French, not like English, and this is indeed the case. The auxiliary system of Romanian is more irregular, in the sense that auxiliaries exhibit different morpho-syntactic properties from their English and French counterpart (see Dobrovie Sorin (1993), Avram (1994), Isac (1994) for excellent relevant discussions), but the synthetic tense forms behave as expected. On the assumption that certain adverbs and floating quantifiers are generated in VP initial position, the word order observed in sentences (35) indicates that there is V Movement to I and C° in Romanian.

(35)   a. Ion știe bine răspunsul la întrebări.
         b. Cei despre care vorbim cunosc toți acest principiu.
         c.
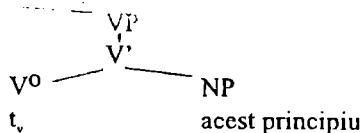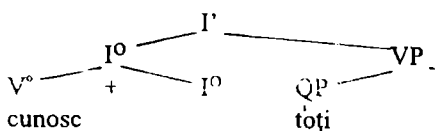
3.6. Concluding on Inflection. Our discussion of Inflection, basically aimed at explaining, by means of an example, the concept of *functional category*, since we asserted that the parts of speech system of any language include functional, in addition, to lexical categories. Let us review these features of Inflection that make of it a prototypical functional category:

a) The members of the category Inflection form a *closed set* (the feature +Tense, ±Agr with the formatives that realize them, and also the modals (in English)).

b) Members of Inflection do not occur alone. Inflection needs an obligatory unique complement (the VP) which is not an argument, since it is not θ-marked.

c) Semantically, Inflection lacks descriptive content, it merely "passes on" the descriptive content of its complement. The semantic contribution of a functional category is that of an operator, actualizing the reference of the VP, by "placing" it in time, in some world.

and there is agreement between them (i.e., subject-predicate phrase agreement). d) Inflection behaves regularly with respect to X' principles; it reguarly projects two levels of structure; one property that differentiates functional from lexical categories is that functional categories do not permit recursion on X'; there is one complement and one specifier, licensed by agreement. Thus, the specifier of Inflection is the Subject in English

4. Lexical categories. Verbs.

In this section, we once more examine problems in the theory of parts of speech, emphasizing the relation between the categorial description and the thematic properties of the major parts of speech. We then examine the central functional categories: Inflection, Complementizer, Determiner. The opposition between lexical and grammatical parts of speech has often correctly been described as an opposition between *open* and *closed* classes of items. The open classes included the noun, the verb, the adjective and the adverb. They were defined as: a) classes which contained indefinitely many items (running into tens of thousounds); b) classes where conscious coining, borrowing, etc. are allowed, i.e., classes where new items can be added.

Of late, stress has been laid on the thematic and argumental properties of open categories. As already mentioned, open categories are categorially describable in terms of the features ± N, ± V. Reuland (1986) proposes to interpret these features as follows:

[+N] -an item's capacity to carry person, gender, number and case features (the so-called φ features) and to be licensed as an argument.

[+V] -an item's capacity to license an argument and assign if a θ-role.

Moreover, in Reuland's description, each feature α is three-valued + / 0 / - . This allows for a more delicate description than presented above. The three values have the following significance:

The value [-α] of a feature signals impossibility for an item to occur in a certain combination; e.g., finite verbs are never licensed as arguments.

The value [+α] signals that all the items of a class are open to a certain property, to a certain mode of construction, without lexical idiosyncratic variation.

The value [0α] shows that if all syntactic requirements for licensing along the feature α are satisfied, some (or all) members of category C will have property α .For instance, nouns do not always have to assign θ-roles. In a sentence like *This/the assignment is to be avoided, assignment* does not θ-mark any NP, in spite of its being derived from the transitive verb *assign*. In contrast, when it has a complement, as it does in: *The constant assignment of unsolvable problems is to be avoided*, the nominalization *assignment* marks its complement *unsolvable problems* as Theme. Therefore, nouns may be described as [0V] rather than [-V], to show that *some* of them *may* function like verbs in appropriate syntactico-semantic contexts.

4.1. <u>Verbs</u> present the most clear-cut categorial case: they are never argumental, they are [+V, -N]. Verbs express relations and their relational nature is overt, since they externalize at least one argument. In this respect, verbs differ from adjectives and nouns. Thus, from a strict referential semantic perspective, we may say that [*live*]$_V$, [*round*]$_A$ and [*horse*]$_N$ are alike, since they all denote sets: the set of individuals that live, the set of objects which are round, the set of individuals which are horses; using the λ-operator to indicate class formation, we may represent these meanings as λx (sleep(x), λx (round (x)) and λx(horse (x)); yet, syntactically, we say *He lives*, but not *It rounds* or *It horses*. Thus, since it expresses a predicative content, the noun *horse* has an (internal or structural) variable in its LCS, but it does not have to make of it a syntactic argument.

4.2. We are now in a position to say more things about the thematic structure of verbs. In the preceding chapter, we described the verb's θ-structure as a hierarchical representation of the arguments of the verb. When a sentence is projected, each θ-role is discharged by θ -*marking*, i.e., by coindexing it with an argument position of the verb.

When all the open positions in the θ-grid have been discharged by coindexation with argument positions, the verb's θ-grid has been saturated. θ-marking observes the following configurational requirement.
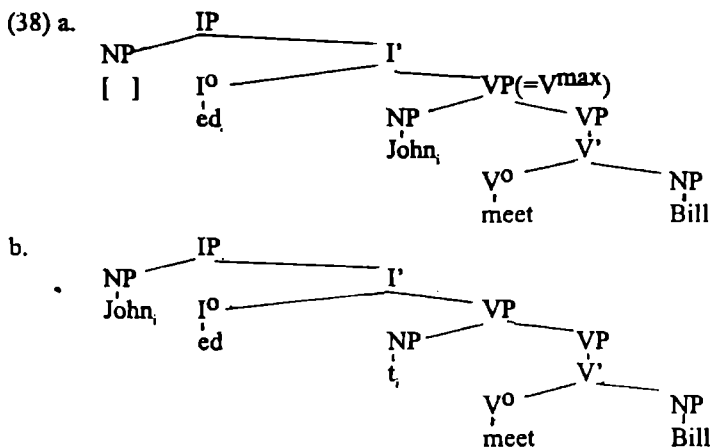
(36) θ-marking should take place under government by the θ-marking head, therefore, within some projection of the head.

Consider the representation of an ordinary transitive sentence, *John met Bill*. The DO object is directly θ-marked (and θ-governed) by V⁰, so condition (36) is satisfied. The subject, in fact, the [NP, IP] position is not inside a V projection, and there is one projection, the I', between the θ-assigner and its subject argument. The position of the subject is SpecIP. In the presentation of the role of Inflection in the sentence, it was seen that the [NP, IP] position is chiefly a *case* position; the

Nominative case is assigned to the subject in English, in the [NP, IP] position, through a mechanism of Specifier-Head agreement.

(37)

```
              IP
        _____|_____
       NP            I'
       |        _____|_____
      John     I⁰          VP
               |        ____|____
              ed        V'
                    ____|____
                   V⁰        NP
                   |         |
                  meet      Bill
```
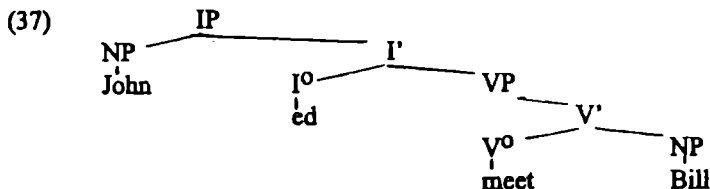
But then, one may just as well assume that the subject is generated in a VP internal position, adjoined to VP (or to V'), and that it moves to the [NP, IP] position, in order to get case. The D-Structure of *John met Bill* might be as indicated in (38a). The [NP, VP] or Specifier of VP position is a θ-position, i.e., an argument position.

(38) a.

```
              IP
        _____|_____
       NP            I'
       |        _____|_____
      [ ]      I⁰                  VP(=Vᵐᵃˣ)
               |          _____|_____
              ed         NP                  VP
                         |                   |
                       John_i               V'
                                        _____|_____
                                       V⁰          NP
                                       |           |
                                      meet        Bill
```

b.

```
              IP
        _____|_____
       NP            I'
       |        _____|_____
     John_i    I⁰                  VP
               |          _____|_____
              ed         NP                  VP
                         |                   |
                        t_i                  V'
                                        _____|_____
                                       V⁰          NP
                                       |           |
                                      meet        Bill
```

The hypothesis that subjects are projected inside VPs (in D-Structure) is known as the "internal subject hypothesis" .

The desirable theoretical result is that now both the subject and the object are uniformly generated, and θ-marked inside projections of the verb under government. We are thus provided with some "syntactic basis for the traditional semantic notion of the predicate-argument relation" (cf. Speas(1991)). Condition (36) on θ-marking is now satisfied.

The internal subject hypothesis has many desirable descriptive consequences. For instance, it allows one to differentiate between languages like English, where the specifier V' (or [NP, VP]) position is a θ-position, but not a Case position, so that the subject has to move to the preverbal [NP, IP] position to get case (as in (38b), and languages like Romanian, where the Nominative can be assigned in post verbal position and the subject may retain its VP internal position; (see (39)), which is the S-Structure of *A cumpărat Maria prăjiturile*).

(39)

```
            IP
 I⁰  ⎯⎯⎯⎯                ⎯⎯⎯⎯ Vᵐᵃˣ
cumpără    NP ⎯⎯⎯              VP
           Maria                 ⎯⎯ V'
                            V⁰ ⎯⎯⎯⎯ NP
                            t       prăjiturile
```
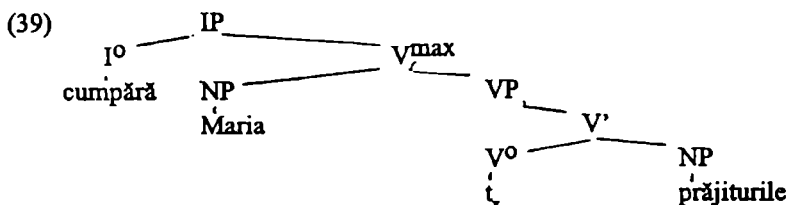
In languages like Romanian, the [NP, V^{max}] position is not only a θ-position, but also a case position.

4.3. The a-structure of a verb will thus be responsible for projecting all of the predicate's arguments.

But the verb also takes adverbial modifiers which may be in the VP, even if they are not in the first projection; adverbial modifiers, too, should be licensed by some relation with the verbal head. At the same time, the verb must relate with Inflection whose complement it is. Verbs (and VPs) do not bear θ -roles, and the relation that licenses the [I⁰ VP] , structure is not θ-marking.

A currently adopted solution to these problems has been to enrich the verbs' θ-structure and claim that it consists of both an *event structure* and an *argument structure*; this amounts to saying that the verb's θ-grid includes an event variable [=e], in addition to the argument variables. The θ -structure of a verb like *hit* will be represented as ((Agent (Theme)) e) or ((x (y)) e) or <1, 2, e>, choice of notation being irrelevant.

The systematic, theory-loaded use of an event variable e in generative semantic analysis is due to James Higginbotham, in a series of important papers (1983, 1985, 1989). In his turn, Higginbotham was influenced by the theory of events developed by the important American philosopher Donald Davidson (1966, 1980). Davidson's work was also a major influence on semantic analysts in the logico-philosophic tradition (e.g., Dowty, 1991), with the result that event analysis, with its many ramifications into ontology, reference, aspect, etc., has become a major theme in contemporary semantics (see Parsons (1992)). In fact, the centrality of event analysis in linguistics must already have become apparent in the discussion of aspect. The aspectual classification of verbs was a classification of event types. Among other things, it was shown that complex events, i.e., accomplishments may have other events as their components. An accomplishment is a causal structure of type [e₁ causes e₂], where the first event e₁ is a causing activity, and the second event e₂ is the resulting change of state. We have equally seen that the event structure of predicates also determines certain prominence relations among the participants in the event, setting aside a Cause role, as the most prominent in the aspectual tier (see also chapter 6).

Davidson's seminal paper (1966) represented an attempt to construct a referential semantic analysis of 'action sentences'. In his view, action sentences are

statements about events. Davidson originally proposed that verbs have an event variable among their arguments, in order to give a straightforward account of the *semantic contribution of instrumental* and other modifying adjuncts, which he interprets as *modifications of an event*:

(40) Jones buttered the toast in the bedroom with a knife at midnight.

In this sentence, which is Davidson's example, the three propositional phrases modify not the verb *butter*, but the event of "toast-buttering by Jones". Higginbotham (1985) proposes that the event variable is part of the thematic structure of verbs; moreover, in Higginbotham's view all lexical parts of speech Vs, As, Ps, Ns have (or may have) θ-grids, and all include both argument variables and an event variable in their thematic structure. His examples are those in (41):

(41) V: hit [+V, N]   <1, 2, e>
      A: happy [+V, +N]   <1, e>
      P   in [-V, -N]   <1, 2, e>
      N: book [-V, +N]   <1>
            destruction [-V, +N] <1, 2, e>

This generalization of θ-grids to all lexical categories contributes to Higginbotham's overall research project, in that it allows him to suggest a systematic approach to the problem of deducing the principles of interpretation for complex syntactic structures from the categorial interpretation of words. Each head X^0 has a θ-grid that percolates to the higher projections X', XP. Complex expressions (combinations of phrases) receive their interpretation through the application of a restricted set of operations which result in the *discharge of the positions in the θ-grid*. Discharge is as we know the "elimination of open thematic positions in lexical items and in complex phrases" (Higginbotham,1985: 14). We have already studied one such operation, namely *θ-marking*, corresponding to the *predicate-argument relation*. We are in a position to briefly describe other modes of discharge, which correspond to other semantic relations (modification, specification) and, thus, to other modes of syntactic (phrase structure) realization.

4.4. The arguments for the existence of this event position in the θ-grid are primarily semantic; at this point, we are first of all interested in the fact that certain sentence constituents, such as *adverbial modifiers* and *predicative adjuncts*, connect to the rest of the sentence, by implicit reference to the event designated by the rest of the sentence (the verb and the arguments).

Let us examine adverbial modifiers like *slowly, certainly, surely* and let us accept that they have an event position in their θ-grids. *Surely, quickly*, etc. are entered in the lexicon as *certainly <e>, quickly <e>*. The idea we want to capture is that adverbials characterize the whole event (what is denoted by the verb plus its

arguments) and that this is done by *identifying* the event position in the adverb's θ-grid with the event variable in the verb's θ-grid. Consider the following examples:

(42) a. John left the room.
      b. John certainly left the room.
      c. John certainly left the room earlier.
      d. certainly <e>   leave <1, 2, e> or ((Agent (Source)) e)

Leaving the adverb out of consideration, sentence (42a) asserts that an event characterized as a leaving, occurred with John and the room as participants (respectively cast in the roles of Agent and Source). In (42b) the adverb adds a property of the event, characterizing the event of John's leaving the room as certain. Generally, in a modification structure of the type [V' + AvP]$_{V'}$ also illustrated in (43), *the event variable in the adverb's grid is identified with the event variable of the head-verb and also of the head-verb projection.*   ,

(43)
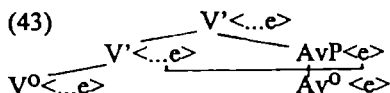
We say that the event variable in the adverb's grid is *discharged through θ-identification*; θ-identification obeys the *sisterhood condition*; the AvP, whose open event position is discharged through identification, is *governed* by the verb projection. Notice that the resulting structure in (43) still has an open *e* position because modifiers can be added at will. In (44) we have illustrated both θ-marking and θ-identification in a representation of sentence (42c).

(44)
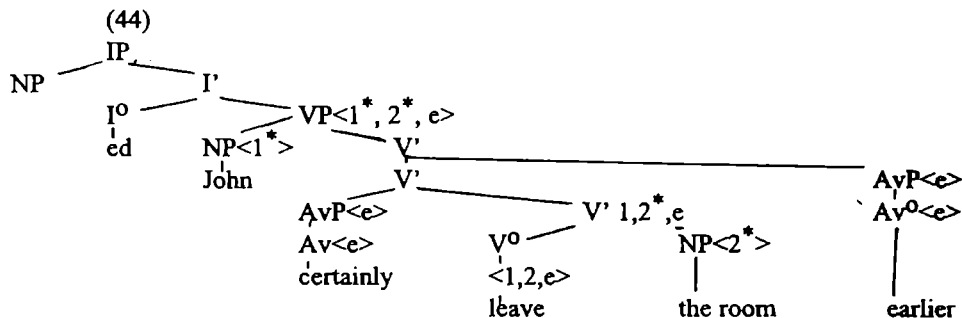
θ-identification, the merging of two predicates which refer to the same entity, emerges as the characteristic *means of licensing a modifier*. Merger of two predicates by θ-identification of their variables is, however, only the most straightforward case. As shown by Hegarty (1992: 217),.there are a variety of adverbial modifiers, and for many of them, straight θ-identification is not sufficient as a theory of their construal. This is true for modifiers such as *allegedly*, for rationale clauses, as in *John went to the library*

in order to prepare for the exam ,and for argument-oriented adverbs, such as *intentionally* and *reluctantly*. These all have peculiarities in their interpretation, which are not captured by θ-identification of event positions alone. Nevertheless, all of them qualifiy the event or the participants in the event, in some way. In particular, any adverbial modification will involve some relation or other to the event position of the clause (i.e., to the event designated by the verb in the clause), subject to the same locality restriction as θ-identification (namely, sisterhood of the adverbial with a node to which a θ-grid bearing the event position has been projected).(see(43)).Similar problems of semantic interpretation arise in the study of nominal modifiers.

A second example of a constituent licensed by θ-identification is the adjunct predicate, a secondary predicate in sentences like (45) (see Rappaport (1991)).

(45)   a. ·   John left the room [angry]$_{AP}$
       b.   He ate the meat [raw]$_{AP}$.
       c.   He sold the tuxedos [used].

These sentences contain underlined APs that qualify as adjunct-predicates (predicative adjuncts) or secondary predicates.(In alternative analyses, the adjunct is viewed as a clause; this distinction does not affect our discussion at this point.) The predicate adjunct construction has the following properties: a) The adjunct predicate refers to an argument of the main verb, the subject in (45a), the DO in (45b, c); this *host* argument is also understood as the subject of the predicate adjunct, so that a secondary predication relation holds, in addition to the predication expressed by the main verb. b) Secondly, the host argument is θ-marked by the main verb in the canonical θ-marking configuration, and also by the secondary predicate. c)Thirdly, the adjunct predicate is not *selected or subcategorized* by the main verb, rather it separately describes the one entity that undergoes the verb's action *at the time of that action*. 'He ate the meat, while the meat was raw' (these constructions should not be mixed up with the deceptively similar causative-resultative ones, of type : *He painted the wall white*).

Taking these features into account, we may attribute to (45b) an underlying structure like (46):

(46)

direct θ-marking   θ-marking
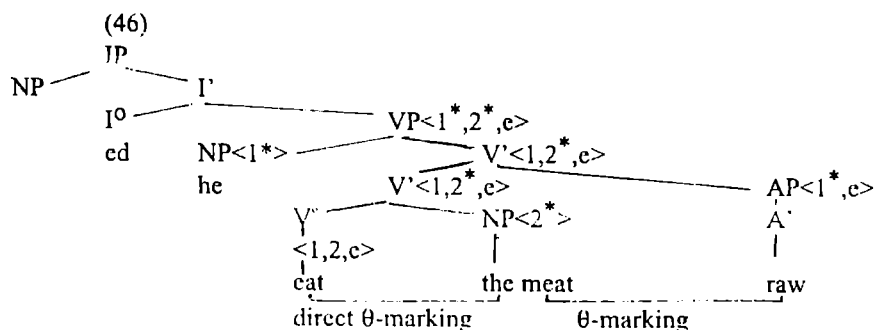
Since the secondary predicate is not subcategorized or selected by the main verb, it can only relate to the verb through θ-identification of the adjective's event variable with the verb's event variable, with the result that both predicates describe aspects of the same event. The secondary predicate actually refers to a participant in the event, what we called the host argument. θ-identification licenses the AP in the appropriate phrase structure configuration; the AP is a sister to the V' projection that licenses it (and governs it). At the same time, the host argument (the DO) qualifies as the subject of the secondary predicate AP, since the two nodes are in an appropriate command configuration. As shown by Rothstein (1983), Williams (1980), subjects should m-command and be m-commanded by the predicates.

Our results so far, lead to the following conclusions: a) θ-identification is the semantic correlate (in fact, one of the semantic correlates) of the relation of modification. In its turn, modification presupposes a certain syntactic configuration between two phrases, the modifier XP and the modifee, X'; the syntactic configuration, namely, government of the modifier by the modifee, was described in the projection clause for the modifier relation (see chapter 5. above). b) The event variable in the θ-grid of lexical categories is involved in licensing non-argument verb dependent categories (adverbials, secondary-predicates).

4.1.4. It will shortly be seen that the event variable is also involved in relating the Inflection with the verb. Perhaps a final remark is needed at this point: the event variable differs from the argument variables, in a fundamental way. This variable is *not projected* as an independent syntactic position and also it is not saturated by combination with modifiers. One might object that this position is superfluous, belonging more appropriately in the LCS of the verb. An excellent answer to this objection is provided by Speas (1991: 63) which we are quoting in full: "Such an objection would misconstrue the status of the θ-grid; supposing it to be no more than a modified subcategorization frame. In the modular licensing theory, [. ....], the θ-grid is the object which determines how the complete lexical entry will be related to the syntactic structure. If we think of the LCS as a semantic elucidation (of the word's meaning), and of the thematic grid as the structural part of the verb's meaning, it seems clear that if a lexical item names a certain event, which has, say, two participants, then the structure which will correspond to this lexical item will include the realization of two arguments *and* a realization of the event itself. *The verb itself does not suffice to realize the event syntactically, but by including an event position in the θ -grid, we achieve the result that the observed modifications and binding of the event can be formalized.*" (emphasis mine A.C.).

5. Nouns.

As expected, the unity of the noun class obtains at the formal level and it is conferred by the morpho-syntactic feature of case-gender and number, which (in that order) are common to all nouns without exception. A second exceptionless property is that all NPs may function as arguments and as bearers of θ-roles. It has also been

argued that there is one syntactic function that only NPs, as opposed to complement clauses, can have, namely, the *subject* function (cf Koster(1978), Emonds(1985)).The properties listed so far derive from, or manifest, the categorial property [+N], giving the essence of nominality.

From the point of view of their thematic and predicative properties, nouns (and we are strictly speaking of nouns, not NPs now) are more heterogeneous.

Let us first examine prototypical common countable nouns: *boy, table*, etc. Common nouns refer to sets;a noun like 'boy' may be said to have as referent the set of boys, while 'table' has as referent the set of tables. In fact, it may be more accurate to say that the noun denotes some property 'being a boy' or 'being a table', which picks out the set of entities satisfying that property in some world; therefor, *boy* refers to the 'set of individuals who are boys'; *table* refers to the set of entities which are tables; using the operator λ(lambda) to indicate set formation, one can say that 'boy' denotes λx [boy(x)] and 'table' denotes λx [table(x)]. The noun implicitly contains a *formal variable*, which is not θ-marked. This open variable in *boy*(x), *table*(x) must be bound by a *quantifier*. It is the function of *determiners and quantifiers to bind this internal variable*. Binding turns the unsaturated nominal expression into a *saturated* expression which can be used as an *argument*. Compare *I saw boy, I saw several boys, several* is an operator on the set of boys in this example, showing how many items of the set are referred to: [*several x (boy(x))*]. (In Higginbotham's notation, the fact that *several boys* is a saturated expression that had one open position x, is indicated by a starred x, a notation that we have already used: *several boys*$<x^*>$ or *several boys*$<1^*>$).

A different question is to what extent nouns can act as θ-markers; to what extent it is desirable to argue that they have argument structures and that they license and θ-mark arguments like verbs. This difficult question has been and is a matter of intense research (a few significant contributions might be Chomsky (1971), Giorgi and Longobardi (1991), Zubizaretta (1986), Szabolcsi (1991), Valois(1991) a.o..

An interesting balanced and rather sophisticated answer to this question is the one put forth by Grimshaw (1990), which we will try to sketch here. The difficulty of the problem is that, on the one hand, *there is* a compelling similarity between verbs and those nouns which are lexical or morphological cognates of verbs. Related nouns and verbs share the same prepositions, the same subcategorial and selectional properties. And this is a regularity which should be accounted for:

(47)   John depended on his aunt.
        John's dependence on his aunt
        He attempted to murder her.
        His attempt to murder her
        They destroyed the city.
        Their destruction of the city
        The city was destroyed by the barbarians.
        The city's destruction by the barbarians

On the other hand, while verbs *require* the presence of their arguments (the objects and the subject), nouns do not do so. Nominalizations of transitive or prepositional verbs may go not only without a "subject", but also without their "object", and this tendency to "argumentlessness" of the nouns is also a fact that requires an explanation (cf. Ross (1977)).

(48)   a.They anounced the destruction of the city.
     *They anounced that destroyed the city.
     b.It was painful to watch this destruction.
     **It was painful to watch (how) destroyed.
     c He had come to hate his dependence.
     *He hated the fact that he depended.

Grimshaw's solution is to distinguish between two kinds of verb-related nouns: first, there are nouns that designate *complex events* or processes (*the destroying of the city, the examination of the student by the teacher*); secondly, there are deverbal nouns that designate *results* (or other effects or concomitants) of processes (*the exam, the expression* (*on her face*) (*They are here to assess the destruction*). Of course, most deverbal nouns have both uses, and this ambiguity, which had been detected and documented for quite some time, makes the data more difficult to interpret.

In the framework she is using (the one we have developed here), Grimshaw is able to relate the difference between complex event nouns and result nouns to different lexical representations in the lexicon for these types of nouns. The proposal is that *only nouns that designate complex events have aspectual event structure*, and only these nouns have *argument structure*; consequently, only these nouns *require arguments* and θ-*mark them* (*The felling of the oak tree was necessary* vs *The felling was necessary; the destruction of the city by the enemy* vs *the destruction by the enemy*). Result nouns have LCSs but lack a-structures; they license accompanying PPs, on the basis of their LCS and on the basis of the context.

5.1. Let us illustrate the difference between nouns (or readings of nouns) that designate complex event and nouns (or readings of nouns) that denote results (the output of a process or an element (often metonymically) associated with the event/process). The hypothesis we are testing is that the former, but not the latter, have an a-structure, which is similar to the a-structure of the related verb. Like the a-structure of a verb, the a-structure of a complex event noun has to be satisfied, and the presence of the complement is *required* (subject to lexical variation, just as in case of verbs). The easiest cases are those of gerundive nominalizations (or -*ing* verbal nouns) which always designate processes; as in the case of the corresponding verb, the object argument is obligatory.

(49)   a.The felling of the trees
     b.*The felling

c.They felled the trees.
d.*They felled.

For the vast majority of nominals that are ambiguous between a complex event reading and a result reading, one way of forcing the complex event reading is by using aspectual modifiers like *constant/frequent*; in this case, the result reading is excluded; the presence of the object argument is obligatory.

(50)   a.The assignment is to be avoided.
        b.*The constant assignment is to be avoided.
        c.The constant assignment of unsolvable problems is to be avoided.
        d.*We constantly assign.
        e.We (constantly) assign unsolvable problems.

In (50a), there is a result nominal, which, of course, does not require (or indeed allow) an argument. The addition of *constant*, as in (50b), rules out the result reading, since *constant* cannot be construed as a modifier of *assignment* on its result reading, and forces the complex event reading of the noun. Hence, its a-structure must be satisfied, as in (50c), just as the a-structure of *assign* must be satisfied in (50d). A similar explanation may be given for the examples in (51):

(51)   a.The expression is desirable.
        b.*The frequent expression is desirable.
        c.The frequent expressions of one's feelings is desirable.
        d.*We express.
        e.*We (frequently) express.

It is aloso significant that result nominals may often pluralize and they may even require concrete meanings. *Constant/frequent* have other uses, found with plural result nominals, which are not associated with an event:

(51)   f.These/such constant assignments were avoided by the students.

Another way of teasing out the complex event reading is to use a Genitive with subject (Agent) role. The presence of the subject serves to disambiguate the nominal in the direction of the event reading, so that the presence of the object is also required. Consider the following group of examples.

(52)   a.The examination took a long time.
        b.(*) The instructor's examination took a long time.
        c.*The instructor's intentional/deliberate examination took a long   time.
        d.The instructior's examination of the papers took a long time.
        e.The instructor's deliberate/intentional examination of the papers
        took a   long time.

The result nominal *examination* in (52a) is perfectly well-formed with no *of* phrase. In (52b), there are two readings. The possessive may simply be understood as a 'possessor', a very general (adjunct) role whose precise interpretation depends on the wider context. The 'possessor' may be the one who is examined (*The instructor's examination by the board took a long time*) and, as pointed out by Grimshaw (1990: 51), "the interpretation of the possessive modifier *does not exclude* a reading in which the "possessor" was the instigator." However, even this would be an 'inferred' agentive reading. As evidence that this is so, note that if an Agent-oriented adjective like *intentional/deliberate* is included forcing a genuine Agentive interpretation of the Genitive NP, the phrase becomes clearly ungrammatical, as in (52c), unless the argument structure of *examination* is satisfied, expressing both the Agent and the Theme [Patient], as in (52d, e). The pattern is very systematic, as can be seen by perusing the examples in (53) or (54); examples (53b), (54b) are ill-formed, if the Genitive is read as an Agent ;((53b) might be fine if the Genitive is read as a Theme).

(53)   a.   The development was applauded.
         b.   (*)The city's development was applauded.
         c.   The city's development of inexpensive housing was applauded.
         d.   (*)The city developed.
            The city developed inexpensive housing.

(54)   a.   The destruction was awful to see.
         b.   *The enemy's destruction was awful to watch.
         c.   The enemy's destruction of the city was awful to watch.
         d.   *The enemy destroyed .
            The enemy destroyed the city.

Another important difference between result nominals and event nominals has to do with their determiner system. Result nominals are completely free in the use of determiners; they pluralize, they may develop concrete meanings in addition to the abstract one. (Here is an example involving *examination*; in its result, concrete sense, it has served as the basis for a clipping formation *exam*).

(55   a.The examination/exam was long/on the table.
        b.The examination of the patients took a long time
        *The examination was on the table.
        c.The exam was on the table.
        *The exam of the patients took a long time.

Complex event nominals can only take the definite article; they may also be used without a determiner; this can be seen in the examples below: when *assignment* designates a complex event, it occurs with the definite determiner or without a determiner.

(56)   a.They studied the/an/one assignment.
         b.The assignment of that problem too early in the course always causes problems.

c. All those assignments were too long.
d. *The assignments of the problems took a long time.
e. Assignment of difficult problems always causes problems.

An important difference related to determiner use is that process nominals do not occur predicatively, while result nominals do.

(57)   a. That was the/an assignment.
        b. *That was the/an assignment of the problem.

We conclude that even if the data are somewhat slippery, we may identify a class of nominals that designate complex events; these have a-structures that must be satisfied; that is, they define the class of cases where certain participants are arguments cast in *grammatical* roles and constrained by the rules of grammar to occur. In contrast, result nominals do not have an a-structure.

5.2. We have seen that nouns have an internal variable which is not projected as an argument, but is bound by a determiner. We could capitalize on the existence of this variable and assume that the internal variable of complex event nominals is the same kind of event variable that verbs have in their thematic structure. If we accept that, then the thematic structure of an event nominal like *the frequent observance of this custom by the native* may be; ((x (y)) e) or ((Agent (Theme)) e). We could adopt the convention of using *r* as the internal variable of *any* other type of nominal: *dog* (r), *exam* (r), etc. The e/r variables are those bound by determiners:

(58)   the r N(r)   (e.g., *the r boy (r)*)
        the e N((x (y) e) (e.g. *the e (natives' observance (of this custom)e)*)

The event variable signals that the noun has an internal semantic analysis, along the temporal/aspectual dimension. The event variable is "responsible" for licensing aspectual modifiers in complex event nominals, modifiers which are similar to those which occur with the corresponding verbs (e.g., *for NP* adverbials with activity verbs/nominalizations, *in NP* phrases with accomplishment verbs/nominalizations a.s.o).

(59)   a. The bombing destroyed the city in only two days/*for two days.
        (accomplishment)
        b. The total destruction of the city in only two days appalled everyone.
        c. *The total destruction of the city for two days appalled everyone.

(60)   a. They observed the patient for several weeks/*in several weeks.
        (activity)
        b. Only observation of the patient for several weeks can determine the most likely cure.
        c. *Only observation of the patient in several weeks can determine the most likely cure.

It is interesting that nominals that do not have argument structure disallow aspectual modifiers, even when they have verb-related meanings.

(61)   a.*The frequent trip/event was a nuisance.

(*frequent* and *constant* may occur only if the noun is pluralized: The frequent trips/events were a nuisance.)

b.*Jack's trip in five hours/for five hours was interesting.

c.*The process in five hours/for five hours was significant.

This restriction of occurrence is not a matter of 'meaning', since these nouns have a durative sense, as testified by sentences like: *That trip/event process took three weeks*; what they lack is temporal internal structure). The behaviour of aspectual adjuncts, licensed by the *event* variable, further confirms the dissimilarity of complex event nouns and result nominals, and the similarity of complex event nouns and verbs.

5.3. Even when they take arguments, nouns are defective θ-markers, i.e., they transmit the θ roles by means of prepositions. Prepositions are always capable to θ-mark an NP, in principle; but sometimes their meaning is so abstract, that they do not have any *specific* role to assign (the same is true about oblique case inflections); in such cases, they may transmit to their own argument a role in the a-structure of a noun or a verb.

The semantic process at work is again one of "θ-identification"; a position in one argument structure is linked to a position in a second argument structure, in such a way that both are satisfied by a single syntactic expression. For instance, in (62b) below the Goal argument y , in the a-structure of *presentation*(=62a*)* has been identified with the argument of *to*, and the Theme argument,z, has been identified with the argument of *of*.

(62)   a.   *presentation*: $((x \ (y \ (z)) \ e)$

        b.

```
                        N'
        N ┌─────────────┴─┬──────────────┐
        │            ┌───PP───┐      ┌───PP───┐
        │            P       NP     P        NP
presentation        of      books · to    the public
```
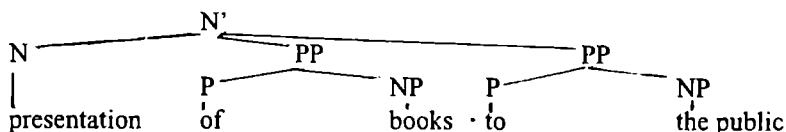
If the hypothesis that nouns cannot θ-mark ,except through prepositions (or oblique case inflections), is correct, then we expect that *in constructions where nouns are not followed by PPs, they cannot θ-mark a constituent*, and they do not designate complex events, either. One argument in support of this position comes from the behaviour of deverbal nouns like *announcement, conclusion, observation, belief, conviction*, etc., when they take *that*-complements:

(63)   a. The announcement/conclusion that an investigation has been initiated was inaccurate.

        b. Their observation that the position had been filled surprised everyone.

A remark that was made a long time ago by traditional grammarians is that nouns with sentential complements do not have the meaning of process nouns. Thus, the *announcement that p* seems to refer not to an event of announcing, but to an announcement of which the complement specifies the content. Similarly, the noun *observation* in (63b) refers not to the fact, event or process of observing, but to the content of the observation. The complement clause is interpreted like an apposition, not like an argument. These nouns may designate complex events, when their complements are prepositional phrases, PP, which may be θ-marked by means of the prepositions. The sentences below show some differences between the prepositional complement construction and the sentential complement construction of the same nouns. The former may designate events, and therefore allows aspectual modifiers and purpose clauses. The latter designates results of events/activities and does not have either of these properties:

(64) a. The constant announcement of inaccurate results should not be condoned.
b. The announcement of inaccurate results in order to impress the public is not condoned.

(65) a. *The constant announcement that results have been achieved should not   be condoned.
b. *The announcement that results have been achieved in order to impress the public is not condoned.

Notice also that, although the sentential complement is obligatory for verbs, it is optional for nouns, and this further supports that idea that nouns that take sentential complements do not have argument-structure, presumably because they fail to θ-mark the sentential complements in the absence of prepositions.

(66) a. The announcement/conclusion that inflation was rampant was   hardly   surprising.
b. *They announced/ they concluded.

Concluding on the thematic properties of nouns, we may say that: a) There is a class of nominals that have θ-structure (event structure and a-structure), whose behaviour resembles the behaviour of verbs; these verbs require certain arguments and license aspectual modifiers, purpose clauses, etc. b) Even these nouns cannot directly θ-mark arguments. Nouns are defective θ-markers which assign θ-roles through prepositions or oblique cases. c) This description follows from the categorial properties of nouns, if we assume that they are assigned the feature [+N,0V]. The value 0V of the +/0/-V feature shows taht only some nouns are θ-assigners in the appropriate syntactic environments.

5.4. Apart from this, however, all nouns (and result nouns in particular) license complements and modifiers selecting the appropriate prepositions and cases.

(67) a. John's gift to Bill / *John's book to the hospital
b. Yesterday's statement that the president intended to resign was greeted with scepticism.
c. his trip to California by bus

They can do so on the basis of their LCS (cf.Grimshaw (1990)). Complements are directly linked to variables in the LCS, modifiers are semantically compatible with the LCS. The difference between complement-taking by nouns generally and argument-taking by complex event nominals is that *the arguments must occur in a certain configuration*, so that what counts is the *co-presence of arguments* (which is indicative of the prominence relations defined by the θ-grid); as usual grammaticalization coincides with the emergence of structure and hierarchy. But the a-structure of complex event nominal is abstracted *away from the same LCS*; this is why the arguments and complements look alike, *being selected by the same head.*

A test for distinguishing between complements / arguments and modifiers is that only modifiers may occur in a predication relation across the copula.

(68)   a.   The book by/about/on Chomsky
                 The book was by/about/on Chomsky.
         b.   the destruction of the city
                 *The destruction is of the city.

This shows that modifiers are more independent from the semantics (=the LCS) of the head.

6. Adjectives..

Recent research has advanced our understanding of adjectives mostly by spelling out its mixed verbal and nominal linguistic properties, and by correlating the latter with the semantics of the adjectives. The starting point might be the age-old correct idea that *adjectives express properties*, that is, the *sense* (or intension) of an adjective, like *round, white, fluid* is a property, and the respective property, roundness, whiteness, fluidity picks up a set or class of objects which constitutes the *referent* (or extension) of the adjective: the set or class of round things, the set of white things, the set of fluid things which we could represent as λx round(x), λx white(x), λx fluid(x) (where λ is an abstraction operator, i.e. λxPx is read as 'the class of xs such that Px' or 'the class of those entities that have property P'). Therefore, we may say that adjectives denote *property sets* (a property set is the set of all those objects which satisfy some property). The second basic fact is that most adjectives have both a *predicative* and an *attributive* use, illustrated below:

(69)   a.   The ball is round.
         b.   This man is kind to his neighbour.
         c.   round ball
         d.   kind man

Adjectives that have a predicative use are quite similar to verbs. They may subcategorize for particular types of prepositional objects (*interested in, amazed at, crazy about* etc); more importantly, they have θ-grids and θ-mark their arguments: e.g. *kind* in (69b) identifies its arguments as (Experiencer (Theme)). Like verbs, predicative

adjectives must externalize and project at least one argument, which functions as subject of the nominal predicate, as in (69a, b). Predicative adjectives differ from verbs only in that they cannot carry inflection features (tense in particular) and a copulative verb (e.g. *be, become* etc.) is needed as a carrier of Inflection (i.e. Inflection is subcategorized for VP not AP).

Adjectives also have a second, typical mode of construction: the attributive use. In this use, they identify their (externalizable) argument variable with the internal variable of a noun, so that the same variable is referred to by both the adjective and the noun. This is the semantic operation that was called θ-identification, which underlies the relation between modifiers (in this case, the adjectives) and modifees (in this case, the nouns). The expression *round ball* will thus designate the set of entities which are both round and balls, i.e. λ x[round(x) ·ball(x)]. It will be seen that the situation is more complex than one may think at first sight.

The close semantic tie between adjectives and nouns may be grammaticalized as a relation of agreement between adjectives and nouns. In languages like Romanian adjectives are indeed inflected for gender, number, case (e.g. *frumos / frumoasă / frumoşi / frumoase*). Adjectives may thus have φ features. Since the adjective may be both an argument-taking and θ-marking predicate and a carrier of nominal features like gender, number, case, the adjective is usually categorially described as [+N +V].

A third fact whose significance for the general semantic and morpho-syntactic description of the adjective has not always been appreciated is that adjectives are inflected for the category of comparison. In fact, since this category is really the one that differentiates adjectives (and adverbs) from nouns and verbs, we expect this category to be the manifestation of an essential property of adjectives. Again our discussion focuses on "central" adjectives which exhibit degrees of comparison (e.g. *fair, kind, tall, good*), leaving aside the so-called absolute adjectives (e.g. *round, dead, square* etc.), which are not used in the comparative (*more round, *squarest).

Comparison is related to an essential property of prototypical adjectives like *good* and *tall*, namely the fact that *adjectives are vague predicates* in a sense to be explained below. Comparison can illuminate the way in which we understand and assign truth to sentences containing predicative adjectives. The process of determining the reference of the adjective in various situations in order to assign truth to sentences containing predicating adjectives will shed light on the semantic connection between adjectives and nouns, which has been grammaticized in the attributive adjective.

6.1. The most important semantic property of typical adjectives is that they are *vague*. To understand this, suppose we want to compute the truth value of the following two assertions: *X has read some Shakespeare* and *He is tall*. In the first case, the sentence makes full sense if X is the sort of individual to which the predicate *read* may apply, that is, X should be a person, rather than say a pet dog; but once we have picked up the right sort of subject entitiy, it is straightforward to sort out the set representing the universe of discourse U into people that have and people that have not read some Shakespeare.

Consider now 'X is tall' used in a situation where we consider, as we did before, all the entities in the universe of discourse to which the predicate *tall could* apply. On this *global scale* of things some mountains will turn out to be tall, while most other objects will turn out not to be tall. In particular, assertions like *The grass is tall, My baby brother is tall* would always come out false. This shows that our procedure of computing the truth value of a sentence whose predicate is an adjective is inadequate. In fact, in estimating the truth value of 'X is tall', we should each time consider a relevant subset of the objects to which the predicate can, in principle, apply. Let us call this subset which is *contextually* determined, *the comparison class.* In the three sentences below, the comparison class is likely to consist of the set of Americans, the set of buildings and the set of trees, so that (70a) below says that President Clinton is tall for an American, The Empire State Building is tall for a building, etc. In each case we want the extension of *tall* to become focused on a particular subset that we called the comparison class. Comparison classes show a first sort of *context dependency of the adjective*, a first consequence of their being vague predicates. Notice also that the comaprison class is likely to be the extension (property set) of some noun: *building, tree*, etc.

(70)   a.   President Clinton is tall.
          b.   The Empire State Building is tall.
          c.   The tree in John's garden is tall.

Consider now the evaluation of an assertion like *Bill is tall*, when we have already determined a comparison class, say the set of human beings; we will find that the adjectice is vague in yet another way. Suppose that we are trying to establish the extension of *tall* in that particular situation. In any given context of use, there will be some people whom we consider to be definitely tall, others who are definitely not tall (i.e. those who are short), and yet others who are somewhere in between. This suggests that the extension of *tall*, at any context, should yield the value 'true' for members of the first group, the value 'false' for members of the second group (the short people), and no truth value can be defined for the individuals in the 'neither-tall-nor-short' group that constitute a kind of 'extension gap' for the adjective. In contrast, nouns (*cat, bird, animal*) and verbs (see example above) are 'sharp' predicates: they can divide the relevant entities in a context into two complementary sets: the entities that unambiguously have the relevant properties (the individuals that are cats, the people that have read Shakespeare), which form the positive extension of the predicate, and the individuals that clearly do not possess the designated property (the individuals that are not cats, the people that have not read Shakespeare) and there will be no extension gap.

Suppose now that we are told to exhaustively sort out a group G of people into tall and not tall members. As before, we start to work and after a while we have divided G into three smaller groups: those who are definitely tall according to our standards,

those who are definitely not tall and the third group we cannot quite decide about. However, if we want a more precise categorization, we may, as suggested by Klein (1980), reapply *tall* to the *extension gap* (the 'undecided' group); the meaning of *tall* stays the same, but the comparison class is changed. In order to make the adjective sharper, we must systematically modify the comparison class in a series of stages, focusing at each stage on the extension gap left at the prior stage, etc.

It may be that the set G left to sort out with respect to some adjective like *tall* has only two members, u_1 and u_2. Then one member, say u_1 should go in the positive extension of *tall*, and the other, u_2, should go in the negative extension of *tall*. If the first member is taken as a reference point, we will say that u_1 is taller than u_2; if u_2 is taken as reference point, we will say u_2 is less tall than u_1.

Comparison appears to be a particular case of determining the extension of the adjective, the case when only two objects are assumed to be in the comparison class, one of them will be taken as a reference point.

Adjectives like *tall, heavy, long, old* are said to be *linear* adjectives. They single out some *semantic dimension* or *property* (height, weight, length, age) and can impose a linear ordering on the entities in the more limited domain (of discourse) which is the comparison class. The category of comparison expresses the ability of the adjective to impose a linear ordering on the objects of a set; this means that for any two objects in the comparison class u_1 and u_2, which are denoted by NP_1 and NP_2, the sentence NP_1 is A-er than NP_2 or 'NP_1 is less A than NP_2 ' has a determinate truth value. In contrast, the simple assertion 'NP_1 is A' is true only about the members that cluster in the 'upper region' of the extension, so that the referent of $NP1$, u_1 is taller than the average height relevant for the given comparison class (thus the height of a *tall American* may be vastly different from the height of a *tall Chinese*).

Linear adjectives are vague in the sense of being *gradual*, i.e. the fuzzy *boundary area* between objects of which the adjective is true and those of which it is definitely false can be conceptualized as a *gradual transition*. Graduality is resolved in context by the allocation of an appropriate comparison class, as part of the context specification. Linear adjectives come in pair of *antonyms* which lexicalize the upper, and respectively the lower, extremes of the semantic dimension: AGE, *old/young*, LENGTH, *long/short*, etc. Notice that, for some, though not all, antonymic sets, one of the adjectives in the set (the 'unmarked' member) may simply be used as a name for the semantic dimension or property itself.

(71)   a. 'How old is the baby?' ' He will be three weeks on Monday.'
        b. It is only ten centimeters long.

For reasons that are probably clear, when they are used in the comparative, adjectives simply name the property along which comparative ordering is established and the comparative assertion does not entail the positive of the adjective.

(72)   a. John is taller than Bill. Both are of just average height for teenage Americans.

b. Robert is smarter than Richard, but neither is really smart.

Adjectives that do not have the comparative, the so-called absolute adjectives, do not impose any linear ordering on their extension; they are *not gradual* and, like other sharp predicates, divide a relevant set into two complementary subsets (the objects that satisfy the property and the others) leaving no extensional gap. Such adjectives are *blue-eyed, round, square* or complementary pairs like *dead/alive, married/single*, etc.

In sum, linear adjectives evince the peculiar type of vagueness that we called graduality. Comparison is the linguistic correlate of graduality and linearity.

6.2. There is also another category of adjectives that fail to be *linear* although they are *gradable* and allow for comparison. They fail to be linear because they fail to inherently specify one semantic dimension for ordering.

A good example is *clever*. There is no single criterion of application which alone determines whether a person is clever. Indeed, the adjective is associated with a number of criteria, and these fail to constitute one set of necessary and sufficient conditions for cleverness. Let us suppose, for the sake of the argument, that there are only two properties associated with being clever: an ability to manipulate numbers (*clever mathematician*) and an ability to manipulate people (*clever politician*). Anyone who possesses both these properties wil certainly be clever, and anyone who possesses niether will actually not be. Now, suppose that Sue is better than Dick at manipulating numbers, whereas Dick is better than Sue at manipulating people. In a context c where both criteria are potentially relevant and where there is no accepted method of weighing them against one another, it is difficult to see what the truth value of (73) would be since mathematicians and politicians do not compare easily:

(73)   Sue is cleverer than Dick.

Non-linear adjectives like *clever* exhibit a second kind of vagueness: *indeterminacy*. It is indeterminate which particular criteria have to be met for an adjective to be true of an object. A notorious example is the adjective *good*, which can mean 'sharp' when used with *knife* (i.e. 'good as a knife'), 'comfortable' when used with *chair*, 'skillful' when used with *violonist* (i.e. good as a violonist). *Good* is not an isolated example. All evaluative adjectives behave like *good;* other examples: *great, swell, fine, nice, excellent, bad, lousy, rotten, striking, terrible, awful*. The interpretations of these adjectives are *relative; they depend on the meaning of some nouns*. Indeterminacy is resolved at the level of the adjective + noun combination. Katz (1964) proposes that functional information stored with the head noun determines the relevant meaning, the *relevant semantic dimension*, considered in each application of

the adjective. Through combination with a noun, an indetermiante gradable adjective is thus linearized.

Thus *good* alone does not determine any comparison class, but *good chair, good mother*, etc. determine a set which can be linearly ordered by comparison (*He is a better teacher than his brother*, etc.). Notice that an *as* paraphrase often expresses linearization of an adjective: *good violonist/good as a violonist; bad library/bad as a library; clever politician/clever as a politician*, etc.; absolute adjectives and inherently linear ones are not happy with the *as* paraphrase: *round ball/*round as a ball, red apple/*red as an apple; tall student/*tall as a student; heavy box/*heavy as a box*, etc. (cf. Siegel(1979)). Absolute adjectives like *alleged, only, extreme* also depend for interpretation on the meaning of a noun: somebody who is an *alleged musician* is not somebody who is both 'alleged' and a 'musician', but somebody who wrongly claims to be a musician.

This long excursus into the semantics of the adjective was meant to bring to light two significant adjective-properties: a) The most typical property of central adjectives like *tall, long, good*, etc. is *graduality*; such adjectives impose a linear ordering on the members of some set. *Comparison* is the formal counterpart of this typical adjectival property. b) The interpretation of adjectives was found to be dependent on the interpretation of nouns in various ways: nouns sharpen indeterminate adjectives or linearize them; the comparison class is also determined as the contextually relevant subset in the extension of some noun (*tall child*, 'tall for a child'). This semantic dependency of the adjective on the noun is grammaticized in the attributive use of the adjective (not shared by verbs), and also in the fact that nouns and adjectives may share agreement features for number, gender, case.

6.3. Let us examine θ-identification once more from the vantage point of our discussion of the semantic properties of adjectives. The existence of non-linear adjectives suggests that at least some adjectives need to be viewed as if they were operators on the meanings of nouns, or on nominal property-sets. Let us call such adjectives *relative or intensional adjectives*. It is as if the value assigned to the open position of the adjective is the property expressed by the noun: $[A(N)](x)$. An intensional adjective (e.g. *good, alleged*) designates the set of nominal properties (or the nominal-property sets) that it can modify: *good knife, good mother, alleged lawyer*, but not **good square, *alleged table*. *Good* will thus operate on the set picked by the property of 'being a knife', 'being a mother', etc, and to say that somebody is a good mother is *not* to say that she is good in some absolute sense and that she is also a mother, what we are saying is that she is good for a mother.

In contrast adjectives like *round, solid, tall, beautiful* all predicate over individuals, so that *round table* designates the class of those objects which are round and which are tables $\lambda x[round(x) \ table(x)]$. Adjectives like *round, solid, tall* which predicate over individuals, in contrast with those that, like *good*, predicate over properties, are called *extensional* adjectives.

Therefore, a modifying adjective A in a structure A(N(x)) may either predicate over the noun's internal variable (when the adjective is extensional and A(N(X)) = [A(x)∧N (x)], e.g. round((table(x)) = round(x) and table(x) or it may predicate over the property expressed by the N, i.e. [A(N)](x) e.g. (good (mother(x))) = [good (mother)](x).

These are the semantic operations that underlie the relation of modification and the projection of the modifiers. The terms used by Higginbotham (1981) to designate the two types of combinations are θ-identification and, respectively, autonomous θ-marking (for the intensional case). Speas (1991) prefers to unify the description and say that the open position in the θ-grid of the modifier is discharged by merging either with the individual variable of the modified N, or with the property variable N, itself. She speaks of *merger* in both cases.

The semantic distinction extensional/intensional adjective only very imperfectly correlates with the syntactic attributive/predicative fact of subcategorization, since most adjectives occur in both positions and their interpretation does not change. *Round* is an absolute adjective both in *round table* and in *The table is round; good* is an intensional adjective in *good knife* and also in *This knife is good.* The most that can be said is that adjectives which are always and only attributive (*utter, alleged, former*, etc.) are intensional and adjectives which are only predicative (*ablaze, afire, awash*, etc.) are extensional (see examples in (74) - (77)).

(74)   an utter confusion
         an alleged genius
         a former president

(75)   *The confusion is utter.
         The genius is alleged.
         The president is former.

(76)   The house is ablaze.

(77)   *an ablaze house

An observation we can make at this point is that adjectives that have no predicative use, like those in (74) - (75) cannot project and θ-mark arguments. Likewise, in many languages adjectives function as nouns and, in that use, do not project or θ-mark arguments: e.g. *The rich are happy.* Since not all the adjectives are θ-assigners the adjective should be categorially described as [0V] rather than [+V], if one uses the three-valued system proposed by Reuland (1987). In the same way, since there are languages like English which do not have agreement of the adjective we may describe adjectives as [0N], instead of [+N]. The categorial description of the adjective is this [0N, 0V], rather than [+N,+V].

Incidentally, the difference between attributive and predicative adjectives is very well marked in many languages: German has agreement of the attributive, but not of the predicative adjectives, and there are languages that lack attributive adjectives altogether.

To maximize the descriptive correspondence between meaning and form, we could always analyze attributive adjectives as higher predicates over nominal properties, and simply say that for extensional adjectives the higher type reading is equivalent to the lower type i.e. $\lambda x [A(N)] x = A(x) \cdot N(x)\}$. For instance we may say that *heavy*(N) denotes the class of N properties that it can modify: *heavy box, heavy smoker*, *heavy honesty, i.e. $\lambda N(heavy(N))$; in certain instances only, the property denoted by *heavy* is directly applicable to the individuals in the set denoted by the noun, e.g. $\lambda y[heavy(box)]y = \lambda y[box(y)$ and $heavy(y)]$, but this is not true for $\lambda y[heavy$ smoker$](y) \neq \lambda y[smoker (y)$ and $heavy (y)]$.

7. Prepositions.

In this section, we will briefly discuss the class of prepositions (more accurately one should speak of adpositions, since it is the head initial/head final parameter that dictates whether in a language we are dealing with prepositions (head initial constituents) or postpositions (head final constituents)). Prepositions constitute an intermediate category between lexical (open) categories and functional (grammatical) categories. They ought to be viewed as a grammatical category in virtue of the fact that they make up a *closed set*. Yet, they have an important property in common with lexical, open class, categories: they may assign θ-roles directly or in conjunction with a lexical category (N, A, V).

From high school definitions, it is known that prepositions relate two categories, for instance, a verb and a noun phrase. Prepositions must be viewed, semantically, as binary predicators $[P(x)](y)$, where x is(the index of) the category that licenses the preposition itself, and y is the object of the preposition.

a) When the preposition is subcategorized by a N, V, A, the licensing category (i.e. x in $[P(x)](y)$ is precisely (the index of) the head governing the PP, in conjunction with which a thematic role is assigned to the object of the preposition (y):

(78)   a. John depended on his parents. $[V_x \dots\dots\dots [P(x)(y)]$
        b. his interest in art $\underset{\theta}{\smile\!-\!-\!-\!-\!-\!-\!-\!-\!-\!-\!}$

The obligatory internal (structural) argument of the preposition is, thus, empty and it has to be identified for the PP to be licensed. For subcategorized prepositions, it will be identified as (the index of) the lexical head that licenses the PP; moreover, the object of the preposition is discharged by identification with one of the arguments in the θ-grid of the licensing V, A, N. The role of the object is assigned by both the V, A, N and the Preposition. The contribution of the preposition varies; generally, when there is choice between competing prepositions, their semantic role is enhanced: e.g. *vote for/ against a proposal*.

b) When the PP is an adjunct, the PP does not formally depend on a head, but it does semantically depend on the clause, which describes events. As already shown in our discussion of verbs, adjunct PPs are licensed by the event variable in the predicate's thematic structure.

(79)   a. It was raining in London yesterday.
       a'. $\exists$e[(raining (e) • IN [+Place] (e, London) • TIME (e, yesterday)]
       b. He met her after a year.
       c. He did it with a gun.

The adjunct PPs identify the place, time or instrument of the events that license them. The paraphrase in (79a') says that there is an event of raining and the place of this event is London, and the time of this event is yesterday.

Notice that most adverbial subordinating conjunctions of time, concession, etc. (e.g. *before, after, although*) can be analysed as prepositions subcategorized for clauses (i.e. for the categories IP or CP). Some of these formatives accept both NPs and clauses (IP/CP) as complements, others accept only one of the two categories.

(80)   a. He slept [until [noon]$_{NP}$]$_{PP}$
            b. He slept [until [his mother arrived]$_{IP}$]$_{PP}$
            c. He bought the car [although [it was expensive]$_{IP}$]$_{PP}$
     R   d. A ajuns [înaintea [lui Ion]$_{NP}$]$_{PP}$
            A ajuns [înainte [ca Ion să le dea de veste]$_{CP}$]$_{PP}$

     e.
        P'
     P———NP

     f.
        P'
     P⁰——{CP / IP}$_P$
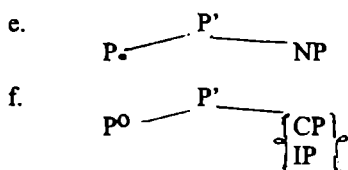
This analysis has been current for English since Emonds (1976); the analysis would explain the homonymy of many prepositions and subordinating conjunctions, coordinating conjunctions (e.g. *and, or, but*) will remain in a class apart of elements that join formatives of equal rank and do *not* assign θ-roles. Since some prepositions may θ-mark this arguments, we may analyze them as [0V]; and since they are never argumental they must be analized as [-N]. Their categorial features are then [-N, 0V].

7.1. We conclude that lexical categories are licensed by thematic relations; being θ-role assigners(+V or 0V) or being θ-role receivers (i.e. arguments or adjuncts).

Class features, which thus have some substantive content, percolate as properties of projections and determine the admissible combinations of phrases. To differentiate between functional categories and thematic ones, we introduce the feature ±F(unctional).

8. More on functional categories.

The list of typical functional categories includes determiners and pronouns, auxiliary verbs, complementizers, inflectional constituents. The theory of functional categories represents a recent development in the theory of syntactic categories (see

Abney (1987), Pollock (1988), Valois (1991), Baker (1988) a.o.) and it is "still in the making". The difference between functional categories and lexical categories overlaps the opposition between open sets and closed sets.

The main properties of functional categories will emerge from applying the same analysis in their case, that we applied in the case of lexical categories, namely a description in terms of their *categorial* and *subcategorial properties*, and in terms of their thematic properties.

The intuitive difference between lexical and functional categories is that lexical categories have lexical conceptual structure, that is 'descriptive content', while functional categories have the role of connecting syntactic units into "articulated discourse". Let us try to list the main properties of functional categories, from some of the more easily observable ones to those which are more abstract and really defining.

1) Functional categories (determiners, pronouns, etc.) constitute closed sets, seldom having more than twenty-thirty members.

2) Functional elements are usually phonologically and/or morphologically dependent; they are often stressless and may develop weak, contracted forms (think of the English auxiliaries and modals); they may be realized as clitics or even as affixes; for exam ple, the Romanian definite article, unlike the other Romanian determiners is an affix: *acest copil, copilul*).

3) Functional elements are characterized by "unique morpho-syntactic behaviour" (cf. Edmonds (1985)), in the sense that the members of functional categories cannot be differentiated from each other only by purely descriptive semantic features. For any item in a functional category, the expectation is that there may be at least one rule of the grammar which treats it differently from some related item. This amounts to saying that grammatical words *have to be learned individually* and that one does not count as knowing a language before one has mastered the 'grammatical words' of that language.

A very good example of the 'unique' behaviour of each grammatical word is provided by the English modal verbs. On the one hand, modal verbs like *can, may*, which are members of the category Inflection, differ from their lexical synonyms, *be able to, be allowed to*, etc, on the other hand, there are individual differences between *can* and *may*, for instance, in the way they treat negation in their epistemic sense: *He may not get there before seven* (It is possible that he will not get there before seven) vs *He cannot get there before seven* (It is not possible for him to get there before seven).

The determiners below illustrate the same idea of unique syntactic behaviour of grammatical words; no two items appear to have exactly the same distribution:

(81)   a. The boys will all/each/both/*some/*every get a prize.

        b. All/both/*each/*every/some sat down in the end.

        c. All/both/*each/*every/some boys sat down.

        d. *All/*both/each/every/some boy sat down.

(82)   a. What/which book do you want?
        b. What/*which else do you want?
        c. *What/which of them do you want?

4) While lexical categories are inserted in the D-Structure, functional elements, which simply spell out sets of grammatical features may be subject to *late lexical insertion*, precisely because certain features may change during the derivation (e.g. case-marking prepositions like *of* in tranzitive nominalizations (e.g. *The building of the bridge*) may be inserted at S-Structure; agreement features are checked at S-Structure, etc.

5) An essential property of functional categories is that they are *semantically abstract*, they lack *descriptive content*. They serve to express certain morpho-syntactic features which are not regularly expressed by the lexical category they combine with. For instance, in English, the emergence of a category of grammaticalized modal verbs, i.e. the members of the category Inflection, is related to the loss of subjunctive verbal inflections; modal verbs become subjunctive mood markers. It is also possible that some morpho-syntactic feature is *consistently* realized as some functional category, but that it is also, at least sporadically marked in the lexical category the functional category combines with.

For instance, in German, French, Romanian, gender is consistently expressed by the functional category Determiner, but in all three languages there are *derivational* gender suffixes, so that some nouns get lexical marking for gender, in addition to the grammatical marking of gender by the determiners (83b, d). In addition, in Romanian, noun stems may also indicate gender, consonantal stems (*copac, chibrit*) indicate masculine or neuter nouns.

(83)   G.   a.   Der Mann (m) die Frau (f) das Kind (n)
                  b.   der Student (m) die Studentin (f)
        F.   c.   un homme (m) une femme (f)
                  d.   un étudiant (m) une étudiante (f)
        R.   e.   un bărbat (m) o femeie (f) un chibrit (n)
                  f.   un student (m) o studentă (f)

Although they have no descriptive content, functional categories often play an important semantic role: their semantic contribution is second order; functional categories are operators on the lexical categories they occur with. They "pass on" and *qualify* the descriptive content of lexical categories.

6) The novelty in the approach to functional categories regards their syntax; functional categories I^0, Det^0, C^0 are viewed as *heads of lexical categories*. Inflection has already been analyzed as the head of the VP.

The most important formal property of a functional category is that it is *subcategorized* for a *unique complement*, which is not an argument (or an adjunct). Functional categories *do not θ-mark their complements* (Remember that it was a

defining property of auxiliary verbs, which are functional constituents, that they did not θ-mark their complements, unlike lexical verbs). Lack of θ-marking is one way of characterizing the more abstract nature of functional categories. Each functional category selects a particular type of complement, Inflection selects VP, Determiner selects NP, etc.

7) Functional categories project regularly (cf. Chomsky (1986b)). They license one complement through functional selection, and they may also license one specifier, through some grammatical mechanism like specifier-Head Agreement. Unlike lexical categories, functional categories do not allow iterated specifiers; this is normal because iterated specifiers (e.g. *important recent book*) were licensed due to the semantics of the head, and functional head lack descriptive content. In the following pages a few examples of functional categories will be examined.

8.1. Inflection. All these properties were very clearly represented in the case of Inflection.

a) Inflection functionally selects (f-selects) one complement, the VP, I' →I⁰ VP.

b) The complement is not θ-marked.

(84)   a. $I^0 \rightarrow [\pm Tense, \pm Agr]$ (Modal)
       b. $I' \rightarrow I^0$ VP
       c. $IP(=I'') \rightarrow NP$ I'

       d.
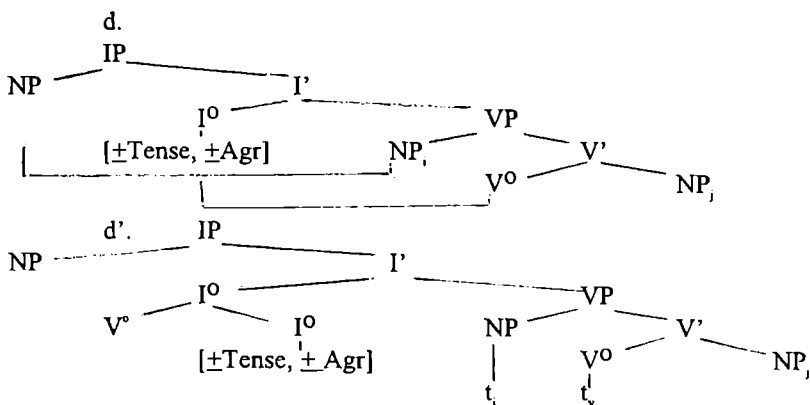
c) Inflection may license, and English it does license, an NP Specifier position, which is the subject position in English. Support for the connection between Inflection and the subject comes from the relation of agreement, what we have called Spec-Head Agreement: *These boys were here.* In sum, Inflection projects regularly, as shown in (84) above.

d) Semantically a VP like *meeting Mary* or an untensed proposition like *John's meeting Mary* designates a class of events. Inflection is a second-order predicate on this

class of events, actualizing the potential reference of the VP or of the untensed proposition. Inflection may be regarded as a binder of the event variable in the proposition, or as a second-order predicate on the event variable, locating this event in time (and in some world, cf. (Enc, 1987)), so that a sentence like (85a) is interpreted along the lines suggested in (85b).

(85)   a. John met Mary.
        b. There is some interval of time t and some event e which is a meeting event, involving John and Mary and t is PAST and e occurred at t.
        c. $[_{IP}$ John $[_{I'_{<e>}} [_{I_0} [+\text{Tense}, +\text{Agr}] [_{VP_{<e>}} \text{meet Mary}]]]$

As shown in (85c) the event variable is discharged at VP level by the Tense Inflection which can be viewed as a binder of the event variable or as a predicate over it.

Notice in (85c) that since I^0 is the operator on the event variable, it is the syntactic position of I^0 which is relevant for the semantic interpretation of the inflected verb. We therefore have to assume that all verbs raise to tensed Inflection at the level of semantic interpretation, that is, at the level of LF (see (84d, d')). This movement obligatorily occurs in syntax for all French and Romanian verbs and for the English auxiliaries. We remember that lexical verbs undergo Affix Hopping, that is, the Tense Inflection is lowered on the V creating an improper chain (because the trace of Inflection is not c-commanded). It is assumed that at the level of LF the tensed verb raises to the position of Inflection (84d'), leaving behind a properly governed trace, so that the Empty Category Principle is satisfied at LF.

e) Inflection also shows the other properties typical of functional categories. It has a limited number of members -*s*, -*ed, can, may, shall, will, must, do*, exhibiting highly irregular behaviour. The perceptive reader must have noticed an essential aspect in the membership of Inflection, the fact that it contains both *free* morphemes (the modals) and *bound* morphemes, *inflectional affixes* (*s -ed*). It is accepted that some *inflectional* affixes can be viewed as syntactic elements, occupying independent positions in syntax and regularly projecting structure. This idea has been very fruitful in the study of syntactic phenomena (e.g. verb syntax in French, English, Romanian).

A word of caution is needed here: the existence of some inflectional category (e.g. Number, Case, etc) in a language *does not automatically entail the existence of a syntactic projection of that category*. A syntactic projection is warranted only by distributional syntactic facts of a particular language. Thus in the particular case of English, setting up a separate Tense position made possible the understanding of a cluster of syntactic facts such as Do-Support, the syntax of interrogation and negation. Internal motivation is thus required for setting up functional projections.

We thus expect important, principled cross-linguistic variation at the level of functional categories. To quote Chomsky (1992: 419) "if substantive elements (verbs, nouns, etc) are drawn from an invariant universal vocabulary, then only functional elements will be parametrized."

A second observation is also called for; since functional categories may include certain inflectional affixes among their members, the term part of speech becomes a rather imperfect synonym of the term functional category and we really are developing a theory of syntactic categories (= a theory of the primitives and combinations of syntax) rather than a theory of parts of speech (free morphemes, words). Some of the words in a sentence (i.g. inflected verbs) will be *post-syntactic words*, i.e. forms fully spelled out in the course of the derivation and assigned a phonological matrix at the level of phonological form (PF).

As to the categorial description of Inflection, in view of what we have said so far, we shall assume it to be I: [$\pm$N, +V, +F]. The $\pm$ N variation expresses a distinction between a pronominal inflection that "stands for" the subject, as in the Romanian *Citeşte* (i.e. *El / ea citeşte*) and a less rich inflection that needs to be specified by a lexical subject: *He is reading/*Is reading*.

9. Determiners.

The functional category typical of the lexical category noun is that of determiners. This category meets all the criteria for functional categories. The category Determiner includes a limited number of members; in the terminology of Jackendoff (1977) (at least) the following groups of elements are included in the category of determiners: a) articles, elements inseparable from the nouns they determine: the definite article, *the*, the indefinite article *a/an*, the negative indefinite article *no;*. b) demonstrative determiners: *this, these, that, those;* c) article-like quantifier (i.e. quantifying elements that have the *syntactic* position of articles); *every, each, all, some, any, what, which,* etc. These elements have idiosyncratic behaviour, having specific distributional and interpretative properties (see the examples in (81) and (82) above which show differences between *all / every / each / some,* as well as differences between *what / which.* d) We assume that determiners (i.e. D⁰ elements) act as functional heads which f-select an NP complement, as expressed in rule (86). Determiners are thus subcategorized for an obligatory NP complement [-NP]. Notice that the NP structure is now simply viewed as in (87). Nouns may have iterated specifiers (87a), adjuncts and complements (87b).

(86)   D' → D⁰⌒NP   (e.g. [$_{D_0}$ this [$_{NP}$ man]]

(87)   a. N^{max}(=NP) → (SpecN') N'
        (or N^{max}(=NP) → (SpecN') N'   (Adjunct)
        b. N' → N⁰   (Complements)
        c. fairly tall blue eyed brother of Mary
        c'.
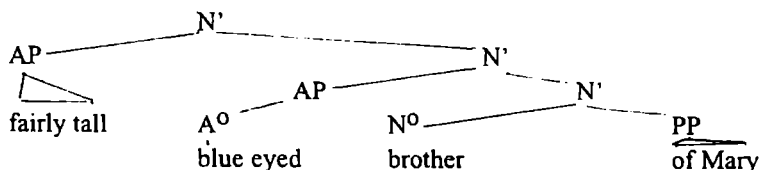
The determiner as head analysis has a great deal of plausibility and had often been proposed in the literature before the advent of the theory of functional categories (cf. Hellan (1983)).

⌐In many languages, the determiner is the most important morpho-syntactic element of the nominal phrase. It often carries the features of case, number, gender, determining agreement with the verb.⌐Thus, although *all / every* are both universal quantifiers so that the two sentences below are truth functionally equivalent, agreement features differ as a consequence of using different determiners: *All students in my class got a prize / Every student in my class got a prize*. In Romanian, case features are uniformly realized on determiners; only feminine nouns show case variation, masculine and neuter ones do not: .

> (88) N. Acc: un băiat (m)   un chibrit (n)   o fată (f)
>   G. D.   unui băiat   unui chibrit   unei fete

e) The semantic role of the determiner is crucial. It binds the internal structural variable of the noun, turning a predicative expression, whose referent is a property / set (: *horse*: $\lambda x\ horse(x)$) into a saturated expression, *a term* or *an argument*, (e.g. *this horse, some horses)*, which designates a particular individual or groups of individuals. The internal variable of the noun is thus discharged through *binding* or θ-binding (cf. Higginbotham (1981)). The determiner / binder closes off the nominal projection, and makes possible the argumental use of the noun in discourse: **I saw horse / I saw a horse*. Arguments (= Determiner Phrases = DPs) bear referential indices which indicate relations of coreference: *When he, entered the room, John, saw his, friend.*

> (89)

Two remarks are perhaps needed at this point, bearing on determiners and their binding roles. a) If we agree that binders (i.e. constituents which allow nouns to function as arguments by binding their internal variable) belong to the syntactic category Determiners, then cardinal numerals, ordinal numerals, and lexical quantifiers like *many, much, few, several* should be included in this category. Indeed, they may subcategorize for [-NP], just like all the elements in listed above.

> (90) a.   Seven bright students will get grants.
>   b.   Many bright students will go to London.

At least in examples like (90), it is natural to admit that these quantifiers are in head D^0 position. Cardinals, ordinals and lexical quantifiers can also occur after the already-mentioned determiners, as shown in the examples below:

(91) a. $[[_{D_o}$ the $[_{NP}$ seven deadly sins$]]$
      b. $[[_{D_o}$ those$]$ $[_{NP}$ many problems$]]$
      c. $[[_{D_o}$ every$]$ $[_{NP}$ two days$]]$

      d.

```
            D'
       ┌─────┴──────────┐
     Dᴼ                  NP
      │          ┌────────┴────────┐
      │         QP                 N'
      │      ┌───┴──┐          ┌────┴────┐
      │     Qᴼ      QP        AP         N'
      │      │             ┌───┐      ┌───┴───┐
      │      │            Aᴼ             Nᴼ
     the    seven        deadly        sins
```

In examples like (91), the quantifiers occupy the position SpecNP, as shown in (91d). In other words, they behave like numerical adjectives, exhibiting properties different from their properties in the Do position (cf. Giusti 1992, Cornilescu 1992). b) The second remark is that DPs may function predicatively as is the case in (92); the indefinite article does not bind the internal variable of the noun, and this variable is projected as the subject of the sentence; sentence (92) is parallel to (93), where the predicative is an AP; the role of the indefinite article is purely morpho-syntactic in (92).

(92) He is a student.
(93) He is hardworking.
(94) El este student.

Notice that because the article is semantically superfluous with predicative nouns, it may be left out in certain languages, at least sometimes. Romanian provides an example (see (94)).

c) Determiners will be assumed to project regularly. The unique Specifier position of the DP may be filled in the D-Structure by a DP in the Genitive, in the case of English. We have to admit that the Genitive occupies the specifier position since it is a *phrasal* constituent and could not be in the head position D^0. If the position SpecD' is not initially filled, it may be the lauding site for XPs that move within the NP, in examples like *so tall a man, such a tall man* (97).

(95) a. DP →SpecD' D'
          D'→Dᴼ NP
      b. my brother's new car
      c.

```
                   DP
          ┌─────────┴──────────┐
         DP                     D'
        ╱  ╲              ┌──────┴──────┐
       ╱    ╲            Dᴼ             NP
      ╱      ╲            │         ┌────┴──────┐
     ╱        ╲           │        AP           N'
    ╱          ╲          │         │           │
 my brother's   Ø        new       car         Nᴼ
```

(96)

```
              DP
        AP         D'
      /\        D⁰      NP
     /  \        |     AP    N'
    /    \       |     |     N⁰
   so tall       a     t     man
```
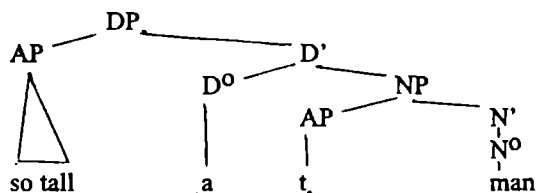
Viewed cross-linguistically the class of determiners includes free morphemes, as well as inflectional affixes. A familiar example is that of the Romanian definite article, which is an affix in enclitic position, -L, unlike the other determiners, which are free morphemes and always occur in front of the noun (with the apparent exception of demonstrative determiners, which occur both prenominally and post-nominally: cf. *acest copil / copilul acesta* (see Cornilscu (1992) for an anlysis of Romanian demonstratives).

(97)   a. un copil
        b. fiecare copil
        c.oricare copil
        d. acest copil
        e. copilul

(98)   a.

```
          D'
    D⁰           NP
    |            N'
    |            N⁰
    un           |
    fiecare      copil
    acest
    -L
```

        b.

```
              D'
         D⁰         NP
    N⁰        D⁰    N'
    |         |     N⁰
    copil  + u +  L    t
```
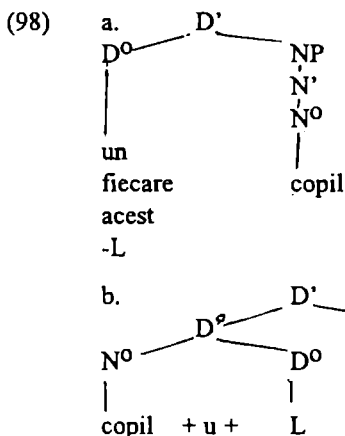
The data in (97) can easily be explained, as in (98a,b); since the definite article is an affix, it cannot remain isolated; the head noun moves up to D^0, and adjoins to the article, by means of the now familiar rule of Head-to-Head movement. The trace left by the noun is properly governed.

The categorial description of determiners is that of nouns (+N, 0V, -F), except that they never θ-mark constituents and that they are functional categories; their features will then be [+N, -V, +F]. From here on we will be using the unabbreviated

designations nominal phrase or 'noun phrase', as a means of referring to DPs (or NPs, when the difference is immaterial). Unless otherwise specified, the symbols DP, NP name distinct syntactic entities.

Pronouns. Before closing our discussion of determiners, we want to make a brief comment on the class of pronouns, viewed as a *paradigmatic* class (as a part of speech). Irrespective of their quite heterogeneous morpho-syntactic and semantic properties, all the traditionally acknowledged pronouns share the property of being DP substitutes; they replace noun phrases having the distribution of noun phrases, as shown in examples (99), (100).

(99) a. [$_{DP}$ The tall boy] came to the party.
b. [$_{DP}$ He] came to the party.
c. [$_{DP}$ Somebody] came to town.
d. [$_{DP}$ Everybody] came to town.

(100) The tall boy saw [$_{DP}$ her].
The tall boy saw [$_{DP}$ himself] in the mirror.
The tall boy didn't see [$_{DP}$ anyone] in the garden.
The tall boy couldn't find many in the garden.

In many languages, their morphology indicates that pronouns are D^0 heads with null complements, since they are homonymous with D^0 elements or allomorphs of the latter. Here are a few familiar examples:

(101)	Determiner	Pronoun
English	this book	this
	those books	those
	many books	many
	some fellows	some
	no boy	none
Romanian	fiecare copil	fiecare
	oricare prost	oricare
	mulţi copii	mulţi
	acest copil	acesta
German	dieses Kind	dieses
	jenes Kind	jenes

These elements can surely be analyzed as determiners with null complements, on the models of (102a), (102b), proposed by Abney (1987). But the picture is considerably more complex. Morphological analysis suggests that in certain cases, the nominal complement of a D^0 was incorporated rather than made null; this is obviously the case of forms like *anybody / anything / anyone, somebody / something / someone, nobody / nothing / no one.*

(102) a.
DP
D'
D⁰
that

b.   D'
D⁰ ——————————— NP
 | N'   CP
              N⁰
 those   [ ]   who do not learn

The formation of a pronoun may be a historical process which is fully completed, so that the respective pronoun should be viewed as an X^0 element, therefore, as a word which is not analyzable in syntax. But it may also be the case that it is desirable to treat certain pronouns as post-syntactic words, i.e., as words which emerge during the derivational cycle, because their syntactic analysis still explains the properties of those pronouns. The English forms quoted above are still analyzable; the process of incorporation has recently been analyzed by Baker (1988) as involving head movement: an X^0 head of a complement moves to its head Y^0, and adjoins to it; adjunction may be followed by morphological fusion. If one accepts this view of incorporation, one has a natural account for the fact that the indefinite pronouns mentioned above may be *followed* by (simple) *adjectives*. The adjectives are licensed (by θ-identification) by the nouns in (104a), the nouns raise past the adjectives for incorporation. Nothing licenses the adjective in (103c), however, which is why (103c) is wrong.

(103) a.   any nice person
        b.   anyone nice
        b.   some good food
              something good
        c.   this good food
              *this good

(104) a.   D'
D⁰ ——————————— NP
 | AP   N'
            | N⁰
 some   good   food
                      THING

        b.   D'
             D⁰
D⁰ ————— N⁰   AP ————— NP
 some + thing good   N'
                            t

The fact that nouns like *thing, person, one,place, body, time*, and a few others can be incorporated is a property listed among the syntactic properties of thess items.

Many languages, Romance languages in particular present clitic pronouns: these are X^0 nominal elements which do not project any supercategories. Consequently they have to be adjoined to some syntactic host, with which they form a constituent. Here are examples:

(105) Romanian. Maria l-a văzut.

French Marie l'a vue.

Spanish Maria le ha visto.

We shall discuss clitics in a future lecture. A recent area of investigation is that of the properties of X^0 pronouns (clitics and other formatives with the same properties) in contrast with those of XP pronouns (e.g. Pica (1987), Hestvik (1992)).

10. Complementizers.

Functional heads may also f-select functional complements, not only lexical complements. This is the case of the subordinating particles which were called *complementizers* (the abbreviations COMP and C^0 are in current use). Complemetizers f-select clauses, i.e. inflectional projections (IPs) and project regularly (see (106)).

(106) a. $C'' \rightarrow SpecC'^\frown C'$

$C' \rightarrow C^0 {}^\frown IP$

b.
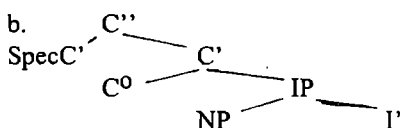
The set of complementizers includes particles like *that, for* in English, *que, si* in French, *daß* in German, *că*, and *ca* in Romanian, etc. These particles represent a subset of subordinating conjunctions (cf. Emonds (1985)). They *crucially* differ from the other subordinating conjunctions in that they do not assign θ-roles to the clauses they introduce quite unlike adverbial subordinators like *because, although, before, after*, etc. Compare: *He came because he loves her.; He knows that he loves her now.*

The relation of f-selection between the complementizer (C^0) its complement (IP) is apparent in the fact that complementizers select a particular type of inflection (I^0); they require the use of particular moods, finite versus non-finite, or of a particular finite or non-finite mood.

(107) a. I still hope [$_{CP}$FOR [$_{IP}$ him TO get this prize]]

b. I hope [$_{CP}$THAT [he will get the prize]]

d. Sunt de părere [$_{CP}$CA [$_{IP}$ele să nu vină]].

c. Sunt de părere [$_{CP}$CĂ [$_{IP}$ele nu vor veni]].

In (107), FOR selects an infinitival clause, while *that* selects a finite complement. In Romanian *că* selects the Indicative, *ca* selects the Subjunctive. The C⁰ position may be filled at D-Structure level by a complementizer, or it may be filled by an inflected verb through Head-to-Head movement. The complementary distribution of inflected verbs and complementizers is best seen in pairs like the following:

(108)   a. I asked whether it was still raining at two o'clock.
         b. Was it still raining at two o'clock?

The specifier position of the CP projection (= SpecCP) houses topicalized constituents, wh-operators among them (see next section).

(109)   a. What did he say?

         b.
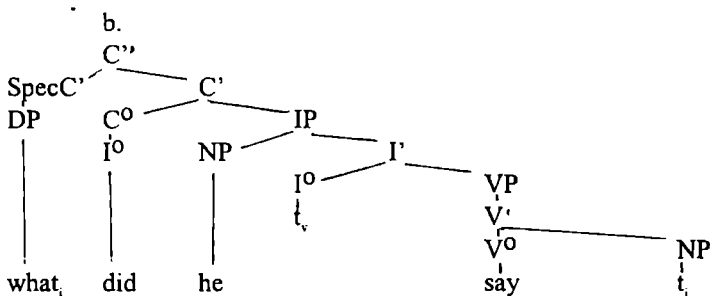
It is more difficult to speak of the categorial properties of CPs , as a class because the properties of a projection depend on the properties of the head, and the head position is open to different types of elements in CP projections. Thus, when the C⁰ position is occupied by an inflected verb, the CP is often (but by *no means always*) a main clause (see (109)), and it is categorially [+V]. In contrast, the role of a complementizer in C⁰ is typically to transform a sentence (i.e. an IP constituent which is [0N, +V]) into an argument, capable of receiving a θ-role (see (108a)); the CP should be [+N] when headed by a complementizer like *that* / *că*; we will assume that complementizers are [+N, 0V, +F] constituents, and that properties of the CP depend on the particular nature of the elements that feel the C⁰ position and /or the SpecC position.

11. Degree words. Concluding on syntactic categories.

We have seen that there are functional categories specific to the pivotal categories Ns and Vs, and that these categories cannot function in articulated discourse unless their projections are 'closed off' by functional categories; in the case of NPs and VPs, the categories D⁰, and I⁰, projecting DP and IP are obligatory; the reason is semantic, DPs and IPs (terms and sentences/propositions) are the *saturated expressions* at the interface of language and the world; terms (DPs) and sentences/propositions

(IPs/CPs) pick up referents in the extra-linguistic world: individuals, and true or false states of affairs.

There are other functional projections (e.g. Number Projections, Agreement Projections, Case Projections) that have been proposed in the analysis of various linguistic phenomena. It is·theoretically permissible for any inflectional affix (or morpho-syntactic feature) to be projected in syntax. But this possibility should materialize *only* when syntactic facts warrant this, that is, only *when there is evidence for a distinct syntactic position.*

11.1. An interesting class of grammatical words in English and other languages is the set of *degree words*, a limited set of adverbs like *so, enough, rather, too, very, fairly, that*, etc. in English or *atât (de), aşa (de), cam, prea*, etc. in Romanian.

These words are usually associated with adjecteves and adverbs, and it has been proposed to analyze them as functional heads that may license adjectival and adverbial phrases (cf. Abney (1987)).

(110) a. It is { very / fairly / so } good.

b. He runs { very / quite / so } fast.

c.
Deg'
Deg^0 — AP
so
rather   good

(Abney's proposal)

This proposal faces difficulties, because degree words differ from other functional heads in a number of ways. While I^0, D^0, C^0 uniquely select one type of complement (VP, NP, IP, respectively), degree words select not only the lexical category A (adjectives and adverbs) but also quantifier phrases. Quantifiers (*two, seven, many, few*, etc.) are a subset of the determiner class, which may function in D^0 licensing an NP complement, but may also occur below D^0, as noun specifiers: [[$_{D_0}$*two*] [$_{NP}$*books*]]$_{DP}$ / [$_{D_0}$*these*] [$_{NP}$ *two* [$_{N_0}$*books*]]]$_{DP}$ / [[$_{D_0}$ *many*] [$_{NP}$ *books*]] / [[$_{D_0}$ *the*] [$_{NP}$*many* [$_{N'}$ *books*]]]$_{DP}$. Some of the quantifiers, namely the lexical gradable ones (*many, much, for, little, few*), combine with degree words:

(111)   so few
        very many
        too much

Degree words thus select not only APs/AvPs but also QPs, they are in fact sensitive to the semantic property of *gradability.*

A second semantic fact is that they operate on unsaturated expressions and yield unsaturated expressions: *tall* designates the class of individuals in the positive

extension with respect to some comparison class; *very tall* also designates a set of individuals, a set which is a subset of the group designated by *tall* (in some context). The fact that they do not change the semantic category of the expression may explain two syntactic facts, which both characterize degree words in contrast with the functional categories discussed so far. First, degree words are "optional", i.e., adjectival phrases, quantifier phrases may occur in articulated discourse without being licensed by degree words:

(112)   He is (fairly) tall.
        There are (too) few of them.
        He is a worker / *He is worker.

Secondly, degree words may be iterated (not at random, naturally).

(113)   He is very, very slow. [Compare: *I see the, the body.]
        He is so very good.
        She is rather very smart.

These facts tend to suggest that the adjective/quantifier is the most important constituent both *formally* and semantically. As shown by Rothstein (1991), "degree words are functional heads with non-standard properties, namely, they select a variety of categories and the category of the node they project is determined by the category of the complement and not by the head itself". This means that $[[_{Deg^0}\ so]\ [_{A}\ fond\ of\ Mary]]_{A}$, $[so\ [very\ [fond\ of\ Mary]]]$ etc. could be viewed as APs rather than DegPs.

One last idiosyncratic property of degree words is that they license two complements; in addition to the AP / QP they may license degree clauses, whose presence and especially whose syntactic form is entirely determined by the choice of the degree head.

(114)   a. The coach is too incompetent for the team to win any game.
        b. This coach is so incompetent that no one will hire him.
        c. John is too stubborn to help / *that we can help him.
        d. Mary is so busy that I'll help her / *to help (her).
        e. *John was stubborn for us to help (him).

As the examples show *too* selects an infinitive, while *so* selects a *that* complement. These facts can best be handled by subcategorization.

(115)   too→[-AP⌒CP[-Tense]]
        so→[-AP⌒CP[+Tense]]

Incidentally, as pointed out by Rothstein (1991), this is another case where subcategorization cannot be eliminated in favour of any other mechanism of the grammar. These remarks on degree words were exploratory, and they simply show that more research is needed in this area.

11.2. Following Reuland (1987) we could arrange the syntactic categories into the following *open-ended* chart.

(116)

N	A	V	P	Det	Deg	Infl^0	Comp^0...
+N	0N	-N	-N	+N	0N	0N	+N
0V	0V	+V	0V	-V	0V	+V	0V
-F	-F	-F	-F	+F	+F	+F	+F

The chart shows the systematicity of a parts of speech system, UG allows the construction of a prototypical system, a kind of generative matrix; we expect similarities in the hierarchical projection of lexical parts of speech, with parametrized options in acknowledging subcategories of the major parts of speech (e.g. particles vs prepositions) and with parametrized choices at the level of functional categories.

12. The theory of head movement.

The discussion of parts of speech in this chapter has revealed the existence of an important category of movement rules: those involving the movement of a head constituent X^0 (a word, not a phrase); we have thus mentioned the movement of V^0 to I^0, the movement of the inflected verb $[V^0+I^0]_{I_0}$ to C^0, and the movement of the noun N^0 to the D^0 position (e.g. in Romanian, when D^0 is the definite article).

(117)

a.

```
            CP
      ____/  \____
  SpecC'         C'
           _____/  \_____
         C°              IP
              ____/  \____
            NP           I'
                   ____/  \____
                 I°            VP
                        ____/  \____
                      NP           VP
                                   V'
                              ___/  \___
                            V°          NP
```

b.

```
              DP
              D'
         ___/  \___
       D°          NP
       -L          N'
                   N°
```
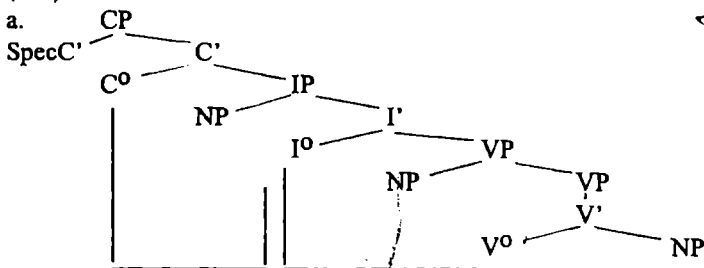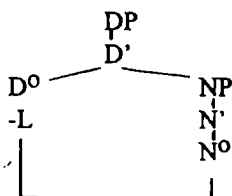
Moreover, head movement is subjected to the Head Movement Constraint.

(118) Head Movement Constraint (HMC)
An X^0 may only move into the head position Y^0 that properly governs it.

For our immediate purposes 'proper' government is simply government by a sister head X^0 (X=V,A,P,N,I) or government by a head Y^0 within the first projection of the head. The HMC is necessary to prevent the generation of examples like (119c) below:

(119) a. They could have acted more responsibly.
b. Could they have acted more responsibly?
c. *Have they could acted more responsibly.

d.

```
          CP
Spec ————————— C'
     C⁰ ————————— IP
          NP ———————— I'
                     I⁰ —————————— VP
              T    M    V⁰ ——————— VP
                                   V'
                              V⁰ ———————— AvP
         they   -ed  can  have  acted  more responsibly
```
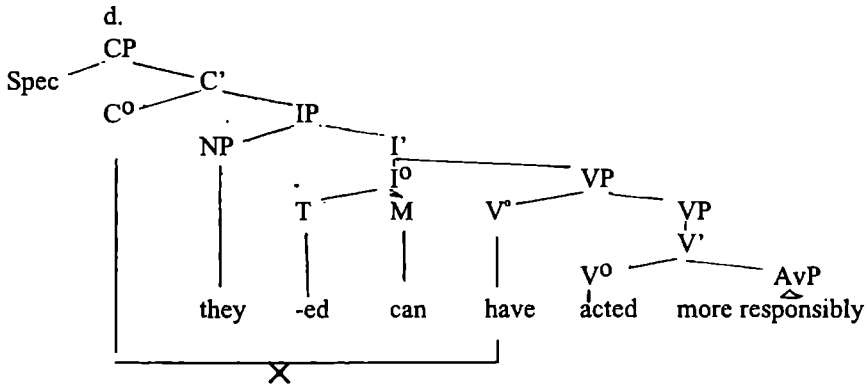
In (119c) *have* inadvertantly skips over the I^0 position; a V^0 element cannot directly go up to C^0; and in this particular case I^0 position already has a finite verb in it (*could*) so *have* must keep its initial position in V^0 (see (119d)).

12.1. It has been proved that the HMC is not an independent "rule" or principle of the grammar, but that it follows from the general requirement on traces that is known as the Empty Category Principle (ECP). The ECP (which will be extensively discussed in the chapter devoted to wh-Movement) is needed to explain the empirical fact that traces can only be found in certain positions in sentences, and only in particular configurations with respect to their antecedents. Speakers always "reconstruct" the initial position of a moved constituent, when they interpret or use sentences, but this is because there is a proper path connecting the moved constituent and its initial site, where the trace is. Adopting and adepting a formulation in Rizzi (1990: 74), we will state the ECP as follows:

(120) ECP:
A trace must be:
(i) properly head-governed (Formal licensing)
(ii) suitably identified

(121) Head government is defined as follows:
X head governs Y iff
(i) X is a head, i.e. $X \in \{A, N, P, V, Agr, T\}$.
(ii) X m-commands Y.
(iii) No barrier intervenes.
(iv) Minimality is respected (i.e. there is no closer governor).

Head government is the concept of government that we have been using all along. The term 'head' government rather than government aims at distinghuishing this relation from the relation of antecedent-government (a particular relation between an antecedent and its trace: the antecedent c-commands the trace and is coindexed with it. *Proper*-head government is head government in the first projection of the head.)

To understand the usefulness of the two conditions on traces, given in (120), namely licensing of the trace and identification, let us consider the following examples:

(122)   a. What$_i$ did he see t$_i$?
         b. * What$_i$ did he see a lake t$_i$?

(123)   a. At what time$_j$, did he ask t$_j$ what you bought t$_j$?
         b. ?What$_j$ did he ask where$_i$ you bought t$_j$ t$_i$?
         c. Where$_i$ did he ask t$_i$ what$_j$ you bought t$_j$?
         d. *Where$_i$ did he ask what$_j$ you bought t$_j$ t$_i$?

Question (122a) is we'l-formed; the trace is licensed by the verb *see*, which properly head governs the trace. In contrast, the trace in (122b) is not licensed, it has no lexical governor. Thus, the trace position has to be properly head governed. Moreover, the content of a trace has to be identified through its relation with the antecedent (the moved constiuent). Thus, in (123a) each trace is coindexed with one wh-word and is thus identified. Compare (123c) and (123d), both involving movement of an adjunct; *where* can only be interpreted as a main clause constituent, as in (123c), in (123d) the trace is in a position where it cannot be identified and the reading proposed in (123d) is ungrammatical.

In the case of DP movement, or rather whenever the moved XP is referential, the antecedent and the trace are coindexed; i.e. chain formation and identification are based on coreference. The features of the trace are retrieved by coreference with the antecedent.

Let us see how traces left behind by X^0 Movement, not by (referential) XP movement, can meet the requirement of the ECP.

(124)   a. He has come.
         b. Has he come?
         c.

d.
CP
Spec
C'
C^0
IP
I^0
NP
I'
Has
he
I^0
VP
t'$_v$
V^0
VP
t$_v$
come
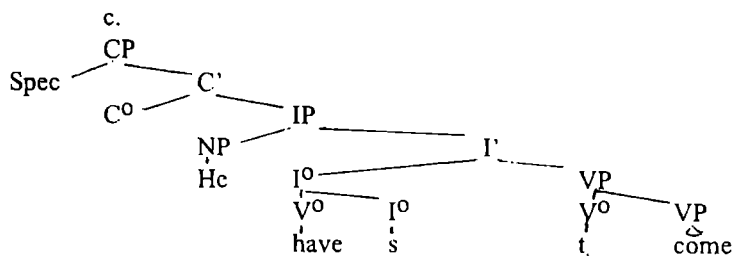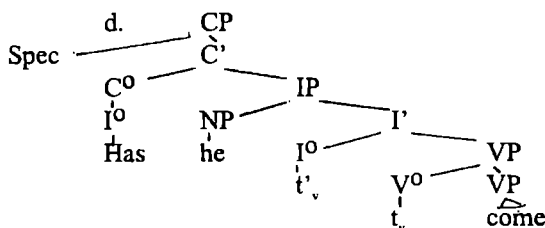
The traces in (124c, d) are properly head governed. Thus in (124c), I^0 f-selects its VP complement and governs its head position V^0 (in the first I' projection). The inflected verb in C^0 will then head govern the I^0 position in (124d). So head-to-head movement, as formulated in (118) will secure proper head government of the trace from the position where the antecedent moves. However, identification (i.e. retrieval of the features of the antecedent) is no longer possible through coreference (cf. Travis (1991)). The reason is that X^0 constituents (N^0 (*boy*), V^0(*run*), [V^0+I^0]I^0 (*runs*) etc.) are not *referential*. Unlike NPs, they do not designate individuals.

A different mechanism of *identification* is needed, a mechanism whereby a head may transmit features to a head that it properly governs. This mechanism has simply been called "Head-feature transmission"(cf. Travis (1991)). Since moved X^0 constituents do not leave behind coindexed traces, trace identification is based on head feature transmission:

(125) <u>Restriction on head feature transmission.</u>
Head features may only be transmited from a head to its sister.

Head feature transmission is involved not only in the identification of traces, but also in the identification of base generated empty heads, as well as in case of Affix Hopping, case assignment, a.o. Here is an example, involving feature transmission in Affix Hopping and Case Assignment.

(126)
VP
V^0
VP[past prt]
have[+past prt]
V^0[past prt]
VP [present prt]
beEN[+present prt]
V^0[present prt]
DP[+Acc]
watchING[+Acc]
D^0
[+masc]
[+3 person]
[+Acc   ]
him
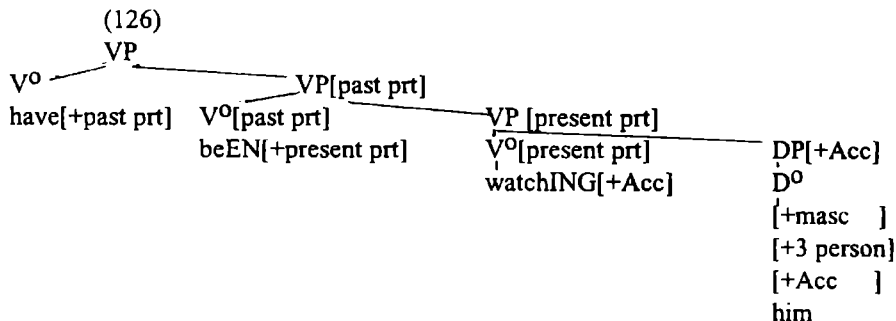
In the structure of (126), features are always transmitted from a head A to a head B, whose maximal projection is sister to A. The features percolate down from a

head to its sister complement (the maximal projection) and then down to the head of the complement. If features may be transmitted only in this way, then an antecedent in a head position can only identify the trace left behind in the head position of its complement. Feature transmission, and, by this means, identification of the trace are possible if the antecedent moves from one position to the next. But this is precisely the content of the HMC.

In this section we have shown that the Head Movement Constraint is a consequence of applying the Empty Category Principle in the particular case of X^0 constituents.

In the remaining of this chapter we will offer an illustration of head movement in Germanic languages: the Verb Second (=V2) phenomenon.

12.2..The V2 phenomenon is one of the most characteristic syntactic properties of the Germanic languages. The reason why we mention it here is not only because this phenomenon provides an excellent example of V Movement, but also beacuse it offers persuasive evidence in favour of the CP / IP sentence analysis that has been introduced in this chapter.The literature on the subject is literally enormous[see, for instance, den Besten (1977), Holmberg and Platzack (1988), Weerman (1988), Vikner (1991), as well as the references cited there].

Verb second (V2) is the movement of the *finite* verb to the second position of the clause, as seen, for example, in qustions in all the Germanic languages, and in most other main (root) clauses in the Germanic languages, except English.The finite verb follows the first constituent, whatever this constituent is:

(127) a   English   What has Peter seen ?
       b.   Danish   Hvad har Peter last
       c.   German   Was hat Peter gelesen ?

(128) a.   English   *This book has Peter read.
       b.   Danish   Denne bog har Peter laest.
       c.   German   Dieses Buch hat Peter gelesen.

It is assumed that, prior to moving to Comp, the highest (finite) verb raises to Inflection, by V-to -I Movement, in some of the Germanic languages. As remarked by Vikner(1991), "Due to the effect of verb second (and of the SOV order of German, Dutch and Frisian), this can only be clearly observed in embedded clauses in the SVO languages, where the finite verb either precedes or follows an adverb or negation." If the order is Verb + adverbial / negation , there is V^0 ¯to-I^0, if the order is adverbial + verb ther is not.Compare Icelandic to Danish, on this point. Movement to Inflection is clealy visible in the Icelandic embedded clause example(129a), where the verb + negation word order indicates verb-movement. In Danish, negation + verb order is correct (example (129d)).

(129)   a.   Icelandic   Eg fer [ef hann kemur ekki]
        b.   Danish   *Jeg gar[hvis han kommer ikke]
                               I go   if he   comes not
        c.   Icelandic   *Eg fer [ef hann ekki kemur]
        d.   Danish   Jeg gar [hvis han ikke kommer]
                               I   go   [if he not comes]

The V2 second phenomenon occurs in OV languages (German, Dutch), as well as in VO languages (Danish, Swedish). English has lost most of its V2 patterns (hence the star on (128a), and currently only shows "residual V2" in questions and in certain emphatic constructions with Inversion (*Never had he seen such beauty before.*))

As already mentioned, everywhere in Germanic root clauses the finite verb is, demonstrably, in C⁰ position, so that the apparent similarity between the following three sentences is merely a "phonetic illusion", as commented by Vikner (1991):

(130)   English The children saw the film.
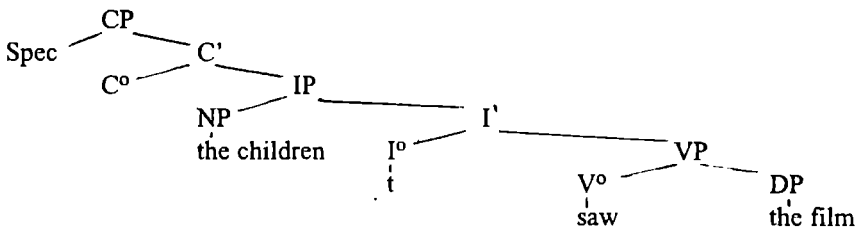
(131)   Danish   Bornene sa filmen.
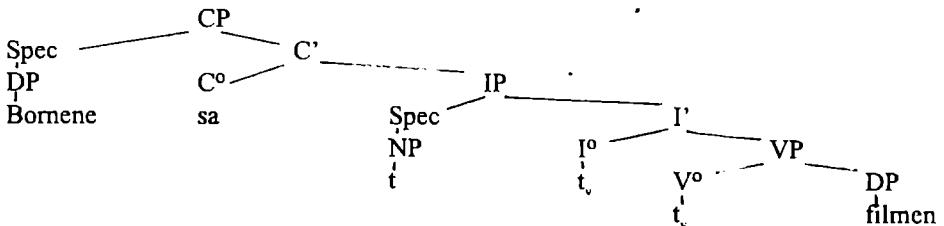
(132)   German Die Kinder sahen den Film.
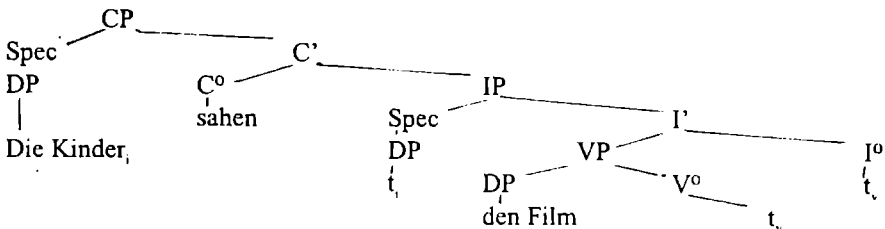
There are two basic differences between the sentences above, having to do with the head parameter, and with the presence or absence of V2. English and Danish are SVO, while German is SOV. German and Danish are V2 languages, while English is not. It is maintained that in the V2 patterns, the finite verb moves to Co.

We now briefly review some properties of V2 languages, which can be adequately described under the hypothesis that the finite verb in sentences with no overt complementizer occurs in the position in which a complementizer occurs, when it is overtly present.

In OV languages, there is a clear contrast between root clauses, where the verb occurs in second position, and embedded clauses, where it is sentence-final (examples(133)). This clearly shows that there is V - Movement in root clauses. Secondly, in both OV and VO languages, there is *complementary distribution* between complementizers and finite verbs, noticeable both by comparing root and embedded clauses, and by examining those verbs that allow V2 in their embedded clauses (examples (134, 135)). This complementary distribution has been interpreted as an indication that the finite verb prevents the occurrence of the complemetizer, occupying its position. Moreover, in declarative clauses, if the verb shows up in C^o one other constituent (the object in (134b, 135b) and the subject in (134d) is topicalized, appearing in Spec C', so that the verb occurs in second position, while a lexical Complementizer is sentence-intial.

(133)   Ge.   a.Diesen Film <u>haben</u> die Kinder gesehen.
                b.Er sagt, [dass die Kinder diesen Film gesehen <u>haben</u>]

(134)   Ge   a.Er sagt, [<u>dass</u> [die Kinder diesen Film gesehen <u>haben</u>]
                He says that the children this film seen have
                b.Er sagt, [diesen Film <u>haben</u> [die Kinder gesehen]]
                He says this film have the children seen
                c.Er sagt, [<u>dass</u> [die Kinder diesen Film gesehen <u>haben</u>]]
                He says that the children this film seen have
                d.Er sagt, [die Kinder <u>haben</u> [diesen Film gesehen]]
                He says the children have this film seen

(135)   Da   a.Han siger [at [bornene <u>har</u> set denne film]]
         ·   b.Han siger [denne film <u>har</u> [bornene set]]

Another kind of supporting evidence, this time also valid for English, comes from conditional clauses, where two versions are allowed, one headed by the complementizer *if*, the other headed by the finite verb that has moved to Comp. Again the finite verb and the complementizer are in complementary distribution:

(136)   Ge   a.Wenn ich mehr Zeit gehabt <u>hätte</u>,...
         E   b.If I <u>had</u> had more time

(137) Ge   a. <u>Hätte</u> ich mehr Zeit gehabt
       E.   b.<u>Had </u>I had more time.

It may be less than clear at first sight that in VO / OV root clauses when the verb shows up *after* the subject, the verb is in C^o, not in I^o (as claimed , for instance by Travis (1991)). The crucial remark here is that in any root clauses of V2 languages only one constituent may occur left of the verb. Nothing can precede the subject in (139), although adverbials may precede the subject in English, a non-V2 language (examples (138). The position left of the verb, is thus the unique leftmost position in clause structure, and this position is Spec C'. Topicalization in V2 languages must be viewed as Movement to SpecC', entailing movement of the verb to C^o. In contrast, in English, topicalized constituents may also be adjoined to IP. Compare:

(138) E.   The children saw the film yesterday.
             Yesterday, the children saw the film.
             *Yesterday saw the children the film,

(139) G.   Die Kinder sahen diesen Film gestern.
             *Gestern die Kinder sahen diesen Film.
             Gestern haben die Kinder diesen Film gesehen.

In sum, the different properties reviewed above justify the analysis of V2 as movement of the finite verb to the complementizer position. At the same time, the unique phrasal constituent preceding the verb, occurring in sentence-initial position, is assumed to occupy the unique Spec C' position. The proposed clause structure provides an adequate descriptive mechanism for the V2 phenomenon.

Chapter 9

REFERENTIAL RELATIONS IN GRAMMAR (I)

BINDING THEORY

1. Preliminaries on reference.

On one important acceptation of the term, reference or denotation is a semantic relation that holds between a *language* and a *referent*. Language is about something, a word is a sign for something, a conception which is very distinctly expressed in Ogden and Richards' view of the linguistic sign, shown in (1). The sign as material representation sends to a concept; this is supposed to be a causal relation, and the concept, likewise causally, sends to an object or referent. The relation between words and objects is mediated by *concepts*. It is this relation between words and objects that is called *reference*. For instance, the NP *Noam* denotes the individual called Noam, the NP *the president of the US* refers to the unique individual, who is the president of the US at any one time.

(1)   concept

object-------------------word
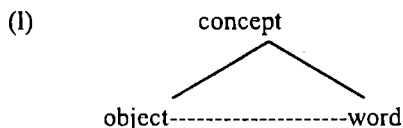
As already discussed, other types of expressions denote other types of entities than unique individuals. For instance, one-place predicates like *sleep, red, horse* denote property-sets, e.g., the sets of individuals denoted by the properties of being asleep, being red and being a horse. Sentences like *Bill is asleep* refer to states of affairs which may be true or false. It appears that the referents of NPs, that is, unique, particular individuals, have ontological priority, because the referents of other expressions are objects constructed out of individuals.

The reference of words is actualized in *reference acts,* in the sense that people use words (language) to refer to things. For instance, although *the window* may hardly be said to pick up a unique referent, in a particular situation, *in a given context of use*, a speaker may avail himself of this phrase to refer to the unique window which is *salient* in that particular situation.

Reference, therefore, is not a matter of grammar or *syntax*; it is a matter of semantics and pragmatics. The distinction between syntax, semantics and pragmatics as branches of semiotics (cf. Morris (1971), Carnap (1947)) is probably familiar: syntax is the study of relations between signs (distributional relations), semantics deals with relations between signs and objects (therefore, it is concerned with the problem

of reference), while pragmatics deals with relations between signs, objects and users. Reference and referential acts are part of semantic and pragmatic study. Although, as already mentioned, all designators (terms, predicates, sentences) have extralinguistic referents, for the purposes of syntactic description, it is especially NP reference that counts.

1.1. A moment's thought on the way NPs pick up a referent will immediately show that not all NPs are alike, in the way that they establish a referential relation. For instance, personal pronouns, or the class of those NPs that have been labelled *"epithets"* (Lakoff (1968) may (indirectly) pick up an extralinguistic referent by means of an antecedent NP, with which they share the referent.

(2)   a. Penelope cursed Peter, and slandered him; (pronoun).
              b. Mary kicked Fat Max when the bastard insulted her (epithet).

Syntax is interested precisely in *relations of coreference*. There are configurations where the relation antecedent-pronoun is possible, therefore, *coreference is allowed*, and there are situations where coreference between a pronoun and an NP is impossible, so that the pronoun and the NP must have *disjoint* reference.

(3)   a.Nixon$_i$ didn't have any money about him$_i$. (obligatory coreference)
              b.Nixon$_i$ is not disturbed that he$_{i,j}$ is unpopular. (possible coreference, *he* may refer to Nixon or to some other person)
              c.*He$_i$ is not disturbed that Nixon$_i$ is unpopular. (disjoint reference, *he* may not refer to Nixon).

A first thing that needs to be understood·is that not all pronouns may contract the syntagmatic relation antecedent NP-pronoun. The category of pronouns as a distributional class is set up paradigmatically. Pronouns are elements that share most (if not all) of the privileges of occurrence of NPs.

(4)   a.   The man/He/Who/Everybody/Nobody/This is here.
           b.   I rely on this man/him/everybody/nobody.

Generally speaking, coreference relations hold between those NPs and those pronouns that designate unique, particular individuals: *proper names, definite descriptions* (NPs headed by the definite article or by a demonstrative, e.g., *the King of France*), *personal and possessive pronouns, reflexive and reciprocal pronouns.* All of these are called *singular terms*, i.e., designators whose referent is a particular individual.

Singular terms and non-terms are conveniently kept apart by a number of inferential tests, whose validity depends on the term's picking up a well-defined particular individual. Let us examine these tests, which oppose *singular terms* and *quantifier phrases*.

a) Existential generalization is an inference which relates terms and existential quantifiers, by saying that if some term t (in fact, some term designated individual) has some property P, therefore, if one can assert that 't is P', or P(t), then one is entitled to assert that there is somebody that has property P, or $\exists x P(x)$, as in the following example:

(5) a. Alice walks faster than you. P(t)
    b. Somebody walks faster than you. ∃xPx

This test may show that *nobody* (and also *no man, no boy,* etc.) is not a term; it does not denote an individual, therefore, from (6a) it is not possible to conclude (6b):

(6) a. Nobody walks faster than you.
    b. Somebody walks faster than you.

b) In the case of singular terms, when a conjunction of two sentences $P_1(t)$ and $P_2(t)$ is asserted about some t, it is possible to infer that there is some individual that is both P_1 and P_2. This inference, whose validity for singular terms can be seen in (7), fails for indefinite pronouns like *someone/something,* which are existential quantifiers.

(7) a. John met Jane at the reception and Susan also met Jane at the reception.
    b. There is someone that John and Susan met at the reception.
(8) a. John met someone at the opera and Susan met someone at the opera.
    b. There is someone that John and Susan met at the opera.

c) A third typical inference for individual expressions is that from a premise of type 'It is true of t that $P_1(t)$ or $P_2(t)$' to '$P_1(t)$ or $P_2(t)$'. This inference rightly excludes the indefinite pronouns *everything/everybody* (and phrases like *every woman, every boy* etc.) from the category of terms. Compare the valid inference (9), involving the individual expression *John,* and the invalid inference (10), where the universal quantifier has replaced the term:

(9) a. It is true of John that he is either a doctor or an engineer.
    b. John is a doctor or he is an engineer.

(10) a. It is true of everybody in this class that he is a student or he is a musician.
     b. Everybody is a student or everybody is a musician.

Thus, these criteria (cf. Dummet (1973)) successfully manage to distinguish between *individual expressions and quantifiers,* within the syntactic category of NPs. Terms refer to particular individuals, quantifiers refer to the size of a set; if we take the set of mortals, 'x is mortal', then *Everybody is mortal* says that all the individuals in the set are mortal, i.e., ∀x(x is mortal), in other words, 'mortality' has the second order attribute of being a universal property; similarly, *Nobody is immortal* says that there is no individual x that is immortal, ~ ∃x(x is immortal), i.e., the property of immortality is not instantiated. Quanifiers bind variables and express properties of sets. Quantifiers do not establish coreference relations with antecedents. Notice that personal pronouns and reflexives may function as bound variables with respect to quantifier phrases:

(11)   a.   No prudent man will drive when <u>he</u> is drunk.

            b.   Everyone in this class admires <u>himself.</u>

            c.   Arthur Smith drove while <u>he</u> was drunk and got killed.

Thus, while in (11c), *he* refers to the particular person Arthur Smith, in (11a), *he* refers to no particular person; it is simply a syntactic place holder, a variable bound by the negative quantifier phrase *no prudent man*.

We retain that indefinite pronouns (and NPs headed by indefinite determiners like *every, no, some, all, many*, a.o.) semantically act as quantifiers, and that they do not establish syntagmatic coreference relations with other NPs.

The class of quantifiers also includes interrogative and relative pronouns:, *who what, which*. Semantically, they are best viewed as class/property forming operators. Intuitively, while the sentence *Noam is smart* expresses the proposition that Noam is smart, the relative clause *who is smart* expresses the property of being smart, or denotes the class of individuals who are smart; *who* acts on a sentence that has a free variable, e.g., 'he is smart' or 'x is P', and turns this into a class/property expression, *who is smart*, or 'who is P', designating the set of those x's that are P, i.e., $\lambda x(x$ is P). Relative and interrogative pronouns bind variables and take scope over sentences. The property/class designated by a *wh*-pronoun is then predicated of the antecedent in a relative clause construction, or of the expected answer in an interrogative construction.

(12)   a. Mozart, who is a perfect embodiment of a genius, is my favourite composer.

           b. 'Who is your favourite composer?' 'Mozart'

Sentence (12a) says that the property of being a perfect embodiment of a genius can be attributed to Mozart, or that Mozart is in the class of those individuals who are perfect embodiments of the idea of a genius; the question/answer pair in (12b) attributes to Mozart the property of being my favourite composer. Therefore, wh-pronouns are also quantifiers, logical binders of variables that take sentence scope.

2. Binding.

One module of the grammar is concerned with coreference relations within sentences, relations established between (overt) pronouns and antecedent NPs, relations which *involve singular terms*. This is the Binding module. Binding theory defines the syntactic domains where a pronoun may, must or cannot have an antecedent. From the point of view of their referential potential, NPs fall into the following categories:

      a. *anaphors* (reflexive and reciprocal pronouns) - anaphors cannot function in the absence of an antecedent. If an anaphor is used in a sentence, and there is no appropriate antecedent, the sentence is simply ill-formed:

(13)   *Themselves came late.

          *Each other are in love.

b. *pronouns* - personal pronouns are full referential expressions. They may directly send to a referent in a context: *He is my brother* (with pointing gesture). Syntactically, too, they do not need antecedents for well-formedness. The only thing syntactic theory should specifiy for them are the environments, where coreference relations are not allowed within a sentece with several NPs. For instance, in (14) below, coreference is prohibited.

(14)   a.   They$_i$ saw them$_{*i/j}$.

        b.   *Near Dan$_j$, he$_i$ saw a snake .

In (14a), *them* cannot be interpreted as designating the same group of people as the subject *they* ; similarly, in (14b), *Dan* and *he* cannot refer to the same individual, but must have disjoint reference.

c. *lexical* NPs refer intrinsically, and their reference is not restricted by syntactic principles: *The English in the end defeated the French.* There are, however, certain categories of NPs which behave more or less like pronouns in showing different degrees of anaphoricity (see (2b) above), but this does not invalidate the general point.

   2.1.Principles of Binding Theory. The LGB account of Binding Theory (=BT) introduces the important concepts of *binding* and *governing category* defined as follows:

(15) Binding:

α binds ß iff,

a. α c-commands ß;

b. α is coindexed with ß.

Binding defines a coreference relation between an element ß and a c-commanding antecedent α.

(16) Governing Category.

γ is the governing category for ß, if it is the smallest projection which includes ß, a governor of ß and a SUBJECT accessible to ß.

"SUBJECT" is a more technical term, which refers to "the most prominent nominal" in a given domain; this is: a) the subject in a non-finite clause, b) finite Inflection, that is, I^o[+Agr] (or the subject) in a finite clause, and c) the Genitive in specifier position in an NP domain (cf. John's love for *himself*). The usefulness of the concept SUBJECT will be seen below:

(17) Accessibility.

A SUBJECT α, and in general some NP, α , is said to be accessible to ß, iff ß is in the c-command domain of α, and coindexing of (α ,ß) does not violate any principles of the grammar.

More specifically, coindexing should not violate the i-within-i Condition, which prohibits the coindexation of one NP with a second one contained in it. The i-within-i condition holds for a variety of cases like those in (18), and its general form is (19).

(18) *[$_{NP}$ the friends of [$_{NP}$ each other$_i$]]$_i$
        *[$_{NP}$ the friends of [their parents$_i$]]$_i$

(19) *[.....δ$_i$ ...]$_i$

The relevance of the i-within-i Condition for accessibility and binding will appear in the discussion of Binding and Control.

The theory of Binding,(summarized in (20) below), states three general *conditions* on the employment of anaphors, pronouns and lexical NPs:

(20) Binding Theory:

Condition. A. An anaphor is bound in its governing category (i.e. an anaphor must have an antecedent in its governing category).

Condition. B. A pronominal is free in its governing category (i.e., a pronoun · should not have an antecedent in its governing category; a pronoun should lack a c-commanding antecedent in its governing category).

Condition. C. An R expression (a full NP) is referentially free (i.e., it should lack an asntecedent in any category.

3. On the interpretation of anaphors and pronouns.

Principles A and B are formulated so as to account for the basic complementarity of pronouns and anaphors apparent in core pairs of examples like the following:

(21)   a. [John$_i$ saw himself$_i$ in the mirror.]
        b. [John$_i$ saw him$_{j/i*}$ in the mirror.]
        c. [[The members of the team]$_i$ admire each other$_i$]$_{IP}$
        d. [[The members of the team]$_i$ admire them$_{j/i*}$]

In (21a), the governing category (GC) for the reflexive anaphor *himself* is the clause (=IP), since it is the minimal maximal projection containing the governor of the anaphor; i.e., the V, and a SUBJECT accessible to it, which is finite Infl (+Agr) (or the subject of the sentence; since the two are coindexed, it does not matter which of them is chosen to define the binding domain for the anaphor).

Condition A says that within the domain defined by the GC, the anaphor must have an antecedent. The subject of the sentence is the required antecedent; it is in the appropriate domain and it c-commands the anaphor, therefore, it can bind it (i.e., coindex it). The same analysis applies to (21c); the reciprocal anaphor's GC is the clause; within this domain, the anaphor can be bound by the subject which c-commands it.

Consider (21b,d) now; the GC for the pronoun is again the minimal X^{max} which contains the governor of the pronoun, i.e., the verb, and also an accessible SUBJECT, i.e. finite Inflection (or the subject of the sentence); the GC is thus the clause; the pronoun must be free in this domain, and indeed, we cannot understand the pronouns in (21b,d) as coreferential with the subject; the different referential index on the pronoun shows obligatory disjoint reference in this case. To understand the role of Inflection in binding phrases in English, let us examine the following examples:

(22)   a.   *John$_i$ believes [that [himself$_i$ is$_i$ smart]$_{IP}$]$_{CP}$
          b.   John$_i$ believes [himself$_i$ to be smart]$_{IP}$

The GC of the reflexive anaphor *himself* in (22a) is the embedded clause, since it contains finite Inflection [I^O[+ Agr]] which is a governor of the subject (it m-commands it) and which is also an accessible SUBJECT for the anaphor. Indeed, the coindexation of the subject with Inflection [+ Agr] is obligatory for Nominative assignment (by Spec-Head Agreement). Finite Inflection, thus, defines a GC, a binding domain, namely, the subordinate clause, inside of which the anaphor ought to have a c-commanding antecedent, but fails to have one; condition A is violated and the sentence is ungrammatical. Notice also, that Agr in Inflection may be an accessible SUBJECT. (i.e., it may define a binding domain), but it cannot be an antecedent (a binder) of the subject. The binding antecedent of an anaphor should be an *argument; anaphors must be A-bound* (bound from argument positions) and Inflection is not an argument.

Consider now the minimally distinct (22b): the subordinate clause is an IP, not a CP; moreover, it is a *non-finite* infinitive clause. The non-finite Inflection, TO, does not count as an accessible SUBJECT; let us try to determine the GC for the subject of the infinitive clause: the nearest governor of the infinitive subject is the main verb *believes*, which assigns it case, and the nearest accessible SUBJECT is the finite I^O; the GC of the subordinate clause subject is the main clause in this case; in this binding domain, the anaphor *himself* is properly bound by the main clause subject *John*, which is a c-commanding antecedent, and the sentence is well-formed.

If the anaphors are replaced by pronouns in (21), both sentences become acceptable, but there are differences in the interpretation of the pronouns:

(23)   a.   John$_i$ believes [that [he$_{i/j}$ is honest]$_{IP}$]$_{CP}$
          b.   John$_i$ believes [him$_{*i/j}$ to be honest]$_{IP}$

In (23b), there must be *disjoint reference* between the main clause subject and the subject of the infinitive, while in (23a), coreference of the two subjects is possible, but not obligatory. These differences follow from Principle B. In (23a), the GC of the pronoun is the embedded clause (IP), since Inflection is finite and counts as a governor and an accessible SUBJECT. Principle B says that the pronoun should not have an antecedent in the embedded clause, and this is indeed the case; the pronoun is free to pick up an antecedent somewhere else in the context; e.g., it may be coreferential with the main clause subject. In (23b), since the embedded clause has non-finite inflection (TO), the GC of the pronoun is the main clause; and Principle B prevents the pronoun from being coreferential with any (c-commanding) argument in this domain; coreference of the two subjects is forbidden.

The examples below show that the *subject of a non-finite clause* may define a *binding domain for an anaphor in object position:*

(24)   a.   They believe [Mary$_i$ to admire herself$_i$]$_{IP}$

         b,   *They$_i$ believe [Mary to admire each other$_i$]$_{IP}$

         c.   They$_i$ believe [Mary to admire them$_{*i/j}$]$_{IP}$

The GC for an anaphor or a pronoun in object position in the infinitive clause is the infinitive clause itself, since it is the minimal X^{max} containing the governor of the anaphor/pronoun, which is obviously the verb, and also an accessible SUBJECT, which is the subject of the infinitive clause. The subject of the non-finite clause defines a binding domain within which an anaphor must be bound and a pronoun cannot be bound. Therefore, (24a) is well-formed, since the subject *Mary* is a c-commanding antecedent for the anaphor *herself*, inside the GC, which is the infinitive clause; (24b) is ill-formed, since there is no antecedent for *each other* in the infinitive clause; and the main clause subject is outside the GC, and cannot be an antecedent; in (24c), a pronoun *them* can be used, since it is free in its GC; it has no antecedent in the infinitive clause, and it may optionally be coreferent with the main clause subject.

    3.1.Having examined the major examples of the IP paradigm, it is now possible to investigate the DP/NP paradigm. A Genitive in determiner position(actually in SpecDP, as shown in the previous chpater), which may correspond to the subject of an active sentence in English (*John's performance of the sonata/John performed the sonata*), is usually referred to as the "subject" of the nominal phrase, and, as the examples below show, it can also function as a SUBJECT for binding:

(25)   a.   Mary's knowledge of herself

         b.   Mary's pride of herself

         c.   their admiration for each other

         d.   their love of/for each other

         e.   their interest in each other

    As long as the DP has a SUBJECT, i.e., a Genitive in SpecDPposition, the DP counts as a governing category for any noun complement. If the DP has no SUBJECT, the whole clause containing the DP will count as a GC (since it will contain a governor of the NP, the noun + preposition (see below), and a SUBJECT, i.e., the main clause subject or Inflection). This can be seen in (26), where the anaphor is bound by the main clause subject:

(26)   a.   They$_i$ expressed interest in each other$_i$.

         b.   They$_i$ bought pictures of each other$_i$.

(27)   a.   *They liked Mary's picture of each other.

         b.   They liked Mary's picture of them.

    The example in (27a) shows that an anaphor *inside* an DP cannot be bound from outside the DP, if the DP has a subject of its own. Finally, as expected, the subject of an DP (i.e., the Genitive in SpecDP) has the clause as GC (see example (28)):

(28)   a.   They$_i$ value each other$_i$'s love.

          b.   They$_i$ bought each other$_i$'s pictures.

We are now in a position to account for the contrast in (29) below.

(29)   a.   *We expect [$_{CP}$ that [$_{IP}$ each other$_k$ will$_k$ win]]

          b.   We expect each other to win.

          c.   They$_i$ expect [$_{CP}$ that[$_{IP}$[[each other$_i$'s] books]$_k$ will$_k$ receive good reviews]].

It has already been explained why (29a)(similar to (22a) is ruled out: finite Inflection (=*will*) counts as a governor and accessible SUBJECT for the subject, which is coindexed with finite Inflection, under Spec-Head agreement; in (29a), although the GC of the reciprocal subject is the subordinate clause, the anaphor has no antecedent in this domain, in violation of principle A; this is why (29a) is ill-formed.

But then, why is it possible to bind the reciprocal from outside the embedded finite clause in (29c)? The answer is that the finite Inflection (*will*) of the complement clause does not count as an accessible subject for the Genitive phrase. Inflection *will* is coindexed with the whole subject phrase [[each other$_i$'s] books]$_k$ will$_k$, and the i-within-i condition does not allow a subpart of this phrase, namely, the Genitive phrase, to have the same index as the whole phrase. So the Genitive phrase will "look for" the next SUBJECT up, and this is the SUBJECT of the main clause. The GC for the reciprocal anaphor is the main clause, and the anaphor is bound in this domain by the main clause subject (which is a c-commanding antecedent). These examples bring out the relevance of the i-within-i condition, and allow making the specification that (in a finite clause) finite Inflection must count as an accessible SUBJECT only for a subject that can be coindexed with it. For object arguments, the subject rather than Inflection may count as SUBJECT.

In sum, Principles A and B give a good account of the basic relation of complementarity in the basic distribution of anaphors and pronouns.

3.2. Principle C claims that, while pronouns may have a c-commanding antecedent outside their GC, full DPs are intrinsically referential and should not have a c-commanding antecedent at all. Compare:

(30)   a.   John$_i$ said that he$_{i/j}$ had seen Mary on that day.

          b.   *He$_i$ said that John$_i$ had seen Mary on that day.

Like the pronoun *he* in (30a), the referential expression *John* in (30b) is free in its GC (=the embedded clause); nevertheless, sentence (30b) is ill-formed, since the proper name cannot have a c-commanding antecedent in any domain.

It has been suggested (cf. Koster (1987)) that Principle C should be viewed as a principle of discourse, rather than as a matter of configurational syntax; and, there are good grounds for defending such a view. The syntactic relevance of Condition C will be apparent in the discussion of Wh-Movement.

4. Locality principles and the parametrization of the Binding Conditions.
In the years that have elapsed since the publication of LGB, a lot of research has been done on binding phenomena; the consideration of a wider range of data from different languages enriched the typology of *anaphors* and led to a more flexible parametrized formulation of BT.

We merely want to illustrate some of the results that have been obtained and the parameters of variation in the domain of Binding. Since Principle B is a negative condition saying where pronouns should not be used, it can be viewed as a derived, elsewhere condition (cf. Koster 1987); research has understandably concentrated on a proper formulation of Principle A.

4.1. Most researchers (cf. Bouchard (1984), Aoun (1985), Koster (1984,1987), Manzini (1992)) insist that the relation R between an anaphor and an antecedent is one of *strong dependency*, having the following properties (cf. Koster 1984: 429 ff):

a. Obligatoriness. Reflexives *must* have antecedents, whereas personal pronouns can remain unbound (or even must remain unbound).

(31)   a.   *I saw himself.
     b.   I saw him.
     c.   He$_i$ saw himself$_i$.
     d.   He$_i$ saw him$_j$.

b. Uniqueness of the antecedent α. Personal pronouns allow 'split antecedents', i.e., two non-coordinated NPs may function as the 'antecedent' of the pronoun.

(32)   John$_i$ told Peter$_j$ that Mary$_k$ hated them$_{ij}$.

Them can be coreferential with both *John* and *Peter.* This is not possible for reflexives. In the example below, the reflexive may be bound by either of the preceding arguments, but not by both, and this is why the plural form is not possible.

(33)   Bill talked to George about himself/*themselves.

c. Prominence. It is generally assumed that antecedents c-command the anaphors they bind.

(34)   a.   John is proud of himself.
     b.   *[The mother of John] hates himself.

In (34a), *John* properly c-commands *himself*; in (34b) the c-command condition is not met and the sentence is ill-formed. Personal pronouns can be coreferential with "antecedents" that do not c-command them.

(35)   a.   [The mother of John] hates him.

d. Locality. The antecedent and the anaphor should both be in a fairly local domain, which in Chomskyan theory was the governing category, i.e., a configuration which included the anaphor and its governors.

Dependencies of this type are typical of core grammar and on close scrutiny, characterize a variety of unrelated constructions. For instance, the same cluster of properties is characteristic of structural case assignment. Case assignment was obligatory to satisfy the Case Filter; there was a unique case-assigner which c-commanded and governed the case-assigned NP.

Notice that both case assignments and the antecedent anaphor relation rely on the *same minimal configuration: a matrix which includes the dependent element and its governor*. We might factor out the definition of governing category into the following components: a) the minimal configuration (i.e., the smallest X^{max} which contains the anaphor and its governor); b) one more factor, which further delimits the boundary of the antecedent-anaphor relation, and which Koster (1984, 1987) calls an "opacity factor". In the case of English, the opacity factor was the accessible SUBJECT, that is, the subject in conjunction with finite Inflection.

This analysis of the concept 'governing category' allows a parametrized statement of Principle A. We retain principle (36) and will vary the definition of governing categories for anaphors of different languages

(36) Condition A
An anaphor must be bound in its governing category.

Moreover, GCs themselves do not vary at random; it is only the opacity factor(s) which can be different; the local domain containing the anaphor and its governor is an obligatory structure of the GC. The opacity factors themselves form a hierarchy, ranging from those opacity factors defining very narrow domains to more permissive ones (cf. Wexler and Manzini (1987)). The examination of cross-linguistic data will immediately reveal the necessity of a parametrized definition of GCs.

4.1. In fact, although English has a fairly restricted Binding domain, it is by no means a minimal Binding domain. As suggested by Koster (1987), a minimal domain would specifiy no opacity factor and it will be identical with the first maximal projection containing the anaphor and its governor, i.e., the VP. This domain accurately describes the distribution of the *anaphoric clitics* in languages like French or Romanian. These are always bound by the subject of the clause, and can never occur in PPs, APs, NPs, where other pronouns have to be used.

(37) Romanian   a. El$_i$ se$_i$ spală [e$_i$].
                b. El$_i$ își cumpără mănuși [e$_i$].
                c. *El e mândru de se.
                  El$_i$ este mândru de sine/de el însuși.
                d. *iubirea lui de se
                  iubirea lui de sine/pentru el însuși.
    French   Il se lave [e].
                  *Il parle de se.
                  Il parle de lui-même.

(38) English   a. He$_i$ washes himself$_i$.
                b. He$_i$ buys himself$_i$ gloves.
                c. He$_i$ is proud of himself$_i$.
                d. his love for himself

If we accept the VP internal subject hypothesis, the GC of Romanian and French anaphoric clitics can be described as the VP, since the subject in the D-Structure of examples (37), c-commands the DO and IO positions, as can be noticed in (39)

English represents a significant extension of the GC in comparison with French or Romanian. In English, anaphors are regularly allowed inside governed and subcategorized PPs (see the English examples in (38 c,d)). It is as if the governing domains of Vs, As, Ns subsume that of the PP.

(39)
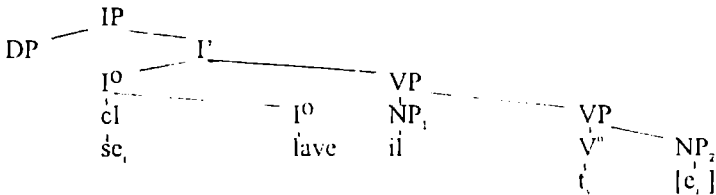
(40)
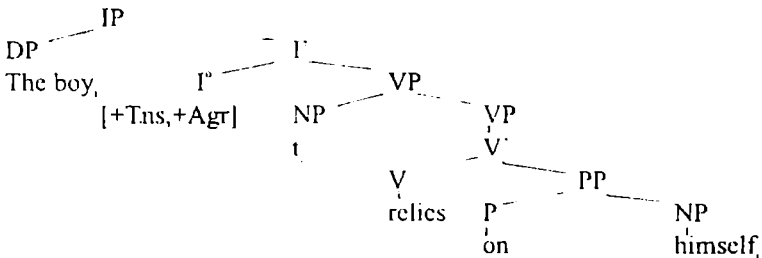
We have already mentioned that in English, *subcategorized* prepositions may be reanalysed with verbs, so that the verb "inherits" the governing domain of the P, and the object of the P is governed by V+P. Reanalysis was the manifestation of a relation between lexical heads (X^0), where one head (e.g., the P in (40)) is the complement of the other (the V in (40)). Reanalysis of X^0 categories may be accompanied by Head-to-Head movement (i.e., adjunction of one head to the other), or even by morphological incorporation (cf.Baker ,1988). Koster (1987) speaks of a more general property of *successive governors*, which he calls *dynasty formation*.

(41) "A dynasty is a chain of governors, such that each governor (except the last one) *governs* the minimal domain (i.e., the projection), containing the next governor."

Dynasties 'lie dormant' in UG and they may be activated by certain agreement relations between the governors. For instance, it may be required that all the members

of the dynasty should be verbs in a certain mood/tense, or that all the members of the dynasty should govern in the same direction, etc.. In Koster's analysis, the V and the P in (40) form a dynasty; they agree in as much as they govern in the same direction, and they are both *structural governors*; moreover, the P is selected by the V; selection of the P by the A, N and government in the same direction seem sufficient for the formation of A+P and N+P dynasties, allowing the occurrence of the reflexive anaphor in any subcategorized PPs.

The definition of GC does not change; it continues to be the smallest maximal projection that contains the anaphor and a governor of it, plus the relevant opacity factor (the first accessible commanding SUBJECT (i.e., subject, or finite Inflection for a subject anaphor)), but now 'governor' may also mean 'dynasty of governors' V+P, A+P, N+P. An anaphor in a subcategorized PP must have an antecedent in this GC; i.e., it must be bound within the c-command domain of an accessible subject or INFL. If this condition is violated, ill formedness results.

(42)   Bill is very proud of himself/*herself.
        They are in love with one another.
        In a way, I introduced him to himself/*themselves.

We could then define GC parametrically, as follows, showing the difference between English, on the one hand, and Romanian and French, on the other.

(43)

γ is a Governing Category for an anaphor α iff
γ is the minimal X^{max} which contains α, and

      a. has the governor of α French, Romanian clitics
      b.has a subject, or
      c. has a [+AGR]Inflection   English

Notice that this hierarchy has the subset property, i.e., the contexts of occurrence of the reflexive clitics in French, Romanian form are included in the contexts of occurrence of the reflexive *self* in English.

In Norwegian, infinitive verbs form dynasties with finite verbs, so that an anaphor (*seg* in (44)) in an infinitive clause may find its antecedent in the main clause, because its governor is, in fact, the sequence V infinitive + V finite. The English equivalent of the Norwegian sentence below is ill-formed.

(44)   Norwegian   Olai bad oss [PRO snakke om seg,] (cf. Koster
                     1987, 151)
                     Ola, asked us [PRO to talk about himself,.]
                     'Ola asked us [PRO to talk about him].'
        English   *Ola, asked us to talk about himself, .

In Icelandic, finite verbs in the subjunctive may form dynasties with an indicative tense. Notice the following examples (cf. Freidin 1992: 268, 269):

(45) Icelandic   a. Jon$_i$ upplysti [$_{CP}$ hver hefði barið sig$_i$
                   .Jon revealed [$_{CP}$ who had-SUBJ hit self.
                   'John$_i$ revealed [who had hit him$_i$]'.
      English   *John$_i$ revealed who had hit himself$_i$

(46) Icelandic   *Jon$_i$ upplysti [$_{CP}$ hver hafði barið sig$_i$.
                   Jon revealed [$_{CP}$ who had-IND hit self.
                   'John revealed [who had hit him].'
      English   *John$_i$ revealed who had hit himself$_i$.

Sentences (45a), (46a) differ minimally, the only difference is that the subjunctive of the verb 'have' hefði in (45a) is replaced by the indicative hafði in (46a). Interestingly, the subjunctive clause does not define a binding domain, although it has finite agreement and its own subject [hver - 'who']. The reflexive anaphor sig may be bound from outside the subjunctive clause, by the subject of the main (indicative) clause. The relevant opacity factor, delimiting a binding domain for the reflexive is indicative tense; this is clearly seen in (46a); the embedded clause in (46a) has an indicative tense and no longer allows the reflexive object sig to be bound from outside its clause. Thus, in Icelandic, a reflexive may be bound in a higher clause domain, as long as the intermediate verbs are in the subjunctive mood and may form dynasties with the first indicative tense. Here is one more example: notice that the English equivalents of the Icelandic sentences are ungrammatical on the intended readings.

(47)   Jon$_i$ segir að Maria viti að Haraldur vilji að Billi meiði sig$_i$.
        Jon says that Mary knows-SUBJ that Harold wants-SUBJ that Bill hurts-SUBJ himself.

Infinitives in Icelandic (clauses that do not have I^0 [+ Agr] also do not define binding domains (whether they have a subject, or not) (cf. Freidin, 1992: 269, Koster 1987, 151).

(48) Icelandic   Jon$_i$ telur [$_{IP}$ mig$_j$ hafa svikið sig$_i$]
                   John believes me to have betrayed self.
                   Johm believes me to have betrayed him.
      English   *John believes [me to have betrayed himself$_i$]

Thus, the environments that allow the reflexive in Norwegian form a proper subset of those that allow reflexives in Icelandic. Coming back to the formulation of Principle A, we may say that an anaphor has to be bound in its governing category; the parametrized definition of GC suggested by this discussion might run as (49) (cf. Koster 1987:321); the different opacity factors define successively larger and "more marked" binding domains ("more marked" because the anaphor-antecedent relation is typically *local*, not long distance.)

(49)   Languages
γ is a governing category for an anaphor α , iff|
γ is the minimal X^{max} which contains α, and
a. has the governor of α   French,
                                                              Romanian clitics

b. has a subject, or
c. has an I^O[+ Agr], or   English|
d. has a Tensed Inflection   Norwegian
e. has an Indicative Tense   Icelandic

The concept of governing category can thus be parametrized, and this accounts
for one type of cross-linguistic variation in the domain of the anaphoric relations
studied by Binding Theory.

4.2. A second important dimension in characterizing anaphoric processes has
to do with the *antecedent*. We have so far allowed that the antecedent is any *argument*
in the given binding domain. The reflexive in the following English examples may be
bound by the IO, as well as by the subject.

(50)   a.   I, told him, about myself, .
        b.   I, told him, about himself,.

It has been shown that not all arguments are equally good binders. In general,
for many anaphors, the preferred, if not the only possible antecedent, is *the subject*. The
subject is the unmarked antecedent. We have already mentioned the case of Romanian
and French reflexive clitics, which can only take the subject as antecedent.

Of late, attention has been drawn to a class of "long distance anaphors"
(Giorgi(1984)). Long distance anaphors are anaphors governed by dynasties (i.e., by a
sequence of governors) and the required antecedent is the highest c-commanding
subject, the NP, which is the subject of the dynasty. Let us consider the anaphor *ser* in
Icelandic (Koster, 1987, 321), which is a long-distance anaphor. The subjunctive in the
complement clauses forms a dynasty with the indicative in the main clause.

(51)   Jon, segir a Haraldur komi fyrst Maria bjodi ser,.
        John says that Harold comes-SUBJ since Mary invites-SUBJ self.

The minimal domain containing the anaphor *ser* and an Indicative tense is the
main clause (as shown above, for Icelandic). Both (masculine) subjects *Jon* and
Haraldur are within this domain, so that both qualify as possible antecedents (for an
ordinary anaphor, which is not long distance); however, since *ser* is a long-distance
anaphor, only the subject of the dynasty, that, is the main-clause subject *Jon* qualifies
as antecedent and the sentence is not ambiguous. Giorgi (1984) points out that the
Italian word *proprio* is a long-distance anaphor. The main clause subject in (52a) is the

subject, while (52b) shows that a second intervening subject does not lead to ambiguity; the highest subject is the antecedent for long-distance anaphora:

(52)   a. Osvaldo pensava che quella casa appartenesse ancora alla propria famiglia.
Osvaldo thought that that house belonged-SUBJ still to self's family.
b. Maria sperava che Osvaldo ritornasse in patria prima che il fisco sequestrasse il proprio patrimonio.
Maria hoped that Osvaldo would return SUBJ to his country before (that) the IRS sequestered-SUBJ the self's estate.
'Mary hoped that Osvaldo would return to his country before the IRS sequestered her estate.'

Maria is the only possible antecedent, in spite of the fact that both *Maria* and *Osvaldo* are c-commanding subjects in the mimimal domain containing Indicative Tense.

When an anaphor shows preference for the subject, it is said that it shows *subject effects*. Long-distance anaphors show subject effects.

While subjects are particularly good antecedents, arguments in PPs are less good antecedents; generally, an argument in a c-commanding PP may serve as an antecedent (only) for an anaphor, which is a PP.

(53)   a.   a book by John about himself
b.   I talked to John about himself
c.   Am fost de acord cu Ion asupra lui însuși.

In the beginning of this chapter, we generally spoke about anaphors and pronouns and stated the binding conditions, as if they were valid for all anaphors and pronouns alike. Closer examination of the facts has acknowledged the existence of particular subclasses of anaphors that showed individualized behaviour, such as the long-distance anaphor; in fact, we expect that even in the same language, distinct anaphors may exhibit (slightly) different behaviour. Anaphoric elements are among the *functional* constituents of a language and it has often been stressed that a highly idiosyncratic behaviour is among the defining properties of functional categories.

Thus, even in English, there are differences in the distribution of the reciprocal and the reflexive pronouns. To give just one example, reflexives cannot be used as Genitive determiners in English:

(54)   They bought each other's books.
**They bought themselves's books.

The difference between reflexive and reciprocal pronouns is greater in Romanian, which uses complex reciprocal forms *'unul....altul'*. They count as one constituent/argument of the sentence, but exhibit a complex binding pattern. The first

pronominal *unul* is bound by the subject, and has Nom Case [transmitted through chain formation to a non-governed position]. The second argument is case-marked by the verb or by the preposition).

(55)	a.	Ele depind una de alta.	(cf. a depinde de-)
	b.	Ei luptă unii contra altora.	(a lupta contra-)
	c.	Ei se iubesc unul pe altul.	(a iubi-)
	d.	Ei (îşi) aparţin unul altuia.	(a aparţine-)
	e.	Ei vorbesc unii cu alţii.	(a vorbi cu)

Coindexation of the DO/IO argument position with the subject explains the doubling of the reciprocal by a reflexive clitic with regular transitive verbs (*a iubi, a critica, a spăla*...) quite apart from the existence of inherent reflexive/reciprocal verbs (*a se lupta cu, a se vorbi cu*) (for more on reciprocals in Romanian and related languages see Pană 1974, Cornilescu and Urdea (1987), Aoun (1985)).

Another, very common phenomenon is the fact that the *same forms* may function as both *anaphors* and *pronouns*. In Romanian, French a.o., there is homonymy between the personal and the reflexive pronoun in the first and in the second person.

(56)	a.	El mă vede în oglindă.	[personal pronoun]
	b.	Eu mă văd în oglindă.	[reflexive, anaphor]
	c.	El îl vede în oglindă.	[personal pronoun]
	d.	El se vede în oglindă.	[reflexive anaphor]

A similar case is that of possessive forms in English, which have pronominal, as well as anaphoric uses (cf. also Koster 1987: 343).

(57)	a.	John$_i$ rather likes his$_{i,j}$ style.	[pronominal use]
	b.	He$_i$ broke his$_{i,*j}$ neck.	[anaphoric use]
	c.	They$_i$ admire each other$_i$'s style.	

This brings to light the further important problem that anaphors and pronouns are not always in complementary distribution. One way of dealing with this problem is to formulate slightly different governing categories for Principles A and B, as interestingly proposed in Chomsky (1986b). Alternatively, we may say that there is an area of *core cases*, where anaphors and pronouns are indeed in complementary distribution, an area which allows the learner to acquire the basic distinctions between pronouns and anaphors. Principle B is a negative condition prohibiting the use of pronouns in certain environments, where anaphors *must* be used. The effects of Principle A, for instance, have an all-or-nothing character: a sentence with a reflexive that is not bound is entirely ungrammatical. The existence of Principle B can be inferred, if we assume that in learning a language there functions a very natural anti-redundancy principle. "According to such a principle, positive evidence for a binding relation for an anaphor in some domain automatically leads the language learner to

infer that other anaphors/pronouns are excluded in the domain in question." [Koster (1987: 351)]. Thus, a child receiving positive evidence for binding of *himself* in (113a), automatically infers that other items such as *him* cannot be bound in the same context.

(58)   a.   John washes himself.
           b.   *John washes him.

The principle in question can be formulated as follows:

(59) Each domain definition specifies the binding properties of at most one type of anaphor/or pronominal.

If (59) is part of UG, one can account for the contrast between (58a) and (58b), without Principle B. A positive condition like Principle A would suffice, together with the establishment of the independently necessary lexical-type distinction between anaphors and pronominals. If it is learned that anaphors are bound in a GC of some type, it follows from (114), that pronominals are *not* bound in this GC.

In practice, there is, however, a *marked periphery* of overlap between pronouns and anaphors, and between synonymous anaphors/pronouns. In English, there is significant pronoun/anaphor overlap in the use of adjunct PPs, and more generally in the use of PPs which are not clearly perceived as subcategorized.

(60)   He frequently heard stories about him/about himself.

A second phenomenon of markedness in English and many other languages is that exceptionally, anaphoric forms are used in the absence of c-commanding antecedents in violation of Principle A, as in (61) below.

(61)   Faith in himself is John's prevailing quality.

An interesting point of view in the matter of these marked phenomena is that advanced by Bouchard (1984), who suggests that anaphors may be defined at three levels: morphologic, semantic, syntactic: a) From a morphologic point of view, anaphors are those formatives containing a morpheme which is normally associated with an anaphoric reading(R: *se / îşi /unul...altul*, E: *self /each... other /one... another* etc.). b) From a semantic perspective, anaphors are elements that cannot be interpreted in the absence of a *linguistic* antecedent. c) From a syntactic perspective, anaphors are defined as precisely those elements that function in the configuration defined by Principle A. It goes without saying that in the unmarked core cases the three criteria coincide (*Himself* in *He saw himself in the mirror* is an anaphor by all these criteria). The most important property of forms which are morphologic and semantic reflexives, but not syntactic reflexives is lack of a c-commanding antecedent:

(62)   a.A fear of himself is John's greatest problem.
           b.This is a picture of myself that was taken years ago.

A second striking property of morphologic and semantic, but not syntactic anaphors is that they may have two antecedent NPs in different structural positions, aganinst the basic rule that syntactic anaphors should have unique antecedents. Split

antecedents represent a property of pronouns, distinguishing them from anaphors, as already shown above.

(63) The rich girl showed her husband a picture of themselves.

The similarity of false anaphors and pronouns also comes out in the fact that they can be coordinated.

(64)Tom supposed that the letter had been addressed to Ann and himself.

It will remain true that, for semantic reasons, even a false anaphor needs an antecedent in the domain of the first SUBJECT, a condition which is met in all the examples (60)-(62).

Let us return to the problem of PPs; the status of a PP is somewhat problematic for PPs, in as much as the notion 'subject' (crucially involved in defining GCs in English) does not seem to be relevant for PPs. Therefore, from the point of view of Binding Theory, languages may deal with the category PP in two ways; the preposition may be reanalysed so as to include the PP in another governing category which has a SUBJECT. As shown above, this is what happens with subcategorized prepositions in English. Under reanalysis or dynasty formation, a subcategorized PP has exactly the same behaviour as a non-prepositional argument of the verb.

(65)   a.He saw him.   c. He looked at him.
        b.He saw himself.   d. He looked at himself.

Alternatively, the PP may be taken as a (defective) GC itself. The unique object of a preposition cannot have an antecedent inside the PP; therefore, syntactic anaphors are disallowed and pronouns are expected to be used. A pronoun may or may not have an antecedent outside its GC, i.e., outside the PP. This is how English regularly treats adjunct (adverbial) PPs. As remarked by Poutsma(1929-1949): "In adverbials, the personal pronoun is used practically to the exclusion of the reflexive pronoun".

(66)   He saw a snake [near him /*himself]$_{PP}$.
        He saw a snake [near her]$_{PP}$.

(67)   I pushed it away from me/*myself.

There are, however, situations of free variation, since, unsurprisingly, the border-line area separating arguments from adjuncts is, fuzzy.

(68)   a. He took the girl's hand and drew her to him/himself .[cf. Poutsma]
        b.John heard stories about him/himself.
        c. It distresses me to see him sit working listlessly, now and again staring fixedly in front of himself. [Poutsma]
        d. A simple elderly offficer staring earnestly in front of him. [cf. Poutsma]

There are also idiomatic constructions, and examples of semantic specialization, mainly as a result of historical development, given that Old English did not have reflexive pronouns; here is one example:

(69)   a. Between ourselves, three pounds is not bad for a day's work.
        b. Between us, we caught the mouse and threw him into a pail of water. (between ourselves ≠ between us)

Following Bouchard's suggestion, one may regard the anaphors in adjunct PPs as semantic anaphors, rathr than syntactic ones (since they are not bound inside the GC which is the PP itself). Semantic anaphors need antecedents in configurations which are looser than those stipulated by Principle A, but are nevertheless definalbe in terms of the hierarchy of domains in (49) and in terms of 'subject effects'. The reflexives in PPs are normally bound in the nearest SUBJECT domain, as shown by the examples below:

(70)   *He put it near herself.
        He put it near him(self).
        He was staring fixedly in front of himself.

However, semantic rules, unlike syntactic priciples, may be, and are, often overridden by pragmatic factors of discourse, linguistic and extralinguistic context, idiomaticization, etc.; all these factors may come into play in retrieving the antecedent of a semantic anaphor; for instance, in (69a), the reflexive is understood with respect to an unexpressed speech act verb that (implicitly) prefaces any statement: *'(I TELL YOU) between ourselves [THAT], three pounds is not bad for a day's work'*. It is precisely the existence of such problems that forces on the analyst the distinction between Core grammar and periphery, between unmarked and marked use, in this particulart case, between syntactic and semantic anaphors.

The actual choice between personal and reflexive pronouns in adjunct PPs seems to be controlled by a pragmatic principle of disambiguation (cf. Bouchard (1985)), given in (71) and informally saying that coreference has to be explicitly marked by use of an anaphor when it is hard to guess. Principle (71) is reflected in the examples in (72-74).Thus, an anaphor need not be used when coreference is guaranteed by the semantics of the sentence, as in examples (71), but an anaphor is needed whenever disoint reference is expected (examples (74)).

(71) The less predictable the coreference between the subject and the PP, the more predictable the occurrence of a reflexive form will be.

(72)   Obligatory coreference: him/*himself
        a. He has all his wits about him/*himself/*Bill
        b. The melody has a haunting character to it/*itself.

(73)   Possible coreference: him/himself
        He drew her to him/to himself

(74)   Improbable coreference: *him/himself
        John turned his friends against himself/*him
        Victor often chats with *him/himself.

To conclude our discussion of binding, let us examine PPs in Romanian. In this language, PPs are treated as independent GCs. Personal pronouns (full forms not clitics) are used in both subcategorized and nonsubcategorized PPs even when coreference is intended; the pronoun may have an antecedent outside its GC, which is the PP.

(75)   Ion$_i$ nu mai depinde numai de el$_{i/j}$.
         Ion$_i$ a pus cartea lângă el$_i$.

Since reflexive clitics bind only non-prepositional arguments, syntactic anaphors and syntactic pronouns are in complementary distribution in Romanian. As expected, since Romanian has a full reflexive pronoun, '*sine*', and an emphatic pronoun which is also used as a reflexive, '*el însuşi*', it is not surprising that these reflexives alternate with the personal pronoun for emphasis or for clarity:

(76)   a.Se iubeşte pe el mai mult decât pe ceilalţi.
         Se iubeşte pe el însuşi mai mult decât pe ceilalţi.
         Se iubeşte pe sine mai mult decât pe ceilalţi.|
         b.Ion$_i$ i-a vorbit lui Vasile$_j$ despre el$_{ij}$ / despre el însuşi$_{ij}$ / despre sine$_i$.

Sine/el însuşi are best viewed as semantic anaphors, since they may occur without c-commanding antecedents:

(77) Teama de sine$_i$ /de el însuşi$_i$ este cea mai mare problemă a lui Ion$_i$.

As expected, there are domain conditions on the use of *sine/el însuşi*, i.e., they need antecedents in domains that will have to be specified, as can be seen by perusing examples like the following:

(78)   Ion vorbeşte despre ea/*despre-ea însăşi.
         *S-a vorbit numai despre sine.
         Maria$_i$ a rugat ca Petru$_j$ să nu mai vorbească despre ea$_i$ /el însuşi$_j$ /
         *despre ea însăşi$_i$ / despre sine$_{j*i}$.

The choice of the competing reflexive/personal pronouns seems to be guided by the same functional priciples of disambiguation and emphasis; when coreference cannot be inferred, it will be marked explicitly; when corefernce is conceptually obligatory, overt marking is unnecessary or prohibited.

(79)   Obligatory coreference el/*?sine
         Ion avea toţi banii la el/*?sine.
         Possible coreference
         Ion e mulţumit de el/de sine.
         Unlikely coreference: *?el/sine
         Cine i-o fi făcut cunoştinţă lui Maiorescu cu sine/*el.

This ends our discussion of principles A and B, the central statements of Binding Theory.

Chapter 10

REFERENTIAL RELATIONS IN GRAMMAR (II)

THE INTERPRETATION OF BASE GENERATED
EMPTY CATEGORIES. CONTROL THEORY

1. Why the Grammar needs empty categories.

In the preceding lectures, we have established the validity of the Projection Principle, which (in a revised form) required that the lexical features of predicates, (i.e., subcategorization and θ-grids) be represented at all syntactic levels (D-Structure, S-Structure, LF). At the same time, the θ-Criterion requires that each θ-role in a θ-grid should be discharged to some argument position. Consider now the following pairs of examples:

(1)   a. John slept in class yesterday.
       b. John, promised [[e], not to sleep in class again tomorrow.]
       c. She persuaded John, [that he, should learn Greek.]
       d. She persuaded John [[e] to learn Greek.]
       e. Nimeni nu citeşte.
       f. Citeşte.

Since the lexical properties of the verbs E *sleep, learn,* R *citi* cannot have changed from one example to the next, it must be the case that there is a subject position in (1b, d, f), a position filled by an empty category and where the subject θ-role is discharged. The joint action of the *Projection Principle and the θ-Criterion is* the first *source of empty categories* in the grammar; it is the source of base-generated empty categories. The content of a base-generated empty category may be retrieved through a relation with an antecedent NP, as in (1b), (1d); a base-generated nominal, identified by another DP is notated PRO; alternatively, an empty subject, which is merely identified by Inflection, as in (1f) will be notated *pro.*

We have also seen that Move α may move a constituent indefinitely far away from its initial D-Structure position.

(2)   a. Bill's brother is in love with Cynthia.
       b. Who, is Bill's brother in love with t,?
       c. Who, does Bill believe that his brother is in love with t,?

The displaced constituent has travelled to a position which indicates neither its θ-role, nor its case/ function since all the ties of the DP with the verb that licensed it

have been severed.. Since the interpretation rules operate on S-Structures and LF, after Move α, and since information regarding the function and role of the DP is relevant for semantic interpretation, this information must be retrieved by *chain-formation*. In the preceding lectures it has been shown that moved constituents leave traces behind and that traces must be properly governed. *Movement* is thus the second source of empty categories, *the source of traces*.

2. The content of an empty category.(EC)

In previous lectures, we have identified two types of problems that relate to ECs:

a) *formal licensing*, i.e., what principle of the grammar authorizes the existence of the EC. For instance, an EC may be licensed by the θ-properties of a predicate (as in (1)). The requirement of formal licensing for ECs, follows from the principle of Full Interpretation, demanding that all the elements of a representation should be justifiable.

b) *identification* of the ECs; since speakers know, all they need to know of the content of an EC, it follows that the Grammar possesses subtheories stating the general conditions of EC interpretation; the identification of an empty head through head feature trensmission discussed in chapter 8. the theory of chains, the theory of Control are such mechanisms and theories bearing on the interpretation of empty categories..

Regarding the content of an EC, a reasonable hypothesis to entertain is that the internal properties (i.e., the content) of EC represent a subset of the set of properties of lexical noun phrases; moreover, we assume that "this subset contains the minimal properties required for an DP to be an argument (cf. Bouchard, 1984).

Intuitively. an argument is a referential DP, which denotes an extralinguistic referent, *an object*, in some domain of discourse D. The Grammar accordingly includes the following principle:

(3) Principle of Denotability

An nominal phrase will denote an object in the domain of reference D. only if that nominal phrase has a R(eferential)-index.

(Since nothing in what follows hinges on the distinction NP/DP, the older, more familiar notation will be used for the noun phrase). Let us accept, consequently, that an R-index is an obligatory feature among the internal properties of a nominal EC, guaranteeing the semantic well-formedness of the nominal EC.

Secondly, for the proper functioning of syntax, the morpho-syntactic features of *gender, number, person* of an EC must also be specified. One reason why these features are necessary is that ECs may serve as antecedents of anaphors or as heads in (other) agreement processes, as shown below:

(4)   a. John was asked [how PRO_i to behave oneself$_i$ in public].

    b. They$_i$ didn't konw [how PRO_i to prepare themselves$_i$ for the event].

    c. pro$_i$ au fost loviți$_i$

    d. pro$_i$ a intrat. abătută$_i$

An EC is therefore specified for the inherent grammatical categories of the NP, gender, number, person, the so-called F-features.To conclude, the R-index and the F-features constitute the crucial part of the content of an EC. The R-index is required for the NP to function as an argument, while the F-features are needed in agreement phenomena. In this way, an EC actually has the 'content' of a pronoun; items like *he, myself*, etc. are fully specified by spelling out their F-features: e.g., *he* [+ pronominal, III^d person, masculine, singular]. In fact, ECs function exactly like pronouns and their interpretation is modelled on the interpretation of pronouns, which have the advantage of being "visible". Case is the crucial feature that distinguishes between lexicalized, visible, pronouns and NPs and ECs. An NP is visible only if it satisfies the Case Filter, i.e., only if a case feature has been assigned to it. Lexical NPs have not only gender, number, person (i.e., F-features) but also case (the features of case + gender, number, person are conventionally labeled φ-features). The following principle of lexicalization is at work:

(5) Principle of Lexicalization

A noun N will be lexicalized only if Φ-features are present in the entry of N at PF, where φ-features are gender, number, person and case.

A central aspect of EC interpretation is to specify how an EC gets a referential index. Since learners have no overt evidence for ECs, it is desirable that in the interpretation of ECs, the Grammar should avail itself of the same indexing principles used in the interpretation of lexical NPs. Lexical NPs were shown to acquire an R-index in three different ways: an anaphor has no inherent R-index, but gets one from its antecedent; a name has an R-index and F-features intrinsically; a pronoun gets its index at S-structure and refers or corefers freely, also it will acquire the F-features of the NP whose R-index it gets. At the same time, it was the essence of Binding Theory that, whether a lexical NP is an anaphor or a pronoun, largely depends on its position in the sentence (in fact, in the defined configuration that constitutes the governing category). Similarly, depending on its position in the sentence, what is, in fact, a unique nominal EC will function as an anaphor, a pronominal or an R-expression, and its interpretation will be guided by the corresponding condition of the Binding Theory. In this chapter, we give a brief account of the interpretation of the base-generated ECs, PRO and pro.

3. Control Theory and the interpretation of PRO. The first EC we are considering is PRO, which appears in sentences like (6a); where PRO is the subject of the non-finite infinitive clause. As already explained, two questions have to be answered: a) first, what licenses PRO, and secondly, how its content is identified. PRO is licensed by the θ-*Criterion*, which requires that the subject role in the verbs' θ-grids should always be discharged to some syntactic position. PRO is also licensed by the Projection Principle, or to be more specific, by what Chomsky (1982) called the *Extended Projection Principle*, which requires *sentences to have subjects*. Remember that the Projection Principle itself spoke about the conservation throughout a derivation

of an item's lexical properties, including its argument structure and subcategorization frame; the subject was not explicitly mentioned,since it is not subcategorized. The Extended Projection Principle claims that in the unmarked case, clauses have subjects, therefore, a subject position is regularly base-generated.

(6) a. I forced them$_i$ [PRO$_i$ TO leave the place]
    b.

```
         IP
SpecI'  ╱    ╲   I'
NP      I°        ╲    VP
I_j [+Tns,+Agr_j]       V'
    ed              V    NP    CP
                   force them_i  C°        IP
                           []   SpecI'  ╱    ╲  I'
                                NP      I°         ╲  VP
                                PRO_i [-Tns,-Agr]      |
                                        TO     leave the place
```
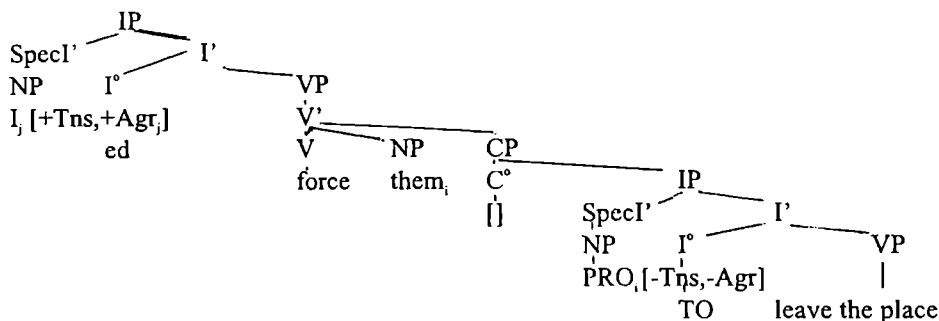
In this way, PRO is base-generated as the empty subject of a non-finite clause. It is an empty subject, because it is not case-assigned; moreover, the specific property of PRO is that it is in a position which is *ungoverned and cannot be case-marked*. Non finite Inflection (i.e., I°[-Tns, -Agr] lacks Agreement features and cannot assign case to its specifier. As known, SpecI' subject is assigned case through Spec-Head agreement, and an I° head, like TO in (6b), lacks agreement features in (English) non-finite clauses. PRO has a θ-role; it is assigned the subject role of the verb.

Let us pass on to the second problem, that of identifying the content of PRO. In example (6a - b), PRO is understood as coreferential with the DO of the main clause verb; so, PRO gets its R-index from an antecedent NP, behaving like a *lexical anaphor*.

It is, in fact, generally the case that PRO functions as an anaphor whenever it can, i.e., whenever it is in the appropriate syntactic configuration for being bound by an antecedent:

(7) a. I$_i$promised [$_{CP}$[$_{IP}$PRO$_i$ to do it myself$_i$]].
    b. [[PRO$_i$teasing the little girl]$_{IP}$]$_{CP}$ pleased John$_i$.

If no syntactically appropriate antecedent is available, PRO has arbitrary interpretation, in the sense that it is understood generically, as the generic indefinite ONE, or PRO corefers freely.

(8) It is fun [PRO$_i$ to dress oneself$_i$ up]

The antecedent of PRO, when there is one, is an argument NP, therefore, an NP which has a θ-role of its own. In (7b), for instance, PRO is coindexed with *John*. The antecedent, *John*, is the Experiencer of *please*, while PRO$_i$ is the Agent that teases the

little girl. *PRO and its antecedent do not form a chain, since a chain should have only one θ-role.* Therefore, PRO is the head of the chain whose unique member it is: {PRO}.

The module of UG which deals with the interpretation of PRO is called Control Theory. Since in a crucial class of cases, PRO behaves like a *lexical anaphor,* the Control and Binding Modules overlap (cf. Manzini (1983), Brody (1985), Koster (1984), Aoun (1987)). However, Control Theory cannot be identified with Binding Theory, since the interpretation of PRO in many instances involves the argument structure of the verb in the main clause, unlike the interpretation of lexical anaphors.

3.1. The interpretation of bound PRO requires an extension of the notion Governing Category, so as to accomodate those cases when an NP has no governor in the first X^{max} that contains it. For instance, PRO$_i$ in (6b) has *no* (good) *governor* in the IP, which is the first X^{max} containing it. Inflection strictly governs inside its I' projection, i.e., it c-commands its complement, but does not c-command its specifier;(it merely m-commands it).Moreover, non-finite Inflection cannot even relate to its Spec NP through Spec-Head Agreement. Let us call *c-domain* the first maximal projection that dominates some given XP, e.g., IP is the c-domain of PRO in (6b), since it is the first X^{max} dominating PRO. The proposal is that if an anaphor lacks a governor and, because of this, also lacks a GC, it will find an antecedent *in the governing category of the first X^{max} that dominates it, therefore, in the GC of its c-domain;* the GC of the c-domain of an XP is called *the domain governing category* of the XP.

If an anaphor does not have a GC, then it must be bound in the GC of its domain. Therefore, principle A stays valid, we have simply extended the notion GC to anaphors which lack a governor within the first X^{max} containing them. The relevant definitions are given below:

(8) Binding α binds β, iff,
      a. α and β are coindexed, and
      b. α c-commands β.

(9) Governing Category (for English) (=GC)
γ is the governing category for β, iff,
γ is the minimal X^{max} which contains β, and
a) has the (lexical) governor of β, and
b) has a SUBJECT accessible to β.

(10) Accessibility
α is accessible to β, iff,
a. α c-commands β and
    b. coindexing of α and β does not violate the i-within-i condition; (i.e.. coreference between an NP and a subpart of it is disallowed; for instance, NPs like the following are uninterpretable:*[*the friends of* [$_{NP}$ *each other*]],

11) C-domain
α is the c-domain of β, iff,
α is the smallest maximal projection dominating β

(12) Domain Governing Category (Domain-GC)
γ is the domain governing category for β, iff,
a. γ is the governing category for the c-domain of β
b. γ contains a SUBJECT accessible to β

Principle A of Binding Theory can be restated as in (13).

(13) Principle A
a. An anaphor must be bound in its governing category.
b. An anaphor without a governing category must be bound in its domain governing   category.

It is the last clause which is relevant for interpreting PRO; as indicated, PRO has no governor and therefore no GC; the relevant binding domain for PRO is then the governing category of its c-domain, which is, at the same time, the domain governing category of PRO. The clause containting PRO may be an object clause, a subject clause or an adjunct clause (adverbial, relative). Let us see how PRO is interpreted in each of these cases.

3.2.. PRO in object clauses. Consider the following examples:

(14)   a. I persuaded him$_i$ [$_{CP}$ [$_{IP}$PRO$_i$ to go]]
        b. I$_i$ was persuaded t$_i$ [$_{CP}$ [$_{IP}$PRO$_i$ to go]]
        c. I$_i$ promised (him) [$_{CP}$ [$_{IP}$PRO$_i$ to go]]
        d. I ordered him$_i$ [$_{CP}$ [$_{IP}$PRO$_i$ to go]]
        e. I$_i$ tried [$_{CP}$[$_{IP}$ PRO$_i$ to go]

In each case, PRO has a *unique* obligatory, antecedent in the main clause; the antecedent is an argument of the main-clause verb; PRO is A-bound from the main clause. According to the definitions in (11) - (12), the main clause is indeed the domain GC of PRO, as the examination of (15a) = (14a) shows. PRO has no governor, and, therefore, no governing category; the c-domain of PRO is the IP; and since C° is empty, the c-domain of PRO is, in fact, the CP. The GC of the CP is obviously the main clause, since it contains the governor of the CP, the verb *persuade,* and a SUBJECT accessible to the CP, namely, the main clause inflection I°, which is tensed and has Agreement features.

Moreover, this SUBJECT is also accessible to PRO, because Agr in the inflection of the main clause c-commands PRO, and coindexing of Agr and PRO does not violate the i-within-i condition. The main clause is the domain GC of PRO, since it contains a governor of *PRO's c-domain*, and a SUBJECT accesible to PRO. Both clauses of definition (12) are satisfied.

(15)
a.
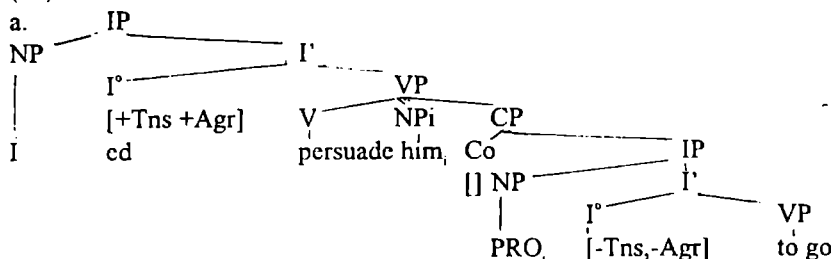
In the binding domain represented by the main clause, PRO has an antecedent, namely, the DO in the main clause. The antecedent of PRO is refered to as the *controller* of PRO. We conclude that in object sentences PRO is locally controlled in its domain governing category.

It has been noticed that, when used with the infinitive, verbs like *try, persuade, order, promise*, always require a subjectless infinitive; in other words, such verbs are always used in control contructions; they are verbs of *obligatory control*; in this, they differ from verbs like *arrange, hope* or *expect*, which may also be used with a full FOR-TO infinitive clause; the latter are verbs of *optional control.*

(16)   I tried to arrive there in time.
        *I tried for him to arrive there in time.
        I persuaded her to marry him.
        I persuaded her that the boy should not be punished.
        *I persuaded her for the boy not to be punished.
        I hope to get there in time.
        I hope that he will be given a warm reception.
        I hope for him to be given a warm reception.

Coming back to the examples in (14), it is noticeable that although the domain GC of PRO, i.e., the main clause, may contain more than one potential controller, such as, the subject and the DO in (14a), or the subject and the IO in (14d), the controller is always *uniquely determined*. It can only be the subject in the case of *promise* (which is a subject-control verb), it can only be the DO for verbs of DO-control like *force, persuade* (e.g., (14a)), it can only be the IO for verbs of IO-control like *order, command* (e.g., (14d)). In other words, in obligatory control cases, the controller is a *designated argument*. Which argument of the main verb is the designated controller is partly a *lexical* property of the verb (we will return to this problem). Notice also that the controller needs to be present for syntactic well-formedness; Compare, *We forced them [PRO to surrender]/* We forced [PRO to surrender].*

3.3. PRO in subject clauses. The examples in (17) contain infinitive subject clauses and show that in this case PRO need not have an antecedent; it may have arbitrary reference (generic *one*), or it may have an antecedent in a higher clause.

(17) a.[PRO₁to behave oneself, in public] would be of help to the nation.
b.[PRO₁to behave himself, in public] would help Bill,.
c.[Mary, knows [that [PRO₁ to behave herself,iin public] would help Bill]].
d.[PRO₁ to behave himself,i in public] would help Bill,'s development.

(18).
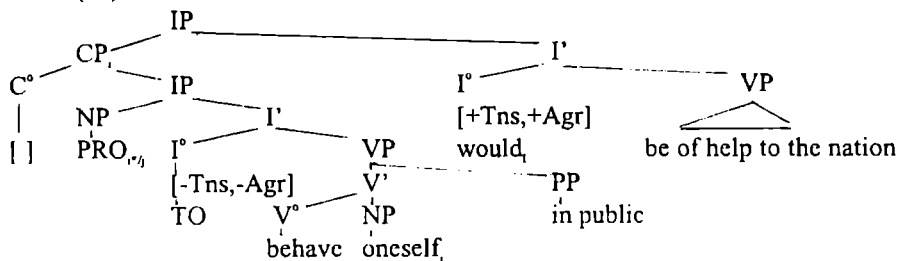
PRO has arbitrary reference in (17a), it can corefer into the main clause, as in (17b,) or even into a higher clause than its main clause(17c), or its antecedent may be contained in a constituent of the main clause (17d). Hence, one derives cocnlusion (19):

(19) In a subject clause PRO (co)refers freely.

The behaviour of PRO in subject clauses is understandable, when one notices that in a configuration like (18), which corresponds to any of the examples in (17), PRO has *no domain governing category*; therefore, there is no domain in which PRO *must* be bound. Let us see why this the case. The c-domain of PRO in (18) is the IP, and, therefore, the CP, As before, the GC of the subject clause is the main clause, which contains the (only) governor and accessible SUBJECT for CP₁, which is finite Inflection. The subject clause, CP₁ is coindexed with I°[+Tns,+Agr], *would*, But notice that I°[+Tns,+Agr] can no longer be an accessible SUBJECT for PRO; PRO is contained in the CP₁ with which I°[+Tns,+Agr] is coindexed, and, therefore, coindexation of PRO with the main clause I° would violate the i-within-i condition. Hence, there is not only no GC for PRO, but there is also no domain governing category, no domain where PRO should be bound. Because of its structural position, PRO cannot be a syntactic anaphor. This is why it may have arbitrary reference, or it may pick up an antecedent in the discourse. In contexts where it has no domain GC, PRO behaves like a pronoun (cf. Aoun & Hornstein (1987)).

3.4. Consider next the case of PRO in a subject or object clause with a non-null complementizer or a non-null Spec C':

(20) a. John asked [how [PRO₁to behave oneself, in public]]
b. John, asked [how [PRO₁ to behave himself, on the occasion]]
c. How PRO₁ to dress oneself, at parties is Mary's big problem.
d. How PRO₁ to dress herself, at the opera is Mary,'s big problem.

The PRO subject (co)refers freely no matter what the position of the sentence is (subject or object). In (20a), (20b), where the clause containting PRO is an object, PRO either has an antecedent in the main clause, as in (20a), or it has arbitrary reference as in (20b). Therefore, PRO again behaves as if it had no domain governing category. The relevant detail is the presence of the complementizer, which governs the IP, but is not a lexical governor (as required in (9) above)). In (21), the c-domain of PRO is the IP, but the IP itself has no governing category since it does not have a lexical governor. So, PRO has no domain governing category and there is no domain in which it has to be bound.

(21)
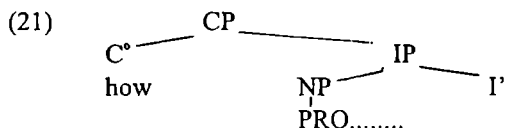
3.5. PRO in adjunct clauses. We shall examine adverbial clauses which may be attached either to VP or to I', in configurations like (22).

(22)
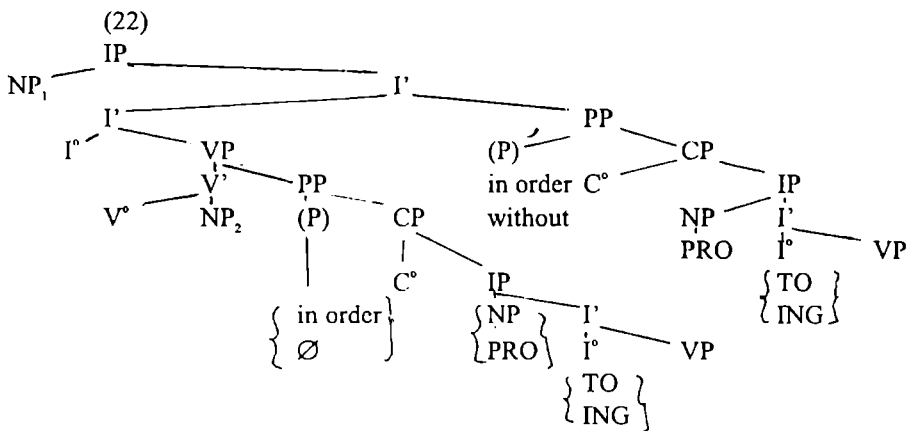
(23)   a. They [[hired Mary]$_{VP}$ [$_{CP}$[$_{IP}$ PRO to annoy Bill]]]$_{VP}$
        b. He [[invited Mary]$_{VP}$ [$_{CP}$[$_{IP}$ PRO to flatter his boss]]]$_{VP}$
        c. He [[invited Mary] [$_{PP}$in order [$_{CP}$ [$_{IP}$ PRO to entertain the boss.]]]$_{VP}$
(24)   a. They [rejected Mary]]$_{i}$ [PP in order [CP [$_{IP}$ PRO to hire Bill]]$_{i}$
        b. They [flattered Mary]$_{i}$ [CP [$_{IP}$ PRO to please her father]]$_{i}$

Suppose the P in (22) is lexically present. The c-domain of PRO is, as before, the IP and then the CP; the preposition is a lexical governor of the CP. An accessible subject, both for CP and for PRO is the main clause finite I°, or the main clause subject. The GC of the CP is the main clause, since it contains the lexical governor of the CP, the preposition, and an accessible SUBJECT for the CP. The domain-GC of PRO is also the main clause, which contains the GC of PRO's c-domain (the CP) and a subject accessible to PRO.

If the PRO clause is adjoined to the VP, PRO is c-commanded by both the subject and the object of the main clause; the position of the adjunct may thus explain why in (23) both main clause arguments are potential controllers; for example in (23b), it is not certain whether they mean to flatter the boss by inviting Mary or whether Mary is supposed to do the flattering of the boss.

If the PRO clause is adjoined to I', the only c-commanding antecedent for PRO in the domain-GC (i.e., the main clause) is the subject, and this seems to be the only control possibility for the examples in (24).

If there is no subordinating conjunction, i.e., the P in (22) is absent and the adjunct clause is simply a CP, its governor is either the V or the main clause Inflection. By parity of reasoning, the domain GC of PRO is again the main clause; this is the case of (23a) and (24b).

4. Semantic aspects of control.

So far, we have insisted on the similarity of Binding and Control. PRO was interpreted as an anaphor, subject to (an extended version of) Principle A of Binding wherever possible (wherever there was a domain-GC) and as a pronominal with free reference elsewhere.

There are however aspects of Control which are not reducible to Binding. In its specificity, control can be characterised as a *semantic relation* of *referential dependence* between the non overt PRO and some other NP which functions as an antecedent for PRO; the determination of the controller is a problem of "natural language metaphysics", because it depends on the theory of human action which is embedded in the meanings of predicates. Control thus involves both a *lexical structure* and a *syntactic configuration*. Control relations may be studied as entailments of the predicates, i.e., the control relation may be viewed as an inference endorsed by the semantics of the Predicate of the sentence (Ladusaw and Dowty (1988), Farkas (1987), Carlson (1980)). At the same time, to characterize the properties of control, the concept of *'implicit argument* is needed; therefore, reference to the a-structure of the predicate is necessary, although once again, role labels are not too helpful (for attempts to link the Thematic Hierarchy and Control see Jackendoff (1972), Nishigauchi (1984), Jones (1988)).

4.1. Semantic considerations play a part even in obligatory control constructions of the kind described in section 3 above. At first sight, it appears that the obligatory controller of the verbs in (16) is determined on the basis of a syntactic "minimal distance principle" (cf. Rosenbaum (1965)), which says that the obligatory controller is the *closest obligatory argument* to the infinitive clause (the distance between the controller and PRO can be measured in the number of nodes separating them in the PM.) The principle is needed only for three place verbs like *persuade, force, promise* which have two arguments in addition to the PRO clause, since if the main clause contains only one NP in addition to the PRO clause, that NP cannot fail to be the controller. The minimal distance principle correctly distinguishes between (22a) and

(22b,c). The IO of *promise* is optional; therefore, the designated controller for *promise* is its subject. For *force, persuade, order*, the nearest obligatory argument is the DO/IO, which is, therefore, the obligatory controller.

(25) a. I promised (him) to return the money   (subject control)
b. I forced him to return the money.   (DO control)
c. I ordered him to return the money.   (IO control)
d. *I forced/ ordered to return the money.

As (25d) shows, for verb of obligatory control, the controller of PRO cannot be deleted or expressed implicitly, it has to be an *overt argument*. The consideration of more examples indicates that the selection of the controller is also a semantic problem. The examples in (26) show that ,even with verbs of obligatory control, the controller may vary.

(26) a John, promised Bill, [PRO, to shave himself, every morning]
*John, promised Bill, [PRO, to be tall.
b. John, promised Bill, [PROj to be allowed, to shave himself, every morning.]
c. John, asked Bill, [PROj to shave himself every morning.
John, asked Bill, [PROj to be tall.
d. John, asked Bill, [PRO, to be allowed, to shave himself, every morning.]

For instance, while the controller of *promise* is the subject in (26a), it is the IO in (26b), against what we have said so far. Similarly, with the verb *ask* in (26c), the controller is the minimally distant object, but in (26d) it is the more distant main clause subject.

This variation is the effect of certain constant properties of the lexical structure of these verbs. We start from the observation that the PRO clause designates a *subevent* in the *complex event* described by any of the complex sentences in (26); as a result, part of the meaning of the main predicate specifies the semantic properties of this subevent, which is an *event-participant* in the main complex event. Notice first that the PRO clause is aspectually an event; state predicates like *be tall* are excluded. The first relevant lexical property of control verbs is that one of their argument is also understood as the *designated initiator* (Agent) of the subevent clause; this argument is coindexed with the Agent role of the verb in the subevent clause; the second lexical property of obligatory control verbs is that one of their *overt* arguments must be coindexed with the PRO subject of the subevent clause.

In the unmarked cases, PRO is the Agent of the subevent clause and the same argument of the main clause verb satisfies both requirements of being coreferential with the Agent of the subevent clause and coindexed with PRO. Thus in (26a), the subject of *promise* is coreferential with the Agent of the subevent clause (John made the promise and John will shave every morning) and the subject is coindexed with PRO. Consider (26b); the subevent clause is passive, no NP represents the Agent, we may say that this

role has been discharged to the passive affix EN, so that the Agent is only implicitly expressed. In this case two arguments of the main clause are needed to fulfill the lexical requirements mentioned above: the designated argument, the subject of *promise* is coindexed with the implicit Agent of the passive infinitive; the IO is free and can bind PRO (the sentence means, indeed, that John promised to do something resulting in Bill's being allowed to shave every morning). Notice that the IO can no longer be omitted in (26b), unlike (23a) (**John promised to be allowed to shave every morning*).

In the case of *ask, force, order*, etc., it is part of the meaning of the verb that the object of the main verb is the designated coreferent of the Agent in the subevent clause; and again some explicit argument must be the controller of PRO. When PRO is the Agent in the subevent clause, the same argument, the DO, satisfied both requirements of coreference with the Agent and coindexation with PRO (this is the unmarked case of (26c). In (26d), PRO is no longer the Agent in the subevent clause; the designated argument, the DO, is coindexed with the implicit Agent (i.e., the passive morpheme which carries the Agent role) and PRO can only be coindexed with the main clause subject; this pattern of coindexation agrees with the meaning of the sentence: John asked Bill that Bill should do something resulting in John's being allowed to shave himself every morning. The main complex sentences below, where the main clause verb is passive raise no difficulties of interpretation now.

(27)   a. Bill, was asked [t,] [PRO, to shave himself]
       [e] was asked Bill,[PRO, to shave himself]
       b.*Bill, was asked [t,] [PRO, to be allowed, to shave himself]
       [e] was asked [Bill,] [PRO, to be allowed, to shave himself]
       c.*Bill, was promised, t,[PRO, to shave himself]
       [e] was promised, [Bill, [PRO, to shave himself]
       d. Bill, was promised, (by his parents,) [PRO, to be allowed, to shave himself,
       [e] was promised, Bill, by his parents,[PRO, to be allowed, to shave himself,]

The passive of the main verb is possible when the designated argument satisfies both lexical requirements, i.e., the designated argument (= the argument that refers to the participant responsible for the subevent) is both coreferential with the Agnet of the subevent clause and coindexed with PRO , because PRO refers to the Agent of the subevent; this is the case in (24a). In (24b), the designated argument, the DO *Bill,*, is coindexed with the implicit Agent, and there is no overt argument NP to be coindexed with PRO, leading to ill formedness.

An interesting pair is (27c, d). In (24d), the (implicit) subject of *promise* (the designated argument) is coindexed with the implicit Agent of 'to be allowed', so that the indexing is *be promised, / be allowed,*:notice that both Agent roles are implicitly expressed. Furthermore, the IO *Bill* (again obligatory) is in a position to function as

controller for PRO (the indexing is Bill$_i$ / PRO$_j$) i.e., it is an overt c-commanding argument. The sentence can be well formed. Sentence (24c) differs minimally, in that PRO$_i$ is the Agent of the subevent clause and should be coindexed with the Agent of the verb *promise* in the main clause. But this is not possible since the Agent of *promise* is implicit and; for verbs of obligatory control, the antecedent of PRO must be an overtly expressed NP in the appropriate syntactic position. This requirement on PRO is *syntactic* unlike the semantic a-structure condition that says that the verb in the subevent clause must have the same Agent as *promise*, it clearly comes from Binding Theory.

5.Optional control.

.   Under optional control, two problems are worth considerin: *verbs of optional control* and *configurations of optional control.*

Like the verbs of obligatory control discussed above, the verbs of optional control (*implore, beg, shout,* a.o.) are defined by their characteristic lexical properties; as in the preceding case, the embedded clause describes a subevent; one argument, namely the IO/DO is always understood as responsible for performance of the action in the subevent; the IO/DO is understood as responsible for the subevent *even when it is not syntactically expressed,* as shown by the paraphrases of the examples below; see especially (28c).

(28)   a.   I begged him$_i$ [PRO$_i$ to spare the boy's life]
              [I begged him$_i$ that he$_i$ should spare the boy's life]
        b.   I begged him$_i$ [PRO$_i$ to go / *to be tall]
              [I begged him$_i$ that he$_i$ should go]
        c.   I$_i$ begged [PRO$_i$ to go]
              [I$_i$ begged (him) that I$_i$ should go]

Unlike verbs of obligatory control, verbs of optional control do not impose any coreference relation between one of their arguments and a participant in the subevent, this is why they allow full FOR-TO complements, in addition to PRO complements.

(29)   a. I shouted to Tom for the next recruit to be tall.
        b. I begged him for the boy's life to be spared.

Thus, (29a) means that Tom should exercise choice in selecting the next recruit so that the one he selects should be tall. Thus the DO/IO (which is a Goal with respect to the main verb) is an Agent for the subevent, even if it is not a direct participant in the subevent, as the case is in (30) or in (28c), and even if it is not syntactically expressed (as in (28c)). Like verbs of obligatory control, verbs of optional control need an *explicit NP argument* as controller; but with these verbs *there is a choice between subject control and object control.* If only the subject is overt, it will be the controller (27a, 30a,b); if both the subject and the object are present, PRO is coreferential with the Object if PRO is an Agent in the subordinate clause, as in (30c, d); otherwise there is again subject control (30e).

(30)   a. I$_i$ screamed / begged / shouted [PRO$_i$ to go]
        b. I$_i$ implored / requested / implored [PRO$_i$ to be given something to eat.

c. I$_j$ implored him$_i$ [PRO$_i$ to do it]
d. She begged him$_i$ [PRO$_i$ to spare the boy's life]
e. I$_i$ asked / implored / begged Bill [PRO$_i$ to be allowed to go].

5.1. Under configurations of optional control, we will briefly discuss two types of phenomena: *ambiguity of control* and *implicit control*. There is ambiguity of control when in the same sentence, two NPs quality as controllers.

(31) a. He$_i$ [invited Mary$_j$ [$_{CP}$ [$_{IP}$PRO$_{i/j}$ to flatter his boss]]]$_{VP}$
      b. They$_i$ hired Mary$_j$ [$_{CP}$ [$_{IP}$PRO$_{i/j}$ to annoy Bill]]]$_{VP}$

In the examples in (31), either the subject of the DO can be taken as controllers of PRO, for reason already explained above in 3.5; such sentences are ambiguous, in the way the control relation is interpreted.

An interesting linguistic phenomenon is that of *Thematic control or implicit control*, so called because the controller is not an overt NP, but a hidden, unexpressed one. Thus, consider a verb like *suggest*. A person who suggests something has an addressee in mind.

(32) My teacher suggested to me to have another topic.

In this case, I am the one who receives suggestions. In an appropriate context, the same content can be expressed leaving the receiver (Goal)impllicit.

(33) My teacher suggested - to have another topic.

Consider another example:

(34) a. It is difficult for Bill$_j$ [PRO$_j$ to have another topic]
      b. It is difficult [PRO$_i$ to have another topic.

The understood subject of *to take another topic* in (34b)is the same person or set of persons *for whom* having another topic is difficult. That is, (34b) is understood as if there were an implicit Benefictive *for* phrase acting as controller. In implicit control cases, the antecedent is recoverable on the basis of the speakers' knowledge of the predicate's *argument structure*; we might say that implicit control is *argument-structure binding* (as against syntactic binding by an NP is a specific configuration.

Notice, from (34a, b) that in argument structure binding the controller may be contained in a PP, a situation which was not generally allowed in the case of *argument* control discussed so far. The implicit argument may also be expressed as an affix, as in the cases below, where there is control by an implicit Agent, carried by the passive affix:

(35) A vote was taken$_i$ (Agent) [PRO$_i$ to elect a new chairman].

Implicit control is fairly *local*. The implicit controller must be in the first higher sentence, as it is in all the examples above. The (hidden) presence of an implicit argument which is coreferent not only with PRO, but also with an *argument* in a higher clause may however create the phenomenon of *long distance control*, where the overt controller is more than one clause away from PRO.

Here are examples:

(36)   a. Mary, said it was difficult [∅,] [PRO, to have another topic.
(Mary, said it was difficult (for her,) [PRO, to take another topic)].
b. They, thought I had suggested [∅,] |that [PROi finding each other,]
would help.]
c. John, was told, by his friends, [that [PRO$_{ij}$. to clean the house in
order   PRO$_{ij}$., to impress the guests] was not so foolish.]]

In these examples, there is an implicit controller in the immediately higher clause, which links PRO with the overt controller. Concluding on PRO, we may say the following:

a) PRO is the base-generated null subject of a non-finite clause, licensed by the θ-Criterion and the Extended Projection Principle.

b) PRO is *ungoverned,* since the Inflection whose specifier it is does not have agreement features (and there is no external governor of PRO).

c) PRO is θ-marked and heads the chain whose unique constituent it is.

d) PRO retrieves its content, that is, its R-index and F-features (gender, number, person) from an antecedent whenever possible; otherwise, PRO has arbitrary reference. The exceptional behaviour of PRO with respect to Binding Theory derives from the fact that *PRO is ungoverned*; this is why PRO always lacks a GC and may even lack a domain GC. Nevertheless, Control Theory, which deals with the interpretation of PRO, is in part an extension of Binding Theory; it also includes many semantic, non-configurational problems, mainly related to the argument structure of predicates.

This is the more or less standard view on PRO.

6. An alternative analysis of PRO

The description of PRO in the above paragraphs showed a non-unitary picture.

1) There was a class of situations where PRO could not have arbitrary reference, it *had* to be controlled by a *uniquely determined* argument of the main verb (e.g. *I forced him, [PRO, to go]).* All these cases were constructions in which: a) the PRO clause is a (direct) object, therefore, it is governed by the main verb; b) the complementizer of the PRO clause is null, so there is no empirical evidence as to whether the PRO clause is IP or CP.

2) There was a class of situations where PRO could have arbitrary refernce (37), or could have an overt c-commanding or non-c-commanding antecedent. or could have an implicit antecedent (38).

(37)   a. It would help Bill, [PRO, to behave oneslself, in public]
b. John asked [$_{CP}$how [$_{IP}$PRO to behave onelsef in public.]]
c. John was asked [$_{CP}$how [$_{IP}$PRO to behave oneself in public]]

(38)   a. It worries John, [PRO, to have to hurt her feelings].
b. It would help Bill,'s development [PRO, to behave himself, in public.

c. It was decided by John$_i$ [PRO$_i$ to behave himself$_i$].
d. Bill bought for Susan$_i$ a large flashy car [PRO$_i$ to drive].
e. Man$_i$ retains [the ability [PRO$_i$ to deceive himself$_i$].
f. My teacher$_i$ suggested [PRO$_j$ to take another topic].

In all these sentences the PRO clause is ungoverned: it is a subject or an adjunct (an attributive clause or an adverbial one). The PRO clause has a non-null complementizer as in (37b, c) or it may alternate with full FOR-TO infinitives, as in (39).

(39)   a. It would help Bill [for you to behave yourself in public].
      b. It would worry John [for his son to start taking drugs].

Thus, when it is in a governed clause that has a null complementizer, PRO *must* be like a *lexical anaphor*; while otherwise its behaviour is that of a pronoun.

We might propose that in the first case PRO is an anaphor (in the sense of Binding Theory). That is, it has a c-commanding antecedent in its *governing category*. This analysis is easily implemented, if we accept that verbs of obligatory control (*attempt, try, form*, etc) take IP rather than CP complements.

(40)   a. I$_i$ attempted [PRO$_i$ to solve the puzzle]$_{IP}$
      b. I$_i$ convinced him$_j$ [PRO$_j$ to stay]$_{IP}$
      c.

      d.
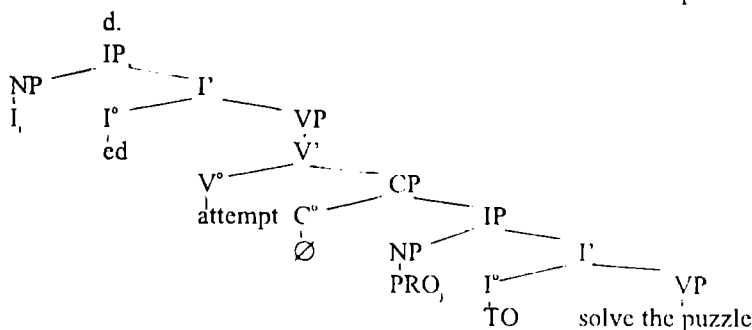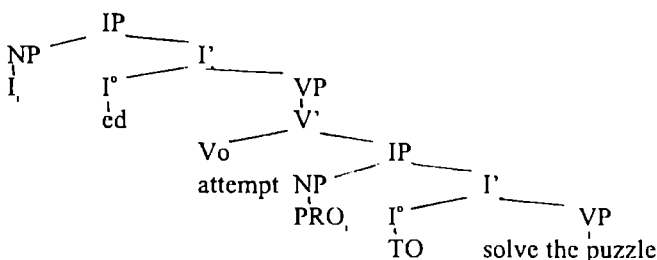
We may propose that the structure of (40a) is (40c), not (40d). In (40c) the main clause verb, *attempt*, governs the complement IP, therfore it governs its head, the Inflection TO and its specifier, PRO. The governing category of PRO is then the main

•

clause, and in the main clause, PRO which is an anaphor must be bound by a c-commanding antecedent. Notice that in representation (40d), the CP projection prevents the main verb from governing PRO, so that, lacking a governor, PRO will lack a governing category.

PRO in configurations like (40a) is in the syntactic position of an anaphor and is, therefore, an anaphor. This analysis has the advantage of allowing Principle A to remain unchanged; PRO is a *contextual anaphor* when it is governed. When it is ungoverned, it behaves like a pronoun, and there may be semantic conditions on its use. Binding and Control do not overlap, but unmodified Binding can handle those cases where PRO is like a *lexical anaphor*. This analysis of PRO is supported by several more recent analysts of PRO (Bouchard (1984), Koster (1985, 1987), Aoun and Hornstein (1987), a.o.).

Bouchard (1984, 1987) offers several contexts where reflexives and pronouns differ significantly, and shows that PRO alternatively behaves either like the reflexive or like the personal pronoun. One such example is that of the *only-NP* constructions. Consider the following sentences:

(41)　　a. Only Bill$_i$ expects that he$_i$ will win.
　　　　　b. Only Bill$_i$ expects himself$_{\cdot i}$ to win.

Sentence (41a) has two readings: on the strict reading; Bill expects that he (Bill) will win, while other people (Peter, Paul. etc) do not expect Bill to win. On the sloppy reading, Bill expects that he will win, while the other people do not expect themselves to win (i.e. Paul does not expect Paul to win, Peter does not expect himself to win, etc.). Sentence (41b) has only got the sloppy reading. Now consider the interpretation of PRO in these constructions:

(42)　　a. Only Bill$_i$ expects [$_{IP}$ PRO$_i$ to win]
　　　　　b. Only Bill$_i$ expects that it will make a strong impression on Mary.
　　　　　[$_{CP}$PRO$_i$ to read her the play]

In (42a), the anaphoric PRO allows only the sloppy reading behaving like the reflexive pronoun in (41b). In (42b), the pronominal PRO allows both the strict and the sloppy readings, excluding here the reading where PRO is arbitrary and concentrating on the one where PRO is coindexed with *Bill*. Then, on the strict reading, Bill thinks that his reading will impress Mary, but neither Peter, nor Paul thinks that Bill's reading will have such an effect. On the sloppy reading, Bill thinks that his reading will impress Mary, but Peter does not think that his own reading will have that effect, nor does Paul think so about his own reading. In (42b), PRO behaves like the overt pronoun in (41a). Therefore, PRO alternatively behaves like a pronoun or like an anaphor.

This second analysis also does not need to assume that a verb takes a CP complement even when the C" is empty; the only role the CP plays in (40d) is to protect PRO from being governed by the verb. The second analysis seems to be simpler and to have empirical backing.

Yet, it raises a problem for Case Theory. If PRO is governed in (40c), why is it not case-assigned, i.e. why is this position never lexicalized (cf. *I attempted myself to solve the puzzle.) The answer can be provided by a slight modification of Case Theory; government is not sufficient for case-assignment, although it is necessary. Aoun & Hornstein (1987) propose that case-assignment is optional, i.e. a lexical head may or may not assign a Case-feature for which it is specified. Similarly, following other researchers, Roberge (1990) distinguishes between a 'case feature' [+C] (and a case-assigning feature [+CA] of a head. For instance, a noun in the typical *destruction of the city*, is specified for the [+Genitive], but it cannot assign it, i.e. *destruction* is [+C, -CA]. The role of the preposition *of* is to assign this case feature.

The idea that case assignment is optional may be fleshed out a bit by indicating some circumstances when a potential case assigner does not assign case. Most ordinary verbs like *attempt, try, force, intend*, etc. can assign case only to an NP that they also θ-mark, as in : *I attempted it / I tried it*. Hence these verbs are not able to assign case to the subject of the infinitive clause in (40c) which is θ-marked by the infinitive. *I attempted /myself to solve the problem]*. The exception to this is the class of Exceptional Case Marking verbs, (e.g. *believe, see, discover, know, understand*, etc), which may assign case to an NP which they govern but do not θ-mark. This is why these verbs do not accept PRO-clauses, they must assign their Acc feature. A further difference between the control class (*attempt, try, intend*) and the ECM class is that some of the ECM verbs accept a non-propositional direct object in a construction which is not felt as elliptical (cf. Aoun Hornstein 1987). The control and the ECM exhibit the following typical distribution.

(43)   a.   He attempted it.
               *He attempted him.   .
               He attempted [$_{IP}$ PRO to do it].
               *He attempted [himself to do it].
       b.   He intended it.
               *He intended him.
               He intended [$_{IP}$ PRO to do it].
               *He intended [himself to do it].

(44)   a.   He believed it.
               He believed him.
                *He believes [$_{IP}$PRO to be honest].
               He believes [himself to be honest].
       b.   He knows it.
               He knows himself.
               He knows [$_{IP}$PRO to be fair-minded].
               He knows [himself to be fair minded].

To the extent that the Theory of Case can strengthen the idea that Case assignment is optional for potential assigners, the second analysis of PRO is to be preferred. PRO is an empty subject, base-generated in a position which is not case-marked. Since PRO is θ-marked, PRO should be visible at LF, even if it does not have case. We will accept the suggestion of Aoun & Hornstein (1987: 49), that, to be visible in LF, an NP must either be case-marked, or be in an obligatorily generated position. PRO meets the second requirement.

7. Null argument languages and pro₁

Small *pro* is also a base generated empty NP; unlike PRO it is typically found in governed positions, which can be case-marked. This is why pro alternates with lexical NPs : *Ion citeşte / El citeşte / pro, citeşte,* Unlike PRO, *pro* is not an *anaphor*, it is not identified by an antecedent NP; *pro* has a local identifier, usually an inflection element, which is *overtly* marked for F-features : number, gender, person. A *pro* subject is thus identified and coindexed with the Agreement component of Inflection. Normally, the reference of *pro* is not arbitrary, but specific, contextually known(e.g. (46,47)).

4.1. Languages which allow pro subjects, i.e. missing subject, in finite sentences are *null subject languages* (NSLs). Italian, Romanian are such languages:

(45)
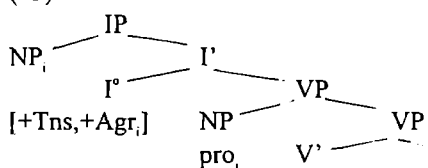
(46) R. a. 'Ce face Ion ?' 'Doarme.'
          b. Imi voi cumpăra, pro, o maşină.
(47) I. pro comprero una machina.

A *pro* subject is locally governed and identified by the Person, Number (sometimes Gender) features of the verbal Agr. Agr acts like a pronominal clitic and coindexes the subject position. Only "rich inflection" can license *pro,* i.e. only Inflection that overtly and uniformly shows Person / Number distinctions can identify *pro*(cf. in Romanian : *citeam, citeai, citea, citeam, citeaţi*). Languages like English do not have *pro* subjects, because Inflection is not rich enough to identify it; the person, number features must be spelled out by a personal pronoun : *I slept / you slept / he slept / we slept /...* Languages that do not have missing subject in finite clauses are non-null subject languages or non-pro-drop languages. In fact, there is also the intermediate position of languages that may drop only certain types of subjects: German, Icelandic, a.o. may drop a subject which is not θ-marked; that is, these languages may only license an *expletive pro*.

(48)   German   Wurde - getanzt ?
                       Was   danced   .
                       'Was there any dancing ?'
        Icelandic: Var - dansað ?(Haider, 1991: 50)

The typology that emerges distinguishes at least three types of languages:
a) non-pro drop languages (English, French) - subjects cannot be dropped at all; if a subject is non-thematic, i.e. expletive, an expletive subject is used (as in (49 b, c) below).

(49)   a.   He is reading /* pro is reading.
        b.   It is raining.
        c.   It seems that the weather has cleared up.

b) semi pro drop languages (German, Icelandic, a.o.) - these may drop expletive subjects, i.e. they license expletive *pro* .

(50)   a   Er schläft./*pro schläft.
        b.   Es wurde getanzt.
        c.   Wurde - getanzt?

c) full pro drop languages - may drop any subject, even thematic ones (Italian, Romanian).

(51)   a.   pro citește
        b.   pro plouă

NSLs often also have the property of allowing Free Inversion of the subject, but it has been proved beyond doubt that these properties are independent. Thus, Safir (1988), Roberge (1990) show that while Italian, Romanian, Spanish are NSLs with Free Inversion, other NSLs do not allow Inversion. "The pro-drop parameter does not seem to signal any significant cluster of properties, contrary to earlier assumptions (cf.Chomsky (1981). A preferable position is to consider *pro* as a null counterpart of a personal pronoun, which can be generated in any base position accessible to pronouns, on condition that there is an appropriate local governor and identifier of *pro*. The identifier is typically an inflectional element (Agreement, a clitic). Whether *pro* is at all available in a language, and also the range of positions where *pro* is possible follows from the existence of appropriate identifiers for *pro* in a language. Thus, the *Null Argument* property of a language is a derived property, rather than an independent parameter (Chomski's "pro-drop. parameter). Let us review other positions where *pro* is found specifying how it is identified.

7.1. In all Romance languages, an object *pro* may be identified by a clitic. The clitic has the necessary person, number, gender case features and is, as will be seen, an element of inflection.

(52)   a. Romanian   L,-am vizitat [pro,].
        b. French   Je l,'ai vue [pro,].
        c. Italian   Gianni la, presentera pro, a Francesco.
        d. Spanish   Juan lo, visito pro,

c.
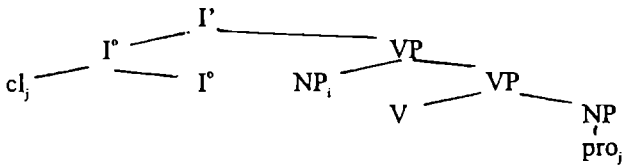
7.2. The next context where *pro* is attested is as object of a preposition; in the following examples from Arabic and Modern Hebrew, a clitic appears on the preposition and carries the necessary features for the licensing of pro_i (cf Borer (1984) Roberge (1990: 40)).

(53)   a.Modern Hebrew   it - o_i pro_i
                          with-him
        b.Arabic   wiya-ha_i pro_i
                          with-her

Here again the above examples are banned if the pronominal clitic on the preposition is absent.

7.3. Pro is also a possible subject in non-finite clauses, if there are means of identification. Rizzi (1982) argues that, in the general case, Italian infinitives have PRO subjects; a lexical subject is not allowed, because it cannot be case marked. In Italian, a finite subject is in the Nominative assigned in preverbal position, by Spec-Head Agreement. Agreement features are not present in the infinitive clause; consequently, *pro* cannot be identified and a lexical NP is likewise excluded; the subject of infinitives is PRO, except for cases where a different case-marking strategy is used (cf. Rizze (1982)):

(54)a.   *Mario affermava [questa donna non volerlo sposare].
          Mario stated [this woman not to want to marry 1?]
    b.   *Possiamo ritenere [queste persone avere sempre fatto il loro dovere].
          'We can believe [these persons to have always done their duties]
          c. Affermo [di PRO avere sempre fatto il mio dovere]
          I state [PRO to have always done my duty]
          d. Ritengo [di PRO avere sempre fatto il mio dovere]
          I believe [PRO to have always done my duty]

In Romanian, in contrast, Nominative is assigned under government by Inflection, not by Spec-Head Agreement (see chapter on Case). *Pro* can be identified by a properly governing Inflection and there is the expected alternation between *pro* and a lexical subject.

(55)   a. $Maria_i$ a plecat înainte de a se simți [pro_i] foarte
        obosită.
        b. Maria a plecat înainte de a se termina [concertul].

A special situation is that of Portuguese, which possesses a (second) inflected infinitive that shows number, person agreement. Since this infinitive is "rich", it can identify *pro*. One way of verifying the availability of *pro* as subject of inflected infinitives is to show that inflected infinitives with empty subjects are not control structures, i.e. on one reading, the subject of the infinitive is coreferential with an argument NP in the main clause, but there is also a non-coreferential (disjoint) reading.

(56)   a. Afirma [pro ter<u>em</u> lhe roubado este livro.]
'He afirms [(they) to have stolen this book from him.']
b. Acreditam [pro ter<u>em</u> gastado esse dinheiro para nada.]
'They think [to have spent this money for nothing.]
c. Ele diz [pro se<u>mos</u> pobres]
He says [(we) to be poor]
d. Confessam [pro dever<u>em</u> lhe a vida]
They admit [to owe him life]

On the disjoint reference sentences *pro* is identified by the "rich" infinitive inflection (underlined in the examples above)

7.4.So far, we have only considered cases where *pro* was both licensed and identified by an inflectional element (Agreement, a clitic). Since the features of the overt licenser and identifier where transmitted to *pro*, the latter could function as a definite pronoun, with specific interpretation. Rizzi(1986), argues, hoewever, that languages may also differ regarding what categories license *pro*. In French, *pro* may be licensed by certain prepositions (cf.Zribi-Hertz (1984)), in Italian, *pro* may be licensed by verbs, in direct object position. Rizzi (1986) concludes that *pro* is licit in positions which are governed and case-marked. When *pro* is licensed by a verb, i.e., by an element which does not possess the features necessary to identify *pro*, the interpretation of *pro* is arbitrary; this can be seen in the Italian examples below, where *pro* is an arbitrary direct object;(arbitrary pronouns take plural agreement in Italian).

(57)   a   Di solito, Gianni fotografa pro, seduti,.
In general,Gianni photographs----seated.
...Gianni usually photographs people seated.'
b.   Questa musica rende pro, allegri,.
This music renders --- happy.
...This music renders people happy.'

Thus, the licensing and identification conditions for *pro* define a distinct dimension of variation, the *Null Argument Parameter*.

Chapter 11

WH-MOVEMENT. THE EMPTY CATEGORY PRINCIPLE. MORE ON S-STRUCTURE AND LOGICAL FORM.

1. The classical account of wh constructions.

Before embarking on the discussion proper a word is necessary on the aim of the chapter. In the first part of this course, we have discussed several general properties of "unbounded movement transformations", a class of rules best represented by Wh-Movement, the rule which derives questions, relative clauses, cleft sentences (and also other constructions, cf. Chomsky (1977)). In this chapter we extend the presentation of Wh-Movement, discussing the UG modules responsible for the structure and properties of wh-constructions, these are the Subjacency Condition and the Empty Category Principle (ECP). The presentation of the ECP provides the opportunity for a very general discussion of LF. LF is a level of representation that characterizes "structural meaning", that is, those aspects of formal structure which (in part) determine the semantic (representation) / interpretation of a sentence.

Wh-Movement constructions are characterized by the following empirical properties:

a) The wh-clause is headed by a wh-phrase and there is a gap somewhere else in the sentence; the gap is understood as if the wh-phrase were placed there.

(1) a. The man [$_{S'}$ whom [$_S$Mary loves t] is John.
b. [$_{S'}$Who(m) does [$_S$ Mary love t ?].

b) The wh-phrase may be indefinitely far away from its original site, it is as if the wh-phrase crosses indefinitely many sentence boundaries.

(2) a. The man [$_{S'}$ whom [$_S$ you say [$_{S'}$ that [$_S$ everybody believes [$_S$that [$_S$Mary still loves t]]]]] is her English teacher.

b. [$_{S'}$ Whom did [$_S$ you say [that [everybody believes [$_{S'}$ that [$_S$Mary still loves t ?]]]]]]

c) Wh-constructions obey island constraints. There are configurations where extraction is prohibited. We repeat examples illustrating the major island constraints:

The Complex Noun Phrase Constraint (CNPC)

(3) a.*The bikinis [$_{S'}$ which [$_S$she reported [$_{NP}$ all the girls [$_{S'}$ that were wearing t] to the police]] are still on sale.

b.*The money [s' which [s I am discussing [NP the chaim [s' that the company squandered t]]]] amounts to 40000$.

c. *[s' What did [s she report [NP all the girls [s' that were wearing t]] to the police]] ?

d. *[s' How much money did [s you discuss [NP the claim [s that [s the company squandered t]]]] ?

The Subject Island Constraint

(4)a. *[s' What does [s [s explaining t to the students] bother you]]]?

b. *The problem [s' which [s [s explaining t to the students] bothers me]] is the theory of government.

The Adjunct Island Constraint

(5)a. *[s' What was [s he angry because [s I explained t to the students]]]?

b. *The problem [s' which [s he was angry because [s I explained t to the students]]] was his private life.

(6) a *[s' Whati did [s you wonder [s' howj [s I repaired ti tj]?

b.*[s' Howj do [s you wonder [s' whati [s he fixed ti tj-]]]?

The classical account was proposed in an attempt to provide a descriptively adequate and unitary account of the data in (1)-(6). It was assumed that the rule of Wh-Movement obeys the principle of Successive Cyclicity and of the Strict Cycle. The repeated application of successive Cyclic movement creates the effect of an unbounded dependency (as in (2)). The wh-phrase first moves to the COMP position of the clause where the wh-phrase originates leaving a coindexed trace behind. Once a wh-phrase has reached the COMP position, it can only move to the next higher COMP (=The COMP to COMP condition on Wh-Movement). The COMP position thus provides an escape hatch for movement. The traces left behind indicate the path along which the wh-phrase has travelled. The wh-phrase together with its coindexed traces constitutes a wh-chain.

(7) The boy [s' whomi you claim [ti that [Mary believes [ti that [Jill loves ti]]]] is John.

At least in languages like modern English, the COMP position cannot be occupied by two lexical elements at the same time; but an empty category (the trace) and a lexical complementizer may occur together in COMP. It was also proved that Wh-Movement obeys Subjacency, a condition on movement rules, formulated as in (8).

(8)   Subjacency Condition
        No rule can relate X, Y in the structure:
        ...X...[α... [β....Y...]]
            Y...]α....]β.....X,
        where α,β are bounding nodes (i.e., (for English), α,β = NP and S).

It appears that islands are precisely configurations where, at some point, the wh-phrase is forced to cross two (or more than two) bounding nodes. Consider examples (9) below (and re-examine (3) - (6) above which have been properly analysed to show the effects of Subjacency).

(9) a. *How much money₁ did [s you discuss [NP the claim [s·t₁' that [the company squandered t₁]]]?
b. *What₁ does [s[s/NP explaining t₁ to the students]] bother you?
c. *What₁ was [s Mary bothered [PP before [s John explained t₁ to the students]]]?
d. * What₁ did [s you wonder [how₁ [s I repaired t₁ t₁]]]?

⟶ no room here

Consider (9a), illustrating the CNPC. The wh-phrase moves to the COMP position of the sentence where it originates, so the link (t₁' t₁) of the wh-chain does not violate Subjacency. From the COMP position to the higher COMP position, the wh-phrase *how_much money₁* crosses, however two bounding nodes NP and S, violating Subjacency and causing ungrammaticality. Sentence (9b) is a Subject Island violation. There is no evidence that the gerund clause has any complementizer position. Given its distribution and properties we ought to view it as an NP projection or (less likely) an S projection. Anyway, to reach the COMP position of the main clause in a single step, the wh-phrase crosses two bounding nodes, the boundary (NP or S) of the subject, and the S node of the main clause. Consequently, there will be a Subjacency violation. Let us examine the Adjunct Island violation (9c). *Before* is best viewed as a preposition, which selects not only an NP (*before_me*), but also a sentence (S). Again, the wh-phrase moves to the COMP position in one step, since there is no lower COMP position. In so doing, the wh-phrase crosses two bounding nodes: the S boundary of the adjunct clause, and the S-boundary of the main clause. To analyse (9d), a tensed wh-island violation, we should add that two wh-phrases cannot occupy the same complementizer position at any point in the derivation. This means that, since the lower COMP position in (9d) is occupied by the *interrogative* adverb *how*, the object *what* can only move to the matrix COMP in a single step, crossing two sentence boundaries (cf. (9d)) and violating subjacency.

Thus, in conjunction with certain auxiliary assumptions regarding the complementizer position, the Subjacency Condition accounts for the island violations in (3)-(6) and (9) in a unitary fashion.

1.1. From the vantage point of our description of UG so far, it is possible to motivate some of the stipulations above and to "correct" the description in certain ways. First, as shown repeatedly before, there is evidence that the wh-phrase does not land in C⁰· but in the Spec of C position, as in (10).

(10)   What book, have you been reading t,?

```
                    CP
        Spec                    C'
         DP            C⁰              IP
  D⁰           NP      have    NP            I'
  what         book            you    I⁰         VP
                                      been    V       DP
                                             reading   t
```
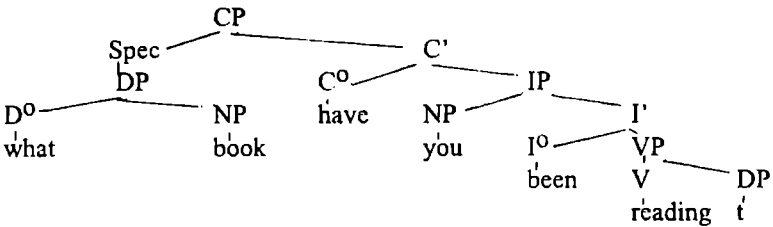
This conclusion derives from the general X-bar theory. All syntactic categories project alike; the complementizer C^0, a functional category must also have a two-level projection with one Specifier and one complement. Considering the fact that as shown in (10) or (12).

(11)

```
                C''
        Spec            X'
        YP      X⁰              ZP
```

Considering the fact that, as shown in (10) or (12), the wh constituent is a phrase (NP, AP, AvP, PP), it cannot be placed in C^0, a head, Y^0, position, but it can only land in the phrasal position Spec CP (see (10), (11)).

(12)   a.[$_{AP}$ How angry] was John?
        b.[$_{AvP}$ How fast] did he run?
        c.[$_{PP}$ About what] did you speak?

1.2. The assumption that the wh phrase is in Spec CP position can also explain how certain lexical properties of complement taking verbs can be satisfied. In previous lectures it was shown that verbs c-select and s-select their complements, and that selection is in fact a relation between heads. Thus verbs that subcategorize declarative complements (e.g. *believe)* select the C^0 *that,* that is, they select a C^0 marked [-wh], verbs that subcategorise indirect questions (e.g. *wonder)* select a C^0 marked [+wh], and there are also verbs that may select both types of complementizers (e.g. *know, remember).*

(13)   a. I believe that / *if /*whether John talked to Mary.
        b. I wonder *that /if /whether John talked to Mary.
        c. I didn't know that /if /whether John talked to Mary.

Thus, *believe* selects [+ --- [-wh]$_{C_0}$], *wonder* selects [+ --- [+wh]$_{C_0}$], while *know* selects both complementizers, having the feature [+/- --- [+/- wh]$_{C_0}$]. Consider

now examples (14), where there is no overt [+wh] complementizer and it is less clear how the lexical requirements of the matrix verb are satisfied.

(14)   a. I wondered [what book$_i$ [he had given t$_i$ her]].
        b. He wondered [who$_i$ [his daughter was in love with t$_i$]].

        c.   CP
        DP[+wh]   C'
        who$_i$ C⁰   IP
                [+wh]   his daughter was in love with t$_i$
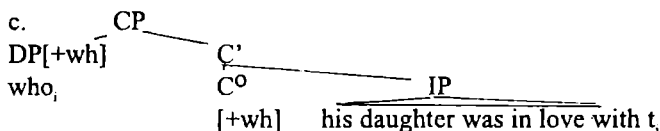
The mechanism of Spec'-Head agreement naturally explains how the selectional features of the verb *wonder* are satisfied. It is assumed in X-bar Theory that Spec-Head agreement holds generally for phrasal projections. The verb *wonder* selects an (abstract or overt) C⁰ with the feature [+wh]. Through Spec-Head agreement, the complementizer 'guarantees' the occurrence of a [+wh] phrase in its specifier position. The feature [+wh] selected by *wonder* is thus lexically instantiated as the interrogative pronoun.

1.3. Consider next the form of the wh-chain, (what$_i$, t$_i$' t$_i$) in (15).

(15)   [What$_i$ did [you say [t$_i$ that [he bought t$_i$]]]]

The foot of the chain t$_i$ is in an argument position, therefore, a position which is θ-marked and case marked; the other two members of the chain, (what$_i$, t$_i$'), are both in *non-argument* Spec CP positions. In fact, as known from θ-theory, movement of a phrase can only be to a *non-θ-marked position*, which, in the general case (leaving aside non-thematic verbs) is also a *non-argument position*. This is because the θ-Criterion prevents movement of a θ-marked phrase to a position which is also θ-marked. The form of a wh-chain starting in an argument position is thus (A ', A ', ..., A); of course, if an adjunct is wh-moved, then all the positions of the chain are A' positions (A ', A ', ..., A') (e.g. (*How$_i$ did you say* [t$_i$ *that [he claimed* [t$_i$ *that [she behaved t$_i$*]?).

It appears that A'-positions have different syntactic properties from A positions, differences that go beyond the fact that only A positions are positions where a θ-role can be assigned. One important property distinguishing between the two types of positions is that only A'-positions license "parasitic gaps". The parasitic gap phenomenon (see Chomsky 1982, 1986, Kayne (1984), Frampton (1989) for relevant discussions) consists in the fact that the same wh-phrase binds two traces. Examine the following pair.

(15)   a. Which book$_i$ did you read ti ?
        b. Which book$_i$ did you read ti before filing t$_i$ '

In (15a), the wh-phrase,*which book*, binds the object position of the verb *read*, represented by t, ; in (15b), the same wh-phrase, *which book*, binds two positions, the object position of the verb *read* (the real gap) and the object position of the verb *file*, represented by trace t,' in (15b), which is the parasitic gap. Here are a few more examples:

(16) a. Who, did you admire t, even before meeting t, in London?
b. Who, did the company hire t, after talking to t,' for only five minutes?
c. What books, should I read t, before it becomes difficult to talk about t,'?
d. Which linguist, did you insist t, to lecture, after consulting t,' in London?
e. What letters, did he file t, , without even reading t,'?

Leaving aside the complex properties of this construction which we are not going to analyse, let us notice that A-positions, unlike A' positions do not license parasitic gaps. The examples below in (17) are all severely ungrammatical. They are like their counterparts in (15) and (16) in that they contain two gaps; unlike their counterparts which involve Wh-Movement, these sentences involve the application of Passive in the main clause; Passive moves the object in subject position, therefore in an A position. A nominal in an A position does not license parasitic gaps.

(17) a.*The book, was read t, before filing t, .
b.*Kayne, was admired t, even before meeting t, in New York.
c.*These books, should be read t, before it becomes difficult to talk about t, .
d.*The letters, were filed t, without even reading t, .

The parasitic gap construction furnishes an important test for discriminating between. A and A' positions. Wh constructions also have characteristic semantic properties. In order to understand them, it is necessary to consider certain very general properties of logical form (LF).

2.On Logical Form.

The representation of a sentence in LF resembles its representation in a predicate calculus, at least in as much as both representations must indicate the relative scope of semantic operators (quantifier phrases, modal verbs, modal adverbs, etc). Consider the well-known ambiguity of sentence (18); in the predicate calculus, such an ambiguity is standardly expressed using formulas like (18 b, c), which differ in the linear order of the two quantifiers, the existential quantifier, $\exists x\ Fx$ (= 'there is at least one x such that F(x)') and the universal quantifier $\forall x\ F\ x$ (=Every x is such that F x, or For all x F(x)). The two reading are also given in informal glosses.

(18)   a.   Everyone loves someone.

b. $\forall x\ [\exists y\ (x\ loves\ y)]$
|For every x, there is some y such that x loves y|

c. $\exists y\ [\forall x\ (x\ loves\ y)]$
[There is someone such that everybody loves him]

In order to formalize ambiguities of this type at the level of LF, using movement rules similar to those which operate at the level of S-Structure, May (1985) proposes that there is a rule of Quantifier Raising, which adjoins the quantifiers to the IP, creating the operator-variable structure and indicating the relative scope of the operators. Thus the S-Structure of sentence (18), which is say (19 a), is interpreted either as (19 b-b') or as (19 c-c') at the level of LF. The quantifier which is in a higher position has wider scope:

(19)   a. $[_{IP}$Everyone $[_{I'}$ loves someone$]]$
          b. $[_{IP}$Everyone$_i$ $[_{IP}$ someone$_j$ $[_{IP}$ x$_i$ loves x$_j$ $]]]$
          c. $[_{IP}$ Someone$_j$ $[_{IP}$ everyone$_i$ $[_{IP}$ x$_i$ loves x$_j$ $]]]$

(19) b'.
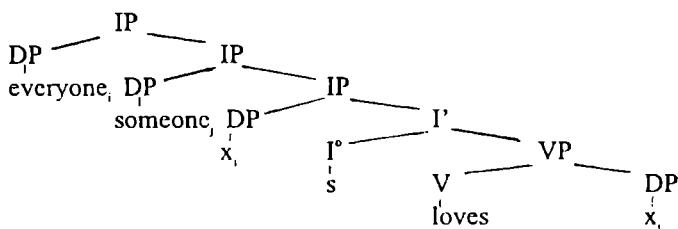
(19) c'.
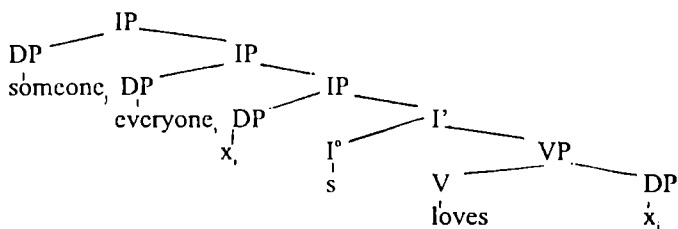
Like Wh-Movement, Quantifier Raising is an A' Movement verb, a rule which places a constituent in an A' position, adjoining it to IP. Since Quantifier Raising and Wh-Movement are both A' Movement rules, we expect them to be similar in certain respects, an expectation which, as will be seen is confirmed by the data.

It is important to remember at this point that pronouns (in the singular) can function as bound variables; a pronoun which is "in the scope" of a quantifier is coindexed with the quantifier and interpreted as an "instance of the same variable". In other words a pronoun functions as a bound variable when its semantic value is determined by a quantifier that it is coindexed with. Sometimes a pronoun is ambiguous between a referential and a bound-variable reading. Consider the examples below.

(20)   a. No one$_i$ considers himself$_{i/j}$, so smart as Noam.
        b. Everyone$_i$ thinks he$_{i/j}$ is the smartest.
        c. Everyone$_i$ is here. He$_{i*/j}$ thinks he will leave soon.
        d. Everyone$_i$ is here. They$_i$ think he will leave soon.

In (20 a) *himself* can only be a bound variable; indeed what referent could one assign to this pronoun. In (20 b) *he* is either a bound variable or a referential pronoun, that is, the two readings are either 'Everyone believes himself to be the smartest' (the bound variable reading), or 'Everyone believes of him that he is the smartest' (the referential pronoun reading). In (20 c) the bound variable reading is no longer possible, since scope cannot be larger than a single sentence. Hence the singular pronoun *he* in (20 c) cannot refer to *everyone*; only a plural pronoun is (marginally) possible, as in (20 d). Moreover, it has been shown (cf. Higginbotham (1980)) that a pronoun must be coindexed to a c-commanding quantified expression in order to be interpreted as bound by that quantified expression:

(21)   a.[Every boy]$_i$ loves his$_i$ mother.
         b.The man who disliked [the dog]$_i$ hit him$_i$
         c.*The man who disliked [every dog in the yard]$_i$ hit him$_i$.

In sentence (21a), *his*$_i$ can be interpreted as a bound variable and it is obvious that the pronoun, contained in the object phrase, is c-commanded by the quantified expression, which is in subject position. In (21b-c), the c-command condition is no longer satisfied as can be seen in (21d) below; the antecedent (*the dog / every dog*) in the relative clause does not c-command the pronoun in the main clause.

(21)   d.
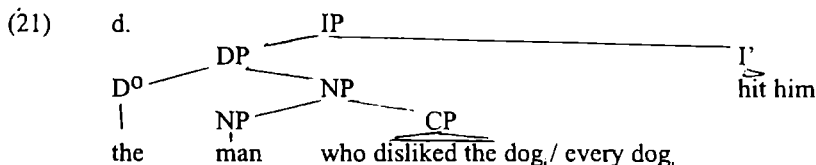
In (21 b), the pronoun is referential anaphoric pronoun subject to Condition B of Binding Theory; it should not have a c-commanding antecedent in its governing category (= the clause), and in fact, it does not.In (21 c), the pronoun cannot be interpreted as bound by the quantifier, precisely because the quantified expression does not c-command it. The following condition regarding the interpretation of pronouns can now be stated:

(22)   A pronoun must be c-commanded by its binder in order to be interpreted as a bound variable.

So far, we have treated (22) as a condition on S-Structures. As will be seen below in the analysis of epithets, there is evidence that condition (22) should hold on LF representations. Keeping this in mind let us examine the contrast between the well-formed and the ill-formed examples (23).

(23)   a. Everyone$_i$ loves his$_{i/j}$ mother.
        b. His$_i$ mother loves everyone$_i$.
        c. It upset everyone$_i$ that he$_{i/j}$ was sick.
        d. That he$_i$ was sick upset everyone$_i$.

In (23 b-d), the indicated anaphore relations are not possible. Suppose that Quantifier Raising has applied, deriving the following LF representations of examples (23).

(24) a.[$_{IP}$ Everyone$_i$ [$_{IP}$ x$_i$ loves his$_{i/j}$ mother]].
   b.[$_{IP}$ Everyone$_i$ [$_{IP}$ his mother loves x$_i$]]
   c.[$_{IP}$ Everyone$_i$ [$_{IP}$ it upset x that he$_{i/j}$ was sick]]
   d.[$_{IP}$ Everyone$_i$ [$_{IP}$ that he$_i$ was sick upset x$_i$]]

In each case, the quantifier *everyone* adjoins to IP, a position from where it c-commands and, therefore, could bind, both the variable and the pronoun. Condition (22) appears to be satisfied: since *everyone* c-commands the pronoun, it should be able to bind it. On the current interpretation of these facts, what is at stake is the relative position of the *variable* and the *pronoun*, since it is the variable that is in fact the antecedent / binder of the pronoun. In terms of linear order, in the incorrect configurations (24b, d), a variable is coindexed with a pronoun to its left. Hence the earliest proposal to deal with these case was Chomsky's Leftness Condition.

(25) Leftness Condition
A variable cannot be an antecedent for a pronoun to its left.

One recent proposal for capturing the Leftness Condition in hierarchical terms is a restatement of condition (22) as a condition on LF representations.

(26) The Strict c-command Condition
In a configuration where a pronoun P and a variable / trace V/T are both bound by a quantifier, the variable / trace must c-command the pronoun.
Thus, it appears that in the well-formed representations (24 a,c), the quantifier binds the variable and the variable is itself in a c-commanding position with respect to the pronoun. For example, in (24a), the variable x$_i$ which is in subject position, c-commands the object phrase, and is in a position to function as the antecedent of the pronoun; in its turn, the variable is c-commanded by the quantifier adjoined to the sentence. In contrast, in (24 b), the variable x$_i$ is in object position and cannot c-command the subject phrase violating the Strict c-command Condition. Hence, the variable cannot be the antecedent of the pronoun and the bound-variable reading of the pronoun is ruled out. (Sentence (23b) is well-formed if *his* is interpreted as a referentially independent pronoun: *His$_j$/John's$_j$ mother loves everyone$_i$.*)
Notice in (24) that, in the ill-formed (24 b-d), the incorrect structure appears as a consequence of the quantifier having crossed over a coreferential pronoun. This is why such structures are labelled (*weak*) *cross-over violations*. Operator-variable structures created by Quantifier Raising may, therefore, induce cross-over violations.

3. The semantic interpretation of wh-constructions.

There is a long tradition of interpreting wh-phrases as semantic operators (see, for instance, Montague (1974), Karttunen (1977), Chomsky (1977) and many others), similar to the quantifiers discussed above. The relation between a wh-phrase and the

trace it binds bears a resemblance to the binding of a variabale by a quantifier in the predicate calculus, as can be seen in the following paraphrases.

(27)   a. Who$_i$ do you see t$_i$?
         b. For which x$_i$ [x$_i$ is a person] do you see x$_i$
         b'.? x$_i$ [x$_i$: person] do you see x$_i$

(28)   a. Which pie$_i$ did you eat t$_i$?
         b.? x$_i$ [x$_{i.}$ pie] you eat x$_i$

This notation is that of restricted quantification; the material between brackets is a restriction indicating the range of the quantifier "?x ";hence, the paraphrase of (28b) might be considered to be: "For which x$_i$, where x$_i$ ranges over the things that are pies, did you eat x$_i$ ". In this analysis, wh-constructions are, therefore, assigned a quantification-like interpretation at LF.

If we consider the syntactic rule Move α in the particular case of Wh-Movement, it appears that the syntactic rule is semantically motivated. The wh-phrase, which is an operator, moves to sentence-initial position in order to take scope over the sentence. The S-Structure is semantically more transparent than the D-Structure, exhibiting the operator-variable structure of wh-constructions. Thus certain semantic operators (e.g. the wh-phrases in some languages move to take scope in syntax, while other operators (e.g. the quantifiers *someone, everyone*) move to take scope at the level of LF. In fact even wh-operators behave differently across languages. In some languages (e.g. English) syntactic movement of the wh-phrase is obligatory, in other languages (e.g. Japonese) it is impossible, while in still other languages it takes place sometimes, but not always (e.g. French). Wh-phrase that do not move in syntax, do so at the level of LF, since the semantic interpretation of wh-construction is the same across languages; (examples from Lasnik & Saito (1992: 1).

(29)   <u>English</u>
         a. What did John buy t
         b. *John bought what
         <u>Japanese</u>
         c. John-wa nani-o kaimasita ka
         John-topic what-acc bought Q (a question particle)
         'What did John buy'
         <u>French</u>
         d. Qui as-tu vu t ?
         e. Tu as vu qui?
         'Who did you see?'

3.1. <u>Variables and Binding Theory</u>. The wh-trace is a <u>variable</u> bound by an operator. Since it is an indexed nominal, we should establish its status with respect to

the Binding Conditions. The examples below show a clear similarity between referential phrases (names) and variables.

(30)   a. He thought that he said he saw John Smith.
          b. *He thought that he$_i$ said he saw John Smith$_i$.

(31)   a. Who$_i$ did he think that he said he saw t$_i$?
          b. ? x$_i$ [x$_i$: person] he thought that he said he saw x$_i$
          c. *? x$_i$ [x$_i$: person] he thinks that he$_i$ said he saw x$_i$.

The referential phrase *John Smith* in (30a) cannot be coindexed with any pronoun preceding it, even when the pronoun is outside the most deeply embedded clause which is the Governing Category of the referential phrase *John Smith*; this is why coindexation (30b) is illicit, and sentence (30b) is semantically ill-formed. Binding Theory requires that referential phrases should be free not on only in their governing category, but free in all categories. Comparison of (30) with the structurally parallel sentence (31a), suggests a refinement of Condition C of Binding Theory: a referential phrase cannot have any antecedent in an argument position. Let us restate Binding Theory as in (32).

(32)   Condition A. Anaphors should be bound in their Governing Category.
          Condition B. Pronouns should be free in their Governing Category.
          Condition C. Referential expressions should be A-free (should not have an antecedent in an argument position).

Under this reformulation of Condition C, the similar behaviour of names and variable in (30) - (31) is comprehensible. Like names, variables must be A-free. As before, coindexation of a variable with a pronoun to its left is prohibited (see (31c)). Such cases occur as a consequence of the wh-operator having moved past the pronoun. They too are cross-over violations. In (31c), the proposed coindexation violates Condition C, since the variable is coindexed with a pronoun in an A-position. Cross-over violations that can be dealt with in terms of Condition C are known as *strong cross-over* cases. We retain that variables behave like names (not like pronouns) with respect to Binding Theory, obeying Condition C. Variables are then classified as [- pronominal] empty categories. Moreover, since they clearly do not have an (overt) antecedent in their Governing Category, they are also unlike anaphoric elements; therefore we may characterize them as [- anaphoric, - pronominal] categories. They share the features of referential phrases, regarding Binding Theory.

3.2. Weak cross-over phenomena again. Since Wh-constructions exhibit operator-variable structures like quantified constructions, we expect them to be sensitive to weak cross over phenomena. This is indeed the case, as the examples below prove:

(33)   a. *[Who$_i$ does [his$_i$ mother] like x$_i$

        b. *Who$_i$ does [the girl that he$_i$ likes] miss x$_i$

        c. *Who$_i$ would [the fact that he$_i$ was sick for three days]$_{DP}$ upset x$_i$

In all these cases the pronoun *he/his* cannot be considered a bound variable, bound by the wh-operator and coindexed with the variable x . The pattern should be familar. In each case, against the Leftness Condition, there is coindexation between the variable and a pronoun to its left. Such a coindexation is illicit. At the same time, the Strict c-Command Condition is also violated in each case. Remember that according to this condition, when an operator binds both a variable and a pronoun, the variable should c-command the pronoun. In (33a-c), the variable is in object position and cannot c-command the pronoun which is contained in the subject phrase.

More recent research on the weak cross over phenomena has shown that strict c-command condition is incorrect or insufficient. Stowell (1990) shows that there is a set of constructions where neither the pronoun, nor the trace c-command the other and which are immune to weak cross over. In the following sentences, which belong to Stowell's examples, the pronouns are in adjunct clauses (outside the VP node of the main clause). The variables are in the main clause, hence neither the variable, nor the pronoun commands the other:

(34)a. Which man$_i$ did Mary dislike t$_i$ [even before she met him$_i$]

     b. Which man$_i$, [even before talking to him$_i$], did you decide that you dislike t$_i$?

     c. What$_i$ did the teacher try to buy t$_i$ [without testing it$_i$ first] ?

     d. Who$_i$ did Sally meet t$_i$ [before he$_i$ had been introduced to her] ?

     e. Paul Mason sells no wine$_i$ [before its$_i$ time].

Despite the lack of c-command between the pronoun and the trace in (34), there is no weak cross-over effect. Demirdache (1991), following Stowell (1990) proposes a different account. The idea is that the wh-phrase generally the quantifier binds indeed both the variable and the pronoun, but pronoun and variables obey different binding conditions. One auxiliary assumption is necessary, this is the fact that a phrase which contains a variable (pronoun or trace) inherits a second index (the so called "slashed index") from the variable, finally having a double index. This mechanism has been tacitly assumed so far, as can be seen in the analysis of (35).

(35)   a. [Everyone's$_i$ mother]$_j$ thinks he$_i$ is smart.

        b. [Whose$_i$ mother]$_j$ thinks he$_i$ is smart.

The pronoun in the embedded clause jis c-commanded by the main clause subject phrase, and the pronoun is interpretablḑ as a bound variable. But the pronoun he is not co-indexed with the subject phrase, it is coindexed only with a constituent of the subject phrase. The suggestion is that the subject phrase inherits the index of the subconstituent variable, as in (36).

)

(36) a. [Everyone's$_i$ mother]$_{j/i}$ thinks he$_i$ is smart.
  b. [Whose$_i$ mother]$_{j/i}$ thinks he$_i$ is smart.

In (36), the subject phrase in the main clause is coindexed with the embedded clause subject; since the c-command relation also obtains, the subject phrase in the main clause can bind the pronoun in the embedded clause.

Demirdache (1991) proposes that weak cross-over phenomena derive from the fact that bound pronouns and traces (which are both variables at LF) are subject to different Conditions on Variable Binding, namely (37).

(37) Conditions on Variable Binding
(i) A trace must be locally A'-bound.
(ii) A pronoun must be A'-bound.

(38) Local Binding
α is locally bound by ß iff it is A/A'-bound by ß, and if some φ A/A'-binds α, then either φ A/A' binds ß or φ=ß.

According to Local Binding, α is locally bound by ß, iff ß is the closest possible binder for α; i.e. any other binder φ, either is a binder of ß or is ß itself. The trace should be *locally bound* by the antecedent. In contrast, for the pronoun it is sufficient that the antecedent be in a c-commanding A' position. Let us see how (37) - (38) account for the weak cross-over cases: consider first the classical cases (39):

(39) a. *Who$_i$ does [his$_i$ mother]$_{j/i}$ love t$_i$
  b. Who$_i$ loves [his$_i$ mother]$_{j/i}$
  c. *[His$_i$ mother]$_{j/i}$ loves everyone$_i$.
  c'.[$_{IP}$ everyone$_i$ [$_{IP}$ [his$_i$ mother]$_{j/i}$ loves x$_i$]]
  d. Everyone$_i$ loves [his$_i$ mother]$_{j/i}$.
  d'.[$_{IP}$ everyone$_i$ [$_{IP}$ [x$_i$ loves [his$_i$ mother]$_{j/i}$]]

In (39 a, c/c'), the trace / variable is not locally bound by the wh-phrase / quantifier. In each case the subject phrase, inherits the index of the pronoun it contains, so that the subject phrase has the same slash index i as the trace / variable. The subject phrase is a closer c-commanding potential antecedent than the wh-phrase in (39a) or the quantifier in (39c/c'). The trace / variable is thus indirectly bound by a different closer antecedent than the intended operator, whenever there are weak cross over violations. In contrast in (39b, d/d') the operator is in fact the closest binder. This theory correctly predicts lack of weak cross-over violations in all examples of type (34) above or (40) below.

(40) Which man$_i$ did Mary dislike t$_i$ [even before she met him$_i$]

The trace is correctly locally bound by the wh-phrase, which is the closest antecedent. The wh-phrase is also in a c-commanding A' position with respect to the pronoun in the adjunct clause. The two (independent) conditions in (37) are satisfied.

This ends our discussion of weak cross-over phenomena. Notice that while strong cross over cases, which can be accounted for by Condition C of Binding Theory, characterize both variables and referential phrase (see (30 - 31) above), weak cross over cases characterize only variables, therefore LF representations Sentences like (41), which are parallel with the weak cross over violation in (33), are well-formed if the variables are replaced by referential phrases.

(41)   a. The girl that $he_{i/j}$ likes misses $John_i$.

b. $His_{i/j}$ mother likes $John_i$.

c. The fact that $he_{i/j}$ was sick for three days upset $John_i$.

4. More arguments for the existence of Logical Form.

4.1. Epithets. Epithets (cf. Lakoff (1968)) are noun phrases with pejorative connotations (e.g. *the bastard, the bloody fool, the sonofabitch, the idiot*, a.s.o.) which have interesting and peculiar syntactic properties; namely they have the properties of both pronouns and of names. Informally, the examples in (42) prove that epithets have the property that, like pronouns, they can be understood as coreferential to another noun phrase in the sentence or discourse (42); (the examples are due Hornstein and Weinberg, 1990: 133).

(42) a. Mary waved to $Bill_i$ but [the bastard]i wouldn't acknowledge her.

b. Mary slugged $Bill_i$ before [the cretin]i could make excuses for himself.

More formally, epithets may be said to interact with grammatical principles in the way that both names and pronouns do. Like pronouns, epithets are sensitive to weak cross over effects. Compare the acceptable (43) where the pronoun his_i is coindexed with a referential phrase *Baby Face Nelson*, with the unacceptable 44 a (with LF (44 b)), where the pronoun cannot be coreferential with the quantifier *every juvenile delinquent*. The LF representation (44 b) shows that (44 a) is ill-formed in as much as through its inherited index $[x_i's father]_{j/i}$ is a closer binder for the variable than the quantifier. The Local Binding Condition on traces is thus violated.

(43) $[His_i \ father]_{j/i}$ wanted to send $[Baby \ Face \ Nelson]_i$ to reform school.

(44)   a.*$[His_i \ father]_{j/i}$ wanted to send [every juvenile delinquent]i to reform school.

b. $\forall x_i [x_i$ a juvenile delinquent] $([x_i's father]_{j/i}$ wanted to send x_i to reform school.

Notice now that the epithet in (45 - 46) behaves exactly like the pronoun in the structurally parallel (43 - 44):

(45) [The bastard's₁ father]ⱼₐ should have sent [Baby Face Nelson]ᵢ to reform school.

(46) *[The bastard's ifather]ⱼₐ should have sent [every juvenile delinquent]ᵢ to reform school.

On the other hand, like names, epithets obey principle C of Binding Theory, requiring that an R-expression should not be A-bound (should not have an antecedent in an argument position). In this respect, epithets are unlike pronouns:

(47)   a.*Billᵢ expected that Billᵢ would win.
         b.*Billᵢ expected that the bastardᵢ would win.
         c.Billᵢ expected that heᵢ would win.

The question is how to account for the well-formedness of the sentences in (48), where the epithets are felicitously coindexed with antecedent noun phrases in an A position, in violation of Condition C:

(48) a. John criticized every senator, in private, while praising [the bastard]ᵢ in public.
     b. John will buy [no wine]ᵢ before the damn thingᵢ is ready to drink.

The answer is that the epithet is coindexed with quantified expressions in (48). The level at which the conditions of Binding Theory and other conditions of *semantic well-formedness are checked is Logical Form not S-Structure*, or not only S-Structure. At LF, quantifiers *escape Condition C,* because they undergo Quantifier Raising, being adjoined to the IP, in a non-argument position. Moreover, they move to a c-commanding position, where they can appropriately function as binders of the epithet. The variable left behind is locally bound (the quantifier is the closest binder), while the epithet is bound (it has a c-commanding antecedent, namely the quantifier). The LF representations in (50) are well-formed, obeing the conditions on variable binding given in (37).

(50) a.[ᵢₚ ∀xᵢ [xᵢ: a senator] [ᵢₚ John criticized xᵢ in private, while praising [the bastard]ᵢ in public]]
     b.[ᵢₚ [Noxᵢ : xᵢ a wine] [ᵢₚ John will buy xᵢ, before [the damn thing]ᵢ is ready to drink]]

The case of epithets clearly shows *the necessity for a level of LF distinct from S-Structure*. At the same time, on the basis of the properties of Quantifier Raisisng and Wh-Movement that we have presented ,one can also draw another conclusion regarding A'-movement rules, namely : *A'-movement rules induce cross-over violations.*

4.2.Antecedent Contained Deletion(ACD) The question to be broached in this paragraph is (again) whether Binding Theory applies at LF or S-Structure. Another argument will be offered that BT should be viewed as applying at LF. Since Control Theory is an extension of BT, Control Theory will also apply at LF.

The sentences dealt with involve VP ellipsis. The second occurrence of a VP may (in general)be null, if it is identical to a preceding VP, on condition that the first occurrences does not c-command the second. Coordinated sentences illustrate the general principle of ellipsis.

(51)   a.Everyone smiled, even Lucy did.
        b.everyone(λx (x smiled))
        c.even Lucy did (λx (x smiles))

(52)   a.Dulles suspected Philby, and Angleton did too.
        b.Dulles suspecdted Philby, and Angleton suspected Philby.too.

As a point of departure, it may be assumed that in the semantic interpretation of VP ellipsis sentences, the antecedent VP is "copied" into the ellipsis site, under an appropriate identity condition. Such a possibility is suggested by the existence of pairs like (52a,b).Consider now wxamples like (53), which are peculiar in that the deletion site contains the antecedent:

(53) Dulles suspected everyone that Angleton did [$_{VP}$ e]

(54) Dulles [$_{VP}$ suspected everyone that Angleton did [$_{VP}$ e]].

The problem with sentences like (53) is that the copying of the antecedent VP direcly leads to a reconstructive regress. Representation (54), an S-Structure, makes clear the fact that the deleted VP contains the anecedent, the antecedent being the verb phrase headed by the verb *suspect.*Copying the antecedent in the deletion site derives representation (55), which, in turn, contains an instance of *the same* empty VP, a.s.o.

(55) Dulles [$_{VP}$ suspected everyone that Angleton [$_{VP}$suspected everyone that Angleton did [$_{VP}$ e]]]

Apparently, the trouble is that copying has applied with respect to the S-Structure, ignoring the fact that sentence (53) contains a quantified phrase (*everyone*), which must undergo Quantifier Raising at LF, as shown in (56)

(56)   [everyone that Angleton did [$_{VP}$ e$_i$]]$_j$ [Dulles [$_{VP}$suspected e$_j$]]

The difference between this representation and (54)is that now, after Quantifier Raising, the antecedent VP (i.e., the VP headed by *suspected)* contains no more than the trace of the Raised quantifier as its object. Copying in this phrase produces the (desirable) (57):

(57)   [everyone that Angleton [suspected e$_j$]]$_i$ [Dulles [$_{VP}$ suspected e$_j$]]

The LF representation (57) is free of trouble; it indicates that this sentence(=53) is true if and only if everyone that Angleton suspected, Dulles suspected as well. Therefore, Antecedent Contained Deletion sentences cannot be interpreted. without LF representations.

Let us consider a slightly difference class of examples now:

(58)   a.Dulles suspected everyone that he did.
b.Mary introduced John to everyone that she did.
c*Mary introduced John$_i$ to everyone that he$_i$ did.
d.Mary introduced John$_i$ to everyone his$_i$ mother did.

Sentence (58c) displays a disjoint reference effect: *John* and *he* must denote distinct individuals, coreference is ruled out. relative to BT, this is completely surprising since the pronoun (58c) is just as much in a transparent position as that in (58b). Things return to normal in (58d). The problem raised by these cases once again emerges from wrongly conidering S-Structures, not Lfs, for BT.Let us examine (59), the LF of (58a):

(59) [[everyone that he$_j$ [suspected e$_i$]]$_i$ [Dulles$_j$ $_{[VP}$ suspected e$_i$]]]

In this structure, everything is correct for BT, the pronoun *he$_j$* is appropriately free in its governing category.The same is true about (60), the represantation of (58b):

(60) [[everyone that she$_j$[$_{VP}$introduced John to e]$_i$ [Mary$_j$ introduced John to e$_i$]

Things are different for (61-62), representing (58c). Representation (62) is derived first by application of Quantifier raising, producing (61), and then by copying in the antecedent VP:

(61) [[everyone that he$_j$ did[$_{VP}$ e$_k$]]$_i$ [Mary [$_{VP}$introduced John$_j$ to e$_i$]$_k$]]

(62) [[everyone that he$_j$ [$_{VP}$ introduced John$_j$ to e$_i$]]$_i$ [Mary [introduced John$_j$ to e$_i$]]

Clearly, (62) represents a violation of Condition B, since the pronoun *he$_j$* c-commands its antecedent *John$_j$*.A Principle B violation is not similarly induced under reconstruction in the LF (63) of sentence (58d). In (63) below, the pronoun *his$_j$* is syntactically free of both occurrences of John$_j$, and, hence, they can be understood coreferentially. Only for (58c) does Quantifier Raising + reconstructiion of the deleted VP feed Principle B, in contrast to the pronouns in the LF representation of the other sentences.

(63) [[everyone that his$_j$ mother[$_{VP}$introduced John$_j$ to ei]]$_i$ [Mary [$_{VP}$ introduced John$_j$ to e$_i$]]]

Moreover, these patterns of anaphora at LF are identical with those available in the overt syntax of the language, for instance in sentneces (64):

(64) a.*After he introduced John to everyone, Mary introduced John to everyone.
b. After she introduced John to everyone, Mary introduced John to everyone again.
c.*After he introduced John's mother to evryone, Mary introduced John's mother to everyone.

d.*After his mother introduced John to everyone, Mary introduced John to everyone.

In conclusion, this discussion was meant to prove that the proper level of application for Binding Theory, and, consequently, also for Control Theory is Logical Form.

5. Introducing the Empty Category Principle (ECP).

We have so far concentrated on those properties of wh-constructions which derive from the fact that these constructions involve unbounded syntactic movement. The landing site of this movement was characterized as an A' position, namelyThe form of a wh-chain where an argument moves is $(A_1', A_2.', ..., A_n')$, where all members are in A' positions (in SpecCP, in fact), except for the foot of the chain which is in an A position (a θ-marked and case-assigned position). If an adjunct moves, all the positions of the wh-chain are A' positions $(A_1', A_2',..,A_n')$. We have also defined a general constraint on syntactic movement, i.e. on movement at the level of S-Structure (not LF), namely Subjacency, in terms of which it is comprehensible why island configurations block extraction. Finally, we have shown that, from a semantic point of view, wh-movement creates operator-variable structures; the wh-phrase has the status of an operator or logical binder. The trace is a variable having the features [- anaphoric, - pronominal], features which reflect its name-like properties; like names, variables obey Condition C of Binding Theory. It is also important that wh-constructions contain an empty category created by movement, the trace. As usual, an empty category raises the problem of its identification. The Empty Category Principle (=ECP) is precisely that subtheory of UG which states under what conditions traces / variables are licit.

Informally, the ECP says that a trace is licit if it is properly bound from the nearest SpecCP, i.e. if it is coindexed with an *antecedent* (a wh-phrase or an intermediate trace) in the closest SpecCP. In this case the trace is said to be *antecedent governed*. This requirement is natural in terms of the analysis of wh-constructions presented so far. A trace is also licit if it is closely related to a lexical head, which θ marks or case marks the position of the trace; in this case the trace is *lexically* governed; *lexical government* is a subcase of government; government by a *lexical* (as distinct from a functional) *head*. The definition of government employed in the early formulation of the ECP (in LGB) is, rouglly, (65).

(65) Government
α governs β (β = a phrase) in the configuration
α $[_{\beta}....\beta^0...]$, iff
a) α is a head x^0 $(x^0 = V, A, P, N, I°[+Tense,+Agr])$;
b)α c-commands β;
c) α and ß are contained in the same maximal projections, (i.e. no maximal projection intervenes between α and ß).

In the case of lexical government, the range of governors is restricted to lexical ones, (x^0 = N V A P), or even to lexical [+V] heads, .(i.e., x^0 = V, A). The ECP –can then be tentatively formulated as in (52):

(66) Empty Category Principle (ECP)
A nonpronominal empty category (= a trace) must be properly governed.

(67) Proper Government
α properly governs ß, iff
a) α lexically governs ß, or, → α (lexically) c - comm ß
b) α antecedent-governs ß.

The need for the ECP is clearly seen in the fact that the well-formedness of a wh-construction depends not only on the general configuration where the wh-constituent originates (the island phenomenon), but also on the *nature* of the wh-constituent, on whether the wh-constituent is an object, an adjunct, or a subject. The empirical data which force the adoption of the ECP is the existence of an important class of asymmetries in the behaviour of subjects / objects / adjuncts in wh-constructions, asymmetries which cannot be explained in terms of Subjacency, because this condition takes into account only the form of the path over which the constituent travels, ignoring the nature of the constituent.

Let us first consider object / adjunct asymmetries. These are seen in the fact that certain configurations block the extraction of adjuncts, but allow the extraction of objects. Let us call *weak islands* environments which are transparent for objects, but opaque for adjuncts. We distinguish between *weak islands* and *strong islands*, such as the CNPC, the Subject Island, the Adjunct Island, the Tensed wh-Island, which do not allow the extraction of *any* constituent. Untensed wh-clauses, extraposed subject clauses, factive clauses, negative clauses (inner negatives) constitute weak islands. They allow the extraction of objects, but not the extraction of adjuncts. Here are relevant examples, showing the difference between strong / weak islands, as well as the asymmetric behaviour of objects / adjuncts in weak islands.

Weak islands
Untensed wh-islands

(68) a.?What$_i$ didn't they know how to explain t$_i$?
b.?To whom$_i$ didn't they know where to give the present t$_i$?
c. *How$_i$ did they ask you who left the party t$_i$.

Extraposition islands (extraposed subject clauses)
→ Extraposed subj

(69) a.To whom$_i$ is it time to speak t$_i$?
b. What$_i$ is it hight time to learn t$_i$?
c. *How$_i$ is it time to leave this party t$_i$?

Factive islands

(70) a.What$_i$ do you regret that you have not seen t$_i$?
b.To whom$_i$ do you regret that you could not speak t$_i$?
c.*How$_i$ do you regret that you talked to her t$_i$?

Strong islands
Complex NP Islands

(71) a.*What$_i$ have you found someone who would want to buy t$_i$?
b.*To whom$_i$ have you found someone who would speak t$_i$?
c.*How$_i$ have you found someone who would like to fix it t$_i$?

Subject islands

(72) a.*Which books$_i$ did [talking about t$_i$] become difficult ?
b.*How$_i$ would [to speak to him t$_i$] be inappropriate ?

Adjunct islands

(73) a.*What$_i$ did you leave without buying t$_i$?
b.*To whom$_i$ did you leave without speaking ti ?
c.*How$_i$ was [to leave the party t$_i$] a good idea ?

(74a)
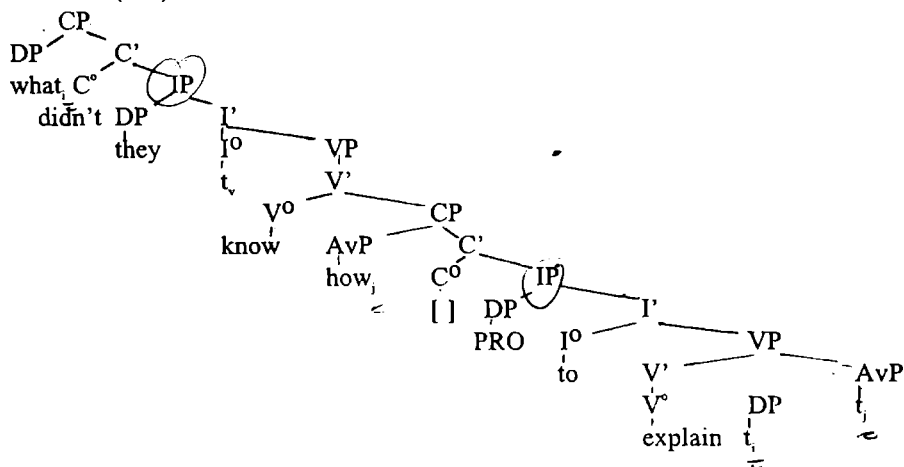
It should be obvious that Subjacency cannot be responsible for the grammaticality contrasts in the weak-islands cases (examples (68) - (70)), since Subjacency is not sensitive to the syntactic function of the constituent that moves, but only to the structure of the path which is crossed by movement. Let us examine the S-Structure of the untensed wh-island sentences (68a, c) above. It appears that both

sentence (68a) and sentence (68b) violate Subjacency. Thus, *what* in (74a= 68a) above moves across the first CP, whose specifier position is occupied by *how*, into the matrix SpecCP position. Movement across a CP node is referred to as *long movement. What* crosses two sentence (= IP) boundaries, violating Subjacency.

(74b)

```
        CP
     AvP    C'
   how_j C⁰     IP
      did  DP       I'
          they   I⁰      VP
                  t_v      V'
                  V      DP    CP
                 ask     you  DP        C'
                             who_i  C⁰        IP
                                   [ ]  DP      I'
                                       t_i  I⁰      VP
                                            T    V'        AvP
                                               V⁰    DP    t_j
                                              leave  the party
```
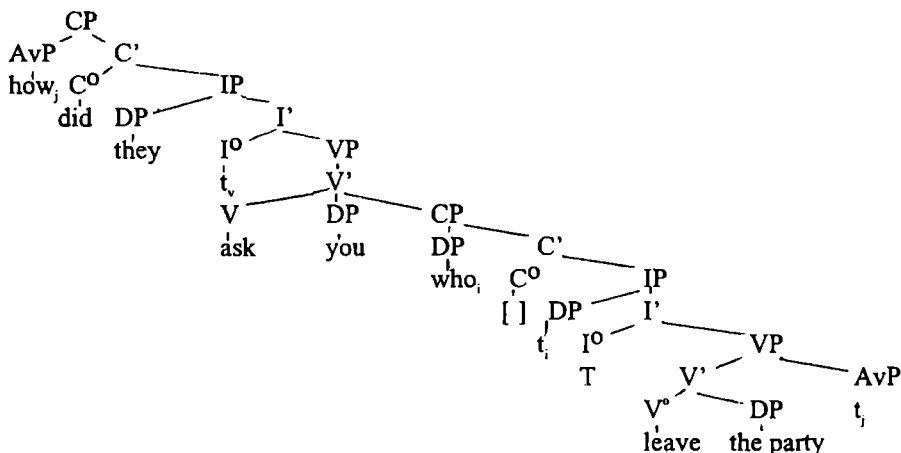
How in (74b) travels along the same path violating Subjacency. The Subjacency violation accounts for the less than perfect grammatical status of (68a = 74a), indicated by the question mark on (68a). There remains, however, a sharp grammaticality contrast between (68a-b), involving object extraction and (68c) which involves adjunct extraction. This contrast of grammaticality is accounted for in terms of the ECP. The object traces in (68a), (68b) are *properly governed*, since the verb lexically governs its objects. This is why long movement of objects is possible. The adjunct trace in (68c = 74b) is not properly governed. It is not lexically governed by the verb (the verb does not c-command it, it is outside the first projection of the verb); an adjunct trace has to be antecedent governed. But the adjunct trace in (68c = 74 b) is not antecedent governed either, because it is not bound from the nearest SpecCP position. The antecedent is too far away to identify this trace. The adjunct trace is not properly governed and the ECP is thus violated.

Consider the subject now. It is in SpecIP position, a position which is not lexically governed, since Inflection does not c-command the subject (and moreover Inflection is not a lexical head). Hence, the subject, like the adjunct can only be *antecedent* governed, it has to be properly bound from the nearest SpecCP position. This formulation of the ECP predicts a similarity of behaviour between subjects and adjuncts, as against objects. The following paradigm, involving (untensed) wh-islands confirms the prediction.

(75)   a.What$_i$ do you wonder how$_j$ to fix t$_i$ t$_j$?
           b.*How$_j$ do you wonder what$_i$ to fix t$_i$ t$_j$?
           c.*Who$_j$ do you wonder what$_i$ t$_j$ painted t$_i$?

Thus only objects may undergo long wh-movement, because only objects are lexically governed. Subjects and adjuncts must be antecedent governed from the nearest Spec CP. They can only move successive cyclically. This is not possible in wh-islands, where the Spec CP position is already occupied by a wh-word. In fact, as will be seen, the picture is more complex than this because there are also cases where subject differ from adjuncts in their behaviour under wh-Movement, and pattern like objects.

What has been said so far however, suffices to show that the ECP and Subjacency are independently needed, as well as the fact that ECP violations are stronger than Subjacency violations. A further difference between the ECP and Subjacency regards the level where these principles apply and, consequently, the range of phenomena they handle. Subjacency is a condition on overt syntactic movement and applies at S-Structure. The ECP is a principle of semantic interpretation, regarding the identification of traces. It applies at S-Structure, as well as at LF, to the traces created by wh-Movement and NP-Movement ; but it also applies to the traces created at LF by Quantifier Raising and other movement rules.

There is interesting empirical evidence that the ECP applies at LF. It is argued that, if the ECP applies at LF, then traces left by LF movement rules must be subject to it. Since the object, but not the subject is always properly governed under the ECP, the prediction of this analysis is that there will be subject - object asymmetries when quantified NPs are involved, since they must undergo Quantifier Raising at LF. Quantifier Raising of the subject may leave behind an improperly-governed trace. Kayne (1981) has indeed discovered asymmetries of this sort. Consider (76) - (77):

(76)   a. J'ai exigé que personne ne soit arrêté.
          I have required that nobody (not) be arrested.
          ...I have required that nobody be arrested.'
          b.J'ai exigé qu'ils n'arrêtent personne.
          I have required that they (not) arrest nobody.
          'I have required that they not arrest nobody.'

(77)   a. *Je n'ai exigé que personne soit arrêté.
          I (not) have required that nobody be arrested.
          b.?Je n'ai exigé qu'ils arrêtent personne.
          I (not) have required that they arrest nobody.

In (76), (77) the real negator is the negative quantifier *personne* (nobody), while the particle *ne* is a scope marker. *Ne* indicates that in (76) *personne* has narrow scope with respect to the main clause verb, while in (77), *personne* has wide scope with respect to the main clause verb. The problem is to account for the grammaticality contrast between the somewhat awkwaed(77b) and the clearly ill-formed (76a). The

assumption that quantifiers raise at LF to take scope, and that the traces left behind must be properly governed, immediately account for the data. The following are the LF representations of the four sentences above:

(78)   a. J'ai exigé [$_{CP}$ que [$_{IP}$ personne$_i$ [$_{IP}$ t$_i$ ne soit arrêté]]].
       b. J'ai exigé [$_{CP}$ que [$_{IP}$ personne$_i$ [$_{IP}$ ils n'arrêtent t$_i$]]].
(79)   a. *[$_{IP}$ Personne$_i$ [$_{IP}$ je n'ai exigé [$_{CP}$ que [$_{IP}$ t$_i$ ne soit arrêté]]]]].
       b. [$_{IP}$Personne$_i$ [$_{IP}$ je n'ai exigé [$_{CP}$ qu'ils arrêtent t$_i$]]].

The trace of *personne* is properly-governed in all cases except (79a). It is lexically governed by the verb in (78b), (79b) and it is antecedent-governed by *personne*, from the (nearest) IP adjunction site, in (78a) The trace of *personne* is not however, properly-governed in (79a), since the antecedent quantifier, *personne* is too far away. On the basis of such cases it has been argued that the ECP should characterize LF-representations.

6. The Barriers approach to Subjacency and the ECP.

What has been said so far is presumably enough to suggest that there is an important similarity between subjacency (which regards, however, only movement at S-Structure) and *antecedent government*. Antecedent government requires that the antecedent of a trace should be sufficiently local: it should be in the nearest SpecCP. Subjacency says that the wh-phrase cannot travel too far away from the trace, it must not cross more than two bounding nodes (where the bounding nodes (for English) are NP, S). Both principles concern the antecedent-trace configuration.

In "Barriers", Chomsky attempts to unify subjacency and antecedent government, therefore, he tries to unify the theories of movement and government. He does this by showing that the same nodes block movement and government alike; the same nodes are *barriers* for both government and movement. The intuition that Chomsky exploits in defining the concept of *barrier*, which goes back to Cattell (1976), is that complement projections are "transparent" through the relation that they have with the verb, while projections which are not complements block movement. The relevance of the complement / non-complement distinction is easy to confirm if we remember that subject projections and adjunct proportions are islands (as extensively shown above); all the cases of unbounded movement are instances of movement out of a complement projection.

To understand the technical definition of the concept 'barrier' it is appropriate to clarify the comcept of *domination* in a syntax that makes ample use of adjunction. Let us examine the adjunction configuration below:

(80)

Several remarks are in order. First, apparently, the category ß has two segments the lower ß and the upper ß (which includes α as well). Chomsky assumes that in (80) α is not dominated by ß. Generally, one category ß dominates α, only if all the segments of ß dominate α. The following definitions of *domination* and *exclusion* (lack of domination) are proposed:

(81)   ß dominates α only if all segments of ß dominate α.

(82)   ß excludes α iff no segment of ß dominate α.

Notice the particular situation of the adjoined constituent α in (80): α is not dominated by ß, since only one segment of ß includes α; at the same time, α is not excluded by ß, since one segment of ß is above α. This particularity of the configuration is mode use of in the system, as can be seen later.

Informally, as already hinted, a barrier is a maximal non-complement projection which intervenes between a governor and a governee, or between a trace and its (immediate) antecedent in a chain. As known, the property that distinguishes arguments is that they are θ-marked by a head; but θ-marking is done in the X' or in the X'' projection of the head (see 83). Complements, unlike subjects, are sisters to heads, they are θ-marked inside the first projection of the head; they are θ-governed. What counts is to identify complements of lexical, as opposed to functional, heads. The following notions can be defined. (θ government has already been introduced in precious drapters):

(83)

```
              X''
        ___/      \___
  Subject              X'
          X⁰  ___/   \___  Object
          |_____|
              θ-marking
```
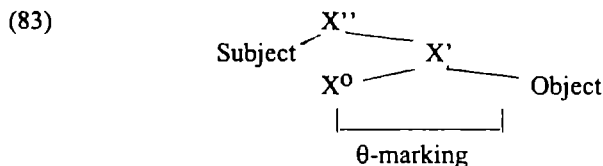
(84) θ-government
ß θ-governs α iff ß is a head, ß θ-marks α, and ß is a sister to α

(85) L-marking (Lexical government)
ß L-marks α iff ß is lexical and ß θ-governs α

A barrier can now be defined as an "intervening" non-L-marked maximal projection. The definitions we quote represent a somewhat simpler notational variant of the Barriers systems, due to Lasnik and Saito (1992).

(86) <u>Barrier</u>

ß is a barrier for α if,

a. ß is a maximal projection (and ß ≠ IP)

b. ß is not L-marked

c. ß dominates α.

A node can be an *inherent* barrier, or it can inherit barrierhood from a barrier that it immediately dominates, which is not L-marked. A stipulation of the system is that *IP is not an inherent barrier; it can only inherit barrierhood.*

The definition of Barrier relies only on the notion of θ-government and L-marking and it can be used to define subjacency and government without circularity.

6.1. The Barriers version of Subjacency. In the Barriers framework, Subjacency becomes a well-formedness condition on wh-chains. In a well-formed chain $(\alpha_1, \alpha_{i+1},\ldots,\alpha_n)$, **in each link** (α_i, α_{i+1}), α_{i+1} has to be subjacent to α_i ; α_{i+1} is subjacent to α_i if there is at most one barrier between them; in other words if there is at most one barrier that dominates α_{i+1}, but does not dominate α_i. In terms of domination, α_{i+1} is subjacent α_i if there is at most one barrier for α_{i+1} that excludes α_i . Notice the importance of the adjunction configuration now, comparing (87 a, b) below, on the assumption that ß is not L-marked, and is thus a potential barrier. In (87a), ß dominates α_{i+1} and it excludes α_i since no segment of ß dominates α_i ; in this case ß will be a barrier for α_i ; consider (87b); α_{i+1} is adjoined to ß; consequently ß no *longer dominates* α_{i+1} and it will not count as a barrier for α_{i+1} even if it is not L-marked. Through the interplay of dominance and exclusion, adjunction to a maximal projection becomes an escape hatch for movement, a means of circumventing a barrier.

(87)　　a.
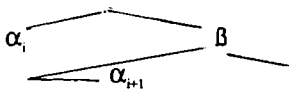
b.
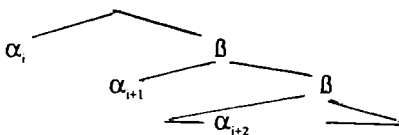
It is also important that not all maximal projections can be adjoined to .The following restrictions operate on adjunction:

(88) Adjunction.

a. Arguments (i.e. DPs, CPs) cannot be adjoined to; (this follows from the θ-Criterion)

b. IP adjunction is also disallowed (by stipulation).

The status of the VP is also important. It has been convincingly argued (cf. Law (1991), Lasnik & Saito (1992) that the VP node is not a barrier; the argument is that in most languages, either at S-Structure or at LF the verb raises to Inflection, and the new lexical head [V^0+I^0] can L-mark VP (Irish is a language where it can be argued that at least sometimes VP is a barrier (cf. Law(1991)). Let us admit that VP is not a barrier (in the unmarked case), so there is no need to resort to VP adjunction to circumvent a possible VP barrier (though this possibility exists in principle). Some evidence that VP is L-marked comes from examples like (89) where the VP has been moved, leaving behind a trace which appears to be lexically governed by a lexical head in Inflection. Alternatively, if VP can be argued to be a barrier, it can be circumvented by adjunction of the moved constituent to VP, as proposed in " Barriers".

(89)   They told him to win the race, and [win the race]$_{VP}$ he did t$_{VP}$

The proposed definition of subjacency (90) below) allows at most one barrier to intervene between two links of a chain.

(90) Subjacency

a. In a well-formed chain with link (α_i , α_{i+1}), α_{i+1} must be 1-subjacent to α_i .

b.ß is 1-subjacent to α iff there is at most one barrier for ß that excludes α.

There may be one barrier between the links of a chain, but not more that one. If there are two barriers between ß and α, i.e. if ß is 2-subjacent to α, a very serious violation results. Let us see how this definition handles island configurations. We start with the Complex NP Constraint.

(91) *[$_{CP}$ Where$_2$ did [$_{IP}$ you see [$_{NP}$ the book [$_{CP}$ which$_1$ [$_{IP}$ John put t$_1$ t$_2$]]]]]

The movement in (91) clearly violates Subjacency. The embedded IP is not a barrier, since IP is never an inherent barrier. The CP node is, however, a barrier because it is not L-marked; the NP is a barrier by inheritance, it inherits barrierhood from the non-L-marked CP. Two barriers are crossed in violation of Subjacency. Consider subject islands next:

(92) a.?*[$_{IP}$ Who$_i$ did [$_{IP}$ [$_{NP}$ pictures of t$_i$] please you]]?

b.*[CP What$_i$ did [$_{IP}$ [$_{CP}$ t$_i$' that [$_{IP}$ he explained t$_i$ to me]] bother you]?

Consider sentence (92b), represented in (92c) below. The first link of the chain (t$_i$', t$_i$) is well-formed ; as already explained, the wh-phrase being extracted can successfully move from $_u$ to t$_i$', the SpecCP position of the subject clause. Its next

possible landing site is the Spec of th matrix CP; but this movement crosses two barriers. The embedded CP is a barrier for t_i' since the subject clause is not L-marked, the matrix IP is also a barrier for t_i' by inheritance, because it is the first maximal projection that dominates CP. Thus, the second movement violates Subjacency and the ungrammaticality of (92b) is correctly predicted.

(92) c.
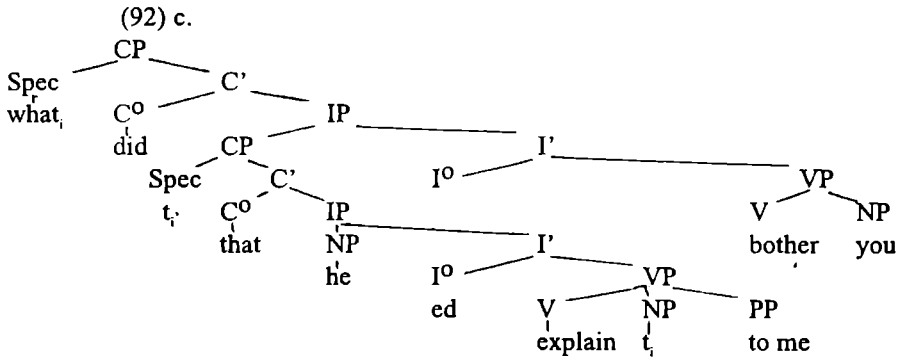
Similar considerations apply in the case of adjunct islands. Consider sentence (93), with the possible PM representation (94):

(93)*What$_i$ was Mary bothered because Peter explained t_i .

(94)
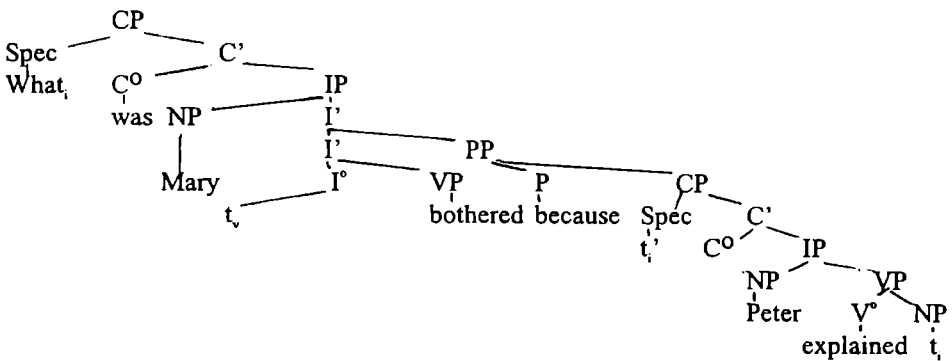
Movement to the Spec of the embedded CP is licit, and we may admit that the preposition *because*, which has full lexical meaning may L-mark the embedded CP which is not then a barrier. The PP, however, which is an adjunct and is not L-marked, is however a barrier for t_i'. The matrix IP inherits barrierhood from the PP which it dominates. Therefore, there are two barriers for ti' which exclude *what$_i$*. Subjacency is thus violated. Before we conclude this section, we ought to make sure that this theory allows unbounded movement out of complement clauses. Consider sentence (95), represented as (96):

(95) [$_{CP}$ What$_i$ do [$_{IP}$ you believe [$_{CP}$ t$_i$' that [$_{IP}$ he bought t$_i$]]]?

(96)
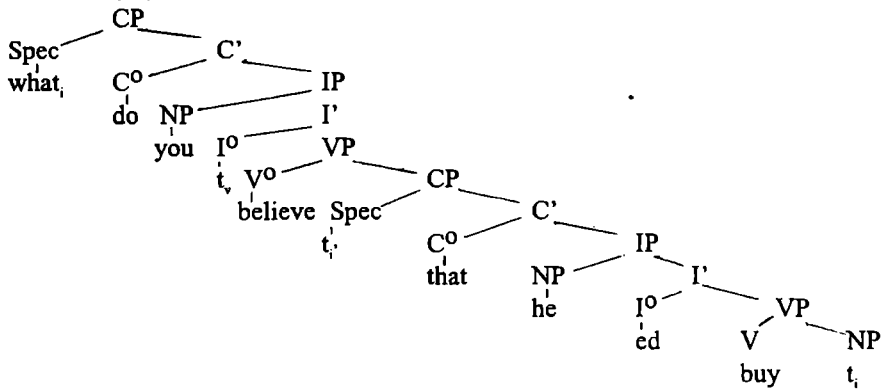
Movement from t$_i$ to t$_i$ ' is allowed, since no barrier is crossed (Remember that IP is a defective category which is not an inherent barrier.) The next maximal projection, the embedded CP is L-marked by <u>believe</u>, so that it is not a barrier. By the same reasoning, movement to the higher SpecCP is licit because no barrier is crossed.The sentence is expected to be grammatical, and so it is. The " Barriers" formulation of Subjacency can therefore predict the major strong island configurations.

6.2.The Barriers Formulation of the ECP . In the Barriers view of the ECP,just like in the earlier formulation, (66 - 67) above, there continues to be a difference between lexical government and antecedent government.

The lexical government clause in (66) is replaced by a θ-government clause, which says that a trace is properly governed if it is θ-governed, that is, if it is θ-marked by a head and it is a sister to the head.Antecedent-government is now defined as a subcase of 'government' and government is defined as in (97):

(97) ß governs α iff there is no barrier for α that excludes ß.

It is in this defintion of government that we perceive the unification of the theory of movement (subjacency) and the theory of government, since the same barrier nodes are relevant for both government and subjacency Government is a more local notion. ß is subjacent to α if there is at most one barier for ß that excludes α;that is, subjacency allows one intervening barrier. In contrast,, if ß is governed by α no barrier for ß excludes α, that is, no intervening barrier may separate the governor from the governee.The ECP is formulated as in (82):

(82) ECP

If α is a trace, α is properly governed,if and only if,

a. α is θ-governed; <u>or</u>

b. there is an antecedent ß for α such that ß governs α.

This formulation of the ECP, like the earlier one in (66 - 67), predicts the asymmetry between objects on the one hand, which are θ-governed, and subjects and adjuncts on the other hand, which are antecedent-governed. This asymmetry appears in the wh-island paradigm given in (99), only objects can be extracted out of wh-island and can undergo long movement because they leave behind a trace which is θ-governed by the verb, and therefore which is properly governed.

(99)   a.?What$_i$ do you wonder [how$_j$ to fix t$_i$ t$_j$]
        b.*How$_j$ do you wonder [what$_i$ to fix t$_i$ t$_j$]
        c.*Who$_i$ do you wonder [what$_j$ t$_i$ painted t$_j$]

(100)
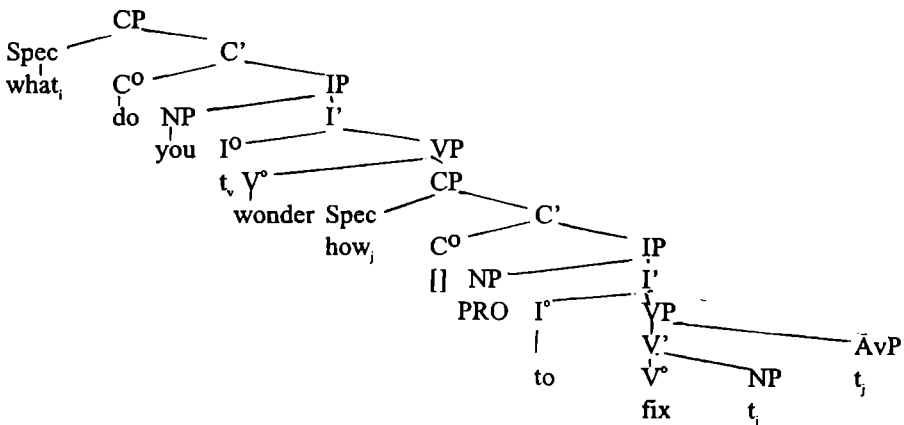
(In (99a = 100) both traces are properly governed. The adjunct trace t$_j$ is antecedent-governed by *how$_j$* in SpecCP (see 100). Since NP and IP are not barriers, there is no barrier between the trace t$_j$ and the antecedent *how*j ; *how* governs and thus antecedent-governs t$_j$. The object trace t$_i$ is also properly governed; in this case the θ-government clause of the EPC is relevant. The object trace t is θ-governed by the verb *fix*. The facts are different in (101). The object trace t is θ-governed and, in fact, also antecedent governed. However, the subject trace is neither θ-governed nor antecedent governed. It is not θ-governed since the subject NP is not a sister to the V° (as required by θ-government, cf. (84)). It is not antecedent-governed, since there is one barrier, namely the embedded CP, which intervenes between *who$_i$* and t$_i$. The embedded CP is a barrier, since it dominates IP, which is not an L-marked constituent. IP is defective, in that it does not count itself as a barrier, but it can transmit barrierhood to the CP above it. Therefore, *who$_i$* fails to govern and, therefore, to antecedent-govern t$_i$.

(101)

```
          CP
    Spec      C'
    who,  C°        IP
          do   NP        I'
               you   I°       VP
                     t,      V      CP
                        wonder  Spec      C'
                               what,  C°        IP
                                      [ ]    NP        I'
                                             t,    I°      VP
                                                   to   V     NP
                                                      paint  t,
```
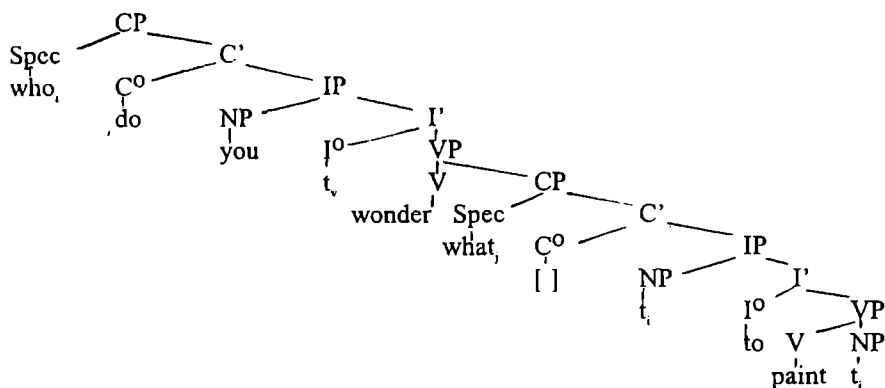
6.2.1. *That*-trace effects with subjects. A further subject/object asymmetry is illustrated in (102).

(102) a.[$_{CP}$ What, do you believe [$_{CP}$ t,' that [$_{IP}$ John bought t, in London]]] ?

b.[$_{CP}$ What, do you believe [$_{CP}$ t,' [$_{IP}$ John bought t, in London]]]?

c.*[$_{CP}$ Who, do believe [$_{CP}$ t,' that [$_{IP}$ t, bought that book in London]]] ?

d. [$_{CP}$ Who, do you believe [$_{CP}$ t ' [$_{IP}$ t, bought that book in London]]] ?

In (102a, b), each link of the wh-chain (*what,* , t, ', t,), is well-formed. The initial trace t, is θ-governed ,so that t,' properly governs t, , t,' is antecedent-governed by *what* , since it is c-commanded by *what* , and there is no barrier between them. There are three maximal projections between *what* and t, : the embedded CP, the matrix VP and IP. The embedded CP is not a barrier since the CP, an object clause, is L-governed by the verb, the VP is not a barrier since it is (finally L-marked by Inflection) and the IP is never an intrinsic barrier, therefore, there is no barrier between *what* and t,'; *what,* can therefore antecedent-govern t, '. The well-formedness of the chain (*who,* , t, ', t,) in (102d) is not surprising: t,' antecedent governs the initial subject trace t, since the only intervening IP is not a barrier ; *who,* antecedent-governs t,' by the same reasoning as above.

The ill-formedness in (102c) can only be somehow due to the intervention of *that* between t,' and t, . Nothing in the theory outlined so far predicts this situation since, just like in (102d) there is no barrier between t,' and t, , in the sense in which barriers have been defined so far. To take care of this situation, Chomsky (1986) introduces a second notion of barrier, known as *minimality barrier*. As seen in (103), roughly, a minimality barrier for some link antecedent - trace, is a lexical head X^0 which intervenes between the antecedent and the trace, that is, the trace is dominated by the first projection X' of the head. In our example, t, is dominated by the projection C' of the lexical head *that* which intervenes between t,' in Spec CP, and t, in subject position.

The definition of a minimality barrier is given in (104). Minimality barriers count only for government, not for subjacency.

(103)
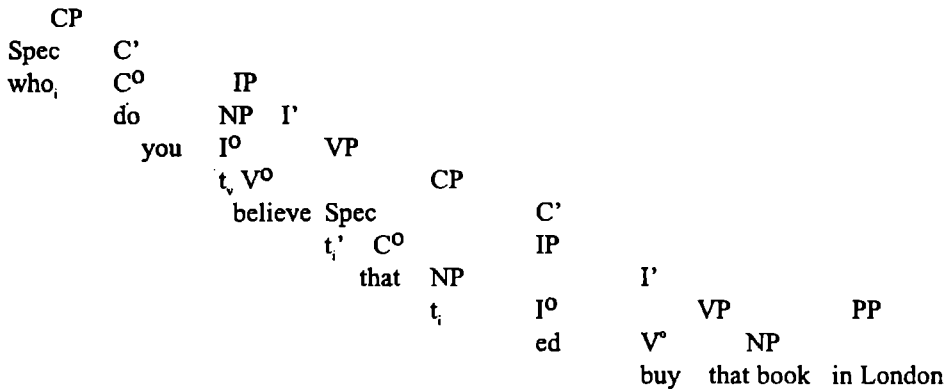
```
CP
Spec    C'
who_i    C⁰        IP
         do        NP   I'
           you     I⁰        VP
                   t_v V⁰              CP
                   believe Spec              C'
                           t_i'   C⁰         IP
                                 that   NP              I'
                                        t_i        I⁰         VP           PP
                                                   ed         V°    NP
                                                              buy   that book   in London
```

(104)   Minimality barrier

a. ß is a minimality barrier for α, iff ß is an X' (other than I'), ß dominates α, and the head of ß, X° , is lexical (X $\neq\alpha$).

b. Minimality barriers are barriers only for government.

Remark. I' like iP is a defective node and will not count as a minimality barrier.

The ill-formedness of (102c), it can now be explained as a failure of antecedent government. There is a minimality barrier for t_i that excludes t_i'; hence t_i' does not (antecedent-)govern t_i .

6.2.3.Lack of *that*-trace effects with adjuncts. But now, notice an unexpected twist in the data. We have assumed that subjects and adjuncts can only be antecedent-governed and we expect them to pattern alike. Yet, the data in (105) reveal an obvious asymmetry between subjects and adjuncts: adjuncts are not subject to *that*-trace effects. Sentence (105d), unlike the structurally parallel (105c) is well-formed:

(105)   a.Who_i do you believe [t_i' [t_i bought the book in London]]]?
         b.*Who_i do you believe [t_i ' that [t_i bought the book in London]]]?
         c.Where_i do you believe [t_i ' [he bought that book t_i]]]?
         d.Where_i do you believe [t_i ' that [he bought that book t_i]]]?

Yet, if we assume that the S-Structure of (105d)is (106), it appears that t_i is not antecedent-governed, since the minimality barrier *that* in C⁰ should block (antecedent-)government.

(106)

```
           CP
      Spec      C'
     Where  C⁰      IP
          do  NP      I'
            you  I⁰      VP
                t    V⁰    CP
                 believe Spec     C'
                       t'   C⁰      IP
                       i   that  NP      I'
                             he   I⁰       VP
                                        V'      PP
                                   V⁰    NP      |
                                   ed   buy  that book   t
                                                        i
```
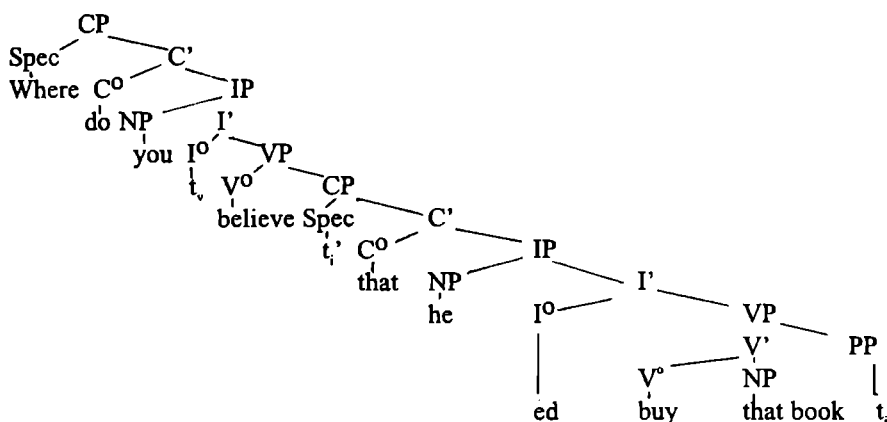
To solve this problem, Chomsky (1986a) adopts a solution initially proposed by Lasnik-Saito (1984). Basically, the suggestion is that arguments and adjuncts satisfy the ECP at different levels of representation. Moreover, it is assumed that the principle of Full Representation operates at all levels, requiring that all elements that occur in a representation of some level should be motivated in terms of the priciple of that level.

Arguments are suppossed to meet the ECP at S-Structure, i.e. the trace of an antecedent must be properly-governed at S-Structure. A trace which is properly-governed at S-Structure is assigned a feature, say [+γ] which registers that it is properly governed. An object trace is θ-governed and, thus, properly-governed. A S-Structure, the complementizer *that* may be present or absent (in English). When it is present, it blocks antecedent government of a subject trace by an antecedent in SpecCP. This is the *that*-trace effect. The subject trace may fail to be properly governed as a consequence of the *that*-trace effect.

In contrast, it is assumed that adjunct traces satisfy the ECP at the level of LF, they are not assigned a γ-feature at S-Structure but at LF. This assumption has an important consequence.If it is true that at LF only semantically motivated constituents are allowed, then the complementizer *that*, which is devoid of lexical content, *should* be deleted at LF.(There are some exception to this, which will be delat with below). So in a PM like (106), at LF, *that* (the barrier) is no longer present, and, therefore, at LF, the trace t' in Spec CP antecedent governs the adjunct trace, which can be marked (+γ). Thus, whether or not *that* is present at S-Structure, the adjunct trace is properly governed at LF, since at that level *that* must be absent. This accounts for the lack of *that*-trace effects with adjuncts. This difference between adjuncts and arguments could be interpreted as derived from the Projection Principle. Arguments, which are obligatory constituents in some sense, must be present at all levels of representation, in

well-formed constructions; hence argument traces must receive their γ marking at S-Structure, and if the trace is not properly governed, that S-Structure is ill-formed and rejected. Adjunct traces are optional constituents; so adjuncts and their traces may be checked for well-formedness at LF. Even if an adjunct trace is not properly governed at S-Structure, this does not matter, as long as the trace is properly governed at LF. The paradigm in (105) is this explained.

These are the main lines of the Barriers approach to the ECP and Subjacency. This approach is viewed as the current 'standard' analysis of these phenomena, serving as the starting point for many further elaborations, since the theory of government is the domain of intense syntactic research. Of the many post-Barriers analyses we present two. One is Rizzi's theory (in Rizzi (1990)), which develops the concept of *minimality barrier* also stressing the idea that any trace must be *governed by a head* as well as by an antecedent. The second analysis we present (Hegarty (1991)) is interesting through the type of explanation it presents: an explanation based on well-formedness conditions on chains and LF representations.

7. Relativized Minimality.

While Chomsky had proposed a disjunctive definition of the ECP assuming that a trace is either θ-governed or antecedent-governed, Rizzi (1990) insists that a trace should be both strictly governed by a head and antecedent governed. Rizzi mentions that the ECP is essentially a principle of empty category interpretation. This first requires a principle of formal licensing, which specifies in what environment a trace may occur. The suggested answer is that a trace may occur only if its *head-governed*, that is, governed by an X^0 category within the first projection X' of the head. Secondly, the content of a trace must be identified through the relation the trace establishes with an antecedent. In other words, the trace is identified by *antecedent-government*. Rizzi proposes the following conjunctive formulation of the ECP, where the first clause is a licensing clause, while the second is an identification clause.

(107)   Empty Category principle (preliminary)
         A non pronominal empty category must be:
         (i)properly head governed (formal licensing)
         (ii) θ-governed, or antecedent-governed (identification)

Rizzi convincingly argues that head government and antecedent government are independent, and independently required for the well-formedness of constructions resulting from movement. For instance. in the well-formed sentence below one will say that the VP trace is antecedent governed by t' in Spec CP, and properly head-governed by Inflection:

(108) [I asked John to go home, and [go home] I think [$_{CP}$ t' that [he did t]]]

One way of proving that both head-government and antecedent-government are needed is to show that there are cases when antecedent-government is satisfied, but head-government is not satisfied and that such sentences are ungrammatical. Let us consider such an example. English possesses a rule which allows a long, 'heavy' NP to be moved to the right end of the sentence and adjoined there. This rule is usually referred to as Heavy NP Shift. Consider now the following paradigm:

(109) a. I would like to introduce [$_{NP}$ all the students who can solve this problem]$_i$ to Mary.
b. I would like to introduce t$_i$ to Mary [all the students who can solve this problem]$_i$.
c.[$_{NP}$All the students who can solve this problem]$_i$ are intelligent.
d.*[t$_i$ are intelligent [all the students who can solve this problem]$_i$.
e.I believe [$_{IP}$ [$_{NP}$ all the students who can solve this problem]$_i$ to be intelligent].
f.I believe [$_{IP}$ t$_i$ to be intelligent [$_{NP}$ all the students who can solve this problem]$_i$].

(110)
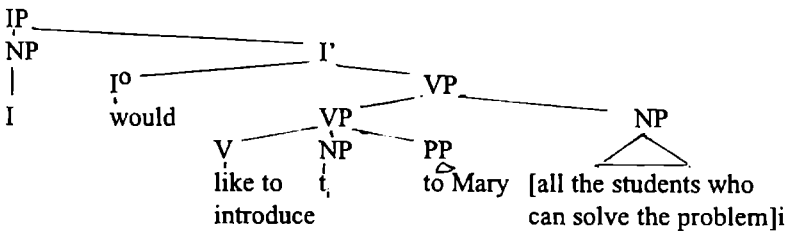
(111)
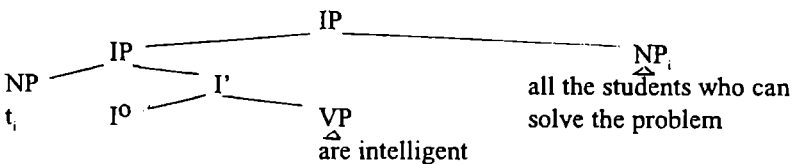
(112)
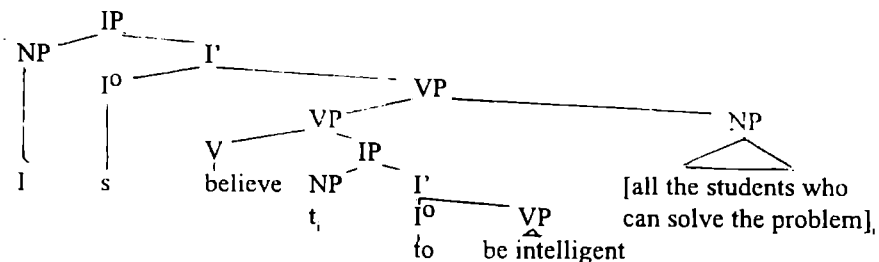
Consider (109b = 110), where the Direct Object was, correctly, heavy NP shifted. The trace left behind is properly governed: it is *head-governed* by the verb (which governs it within its immediate V' projection); and it is also *antecedent-governed* since the moved NP (which is the antecedent) c-commands it and there is no barrier for the trace which excludes the antecedent. Sentence (109d), where the subject was heavy-NP-shifted is ungrammatical. This is because the trace in subject position is not properly governed: the antecedent-government requirement is satisfied, as can be seen in (113); the moved NP c-commands the trace, and no barrier intervenes between trace and antecedent. However, the subject trace *fails to be head-governed*, since Inflection does not c-command the subject position, which, moreover is not contained within the first projection of Inflection (see (111)). Thus, antecedent-government is not sufficient, head-government must also be satisfied. The correctness of this analysis is confirmed by the fact that if an independent head governor is provided, heavy-NP-shift can successfully apply to a subject. This is exactly the case of (106f = 112), where the subject of the Accusative + Infinitive construction was heavy-NP-shifted. The trace is antecedent governed, but also head-governed by the verb in the main clause; this is, becuase the verb *believe* governs the infinitive IP clause, and thus governs both its head (the inflection *to*) and its specifier, the subject of the infinitive clause (which was heavy-NP-shifted). The idea that traces must be head-governed is incorporated in one way or another in most current analyses of the wh-construction (e.g. Law (1991), Lasnik and Saito (1992), Manzini (1992) a.o.).

7.1. Rizzi preserves the notion of subjacency barrier, defined by Chomsky as in (86) above, repeated below:

  (114) <u>(Subjacency) Barrier.</u>
      ß is a barrier for α, iff:
      a. ß is a maximal projection (and ß ≠ IP)
      b. ß is not L-marked (or not L-marked by a [+V] element)
      c. ß dominates α.

He develops and refines the idea of minimality barrier (defined in (104) above). The crucial intuition in Rizzi's analysis of minimality barriers is that a closer, potential, governor / antecedent of the relevant trace blocks the governing potential of a more distant (intended) governor/antecedent. This phenomenon is termed *'minimality effect'*, and it is relativized minimality since a certain type of antecedent government can be blocked only by an intervening antecedent of the same kind. To better understand this chain, let us remember that antecedent government is an instance of government (defined in (97) above) and thus the antecedent is a *governor*. Secondly, although in this chapter we have concentrated on wh-constructions, where the antecedent is in an A' position, therefore it is an A'-antecedent, there are other types of movement, associated with different kinds of antecedents. We have already discussed head-movement where the antecedent is an X^0 head-category; there are then rules like Passive, Raising where

the antecedent is an A-antecedent, i.e. an antecedent in an A position (*Mary was fired* t , *Bill seems* [t *to have won*]). Relativized minimality claims that only a constituent in A' position can block government of an Antecedent governor in an A' position, only an element in an A position can block antecedent-government of an intended A-antecedent, etc. Minimality effects may be viewed as conditions on chains.

Let us consider examples, starting with A' chains. Examiner the sentence below:

(115)   *How$_i$ do you wonder [which problem$_j$ [PRO to solve t$_j$ t$_i$]]?

In (115), the A' constituent *which problem* (in Spec CP) intervenes between *how*$_i$ and its trace t$_i$, in the intended chain (*how*$_i$, t$_i$). Hence j by Relativized j Minimality, antecedent government of the trace t$_i$ by how$_j$, is blocked by the closer A' antecedent *which problem*$_j$. Structurally, γ intervenes between α and β, iff γ c-commands β, but does not c-command α. Relativized Minimality can be (informally) defined as in (116).

(116)   <u>Relativized Minimality</u>:
          X α-governs Y only if there is no Z such that:
          (i) Z is a typical α-governor for Y, and
          (ii) Z c-commands Y and does not c-command X
          (where α-'governs' ranges over A'-governs, A-governs, or head-governs).

Once again, the intuitive idea is that only governors of the same kind interact. In the case of A-chains, that is, cases where the moved NP lands in an argument, in fact, in a subject position, the only relevant potential antecedent can be another, closer, subject; this is seen in (117).

(117)   a.[John$_i$ seeks [t$_i$' to be likely [t$_i$ to win]]].
          b.*[John$_i$ seems [that <u>it</u> is likely [t$_i$ to win]]].

In (117), the trace should be A-antecedent-governed by the highest subject *John*$_i$; but this does not happen; there is an intervening subject,, nanely *it,* which, under Relativized Minimality, blocks antecedent government by the highest subject.The same is true in the head chain in (118). The auxiliary *have* in C^0 cannot antecedent govern its trace, because there is an intervening, closer auxiliary which blocks government.

(118)   a. Could they t have left?
          b.*Have they could t left?

Consider now (119).

(119)   [How do you [think [$_{CP}$t' that [Bill solved t'']]]]?

Three heads (V^0, I^0, C^0) and one subject (A-antecedent) intervene between the adjunct traces (t'', t') ; however, they do not interfere with government of an A'-antecedent,

since only antecedents of the same type interact. Taking into account what has been said so far, antecedent government could provisionally defined as in (120).

(120)   Antecedent government.
X antecedent governs Y, iff,
(i) X and Y are coindexed;
(ii) X c-cmmands Y;
(iii) no (subjacency) barrier intervenes;
(iv) Relativized Minimality is respected.

7.2. Consider the conjunctive definition of the ECP again:

(121)   Empty Category Principle (preliminary)
A non-pronominal empty category must be:
(i) properly head governed,
(ii) θ-governed or antecedent governed.

Since θ-government is a kind of head-government, the formulation in (121) contains an undesirable redundancy. Rizzi (1990) argues that the notion of θ-government has become superfluous and, moreover, it makes the wrong predictions in a series of cases, where in spite of the fact that a constituent is θ-marked and θ-governed therefore, it cannot, however, be extracted. One case in point is that of lexically selected (subcategorized) adverbs (eg. *treat smb. well, behave well* etc.), which are θ-governed. As formulated in (121), the ECP predicts that selected adverbs should be extractable, because they are head-governed and θ-governed, so the trace of such an adverb is properly-governed. This prediction is not confirmed by the data, since all adjuncts (whether selected or not) cannot be extracted out of wh-islands).

(122)a. *How$_i$ did they ask you who behaved t$_i$?
b. *How$_i$ did they ask you who treated her t$_i$?

The same kind of argument is provided by the behaviour of subcategorized measure phrases. A verb like *weigh* selects either a direct object (Theme) or a measure phrase. The question in (123 c) is ambiguous admitting either (123a) or (123b) as an answer. But now notice that if *what* is extracted from a wh-island, only the Theme reading of *what* survives, since only the object, not the measure phrase, can be extracted out of the wh-island (cf. 124).

(123) a.John weighed apples. (*John*, Agent, *apples*, Theme)
b.John weighed 200 lbs (*John*, Theme, *200 lbs*, Measure Phrase).
c.What did John weigh t$_i$?

(124) ?What$_i$ did John wonder how to weigh t$_i$?

It is then possible to simplify the statement of the ECP, by eliminating θ-government from (120).

7.3. The elimination of the θ-government clause of the ECP raises, however, a problem that can be noticed by examining the following sentences again:

(125)   a. *How$_i$ do you wonder [$_{CP}$ what$_j$ [$_{IP}$ PRO to fix t$_j$ t$_i$]].
         b. What$_j$ do you wonder [$_{CP}$ how$_i$ $_{IP}$ PRO to fix t$_j$ t$_i$]].

As initially conceived, the effect of the θ-government requirement of the ECP was that of offering an escape clause for objects. Both the object and the adjunct in (125) meet the head government requirement. The object is head-governed by the verb, the adjunct is head-governed by Inflection (see PMs (100), (103), (106) above); remember that head government does not require a *lexical* head, therefore, Inflection may be an appropriate governor). Since the embedded CP is a barrier (because it dominates the non-L-marked IP), the adjunct *how* in (125a) is too far away to antecedent-govern the adjunct trace. Moreover, relativized minimality is also violated; government by *how$_i$* is blocked by the closer A'-antecedent *what$_j$* ; sentence (125a) is correctly ruled out. But for the same reasons, *what$_j$* cannot govern the object trace in (125b), either, and since θ-government has been eliminated, it is no longer very clear why sentence (125b) is grammatical.

To solve this problem, Rizzi (1990) starts by re-interpreting the distinction between arguments and adjuncts from a semantic, θ-related, perspective. He claims that there is a distinction between two types of roles: "We continue to assume that all selected elements are θ-marked. Even so, there is a clear distinction to be drawn. Some semantically selected elements refer to participants in the event described by the verb (the Agent, the Theme, the Experiencer, a.o.); other selected (subcategorized) elements do not refer to participants, but rather qualify the event (measure, manner, place). Arguments like *what$_j$* in (125) are *referential expressions*, potentially referring to participants in the event. But the grammar already disposes of a mechanism connecting referential constituents (NPs, CPs) at a distance; this is the mechanism of binding, simply requiring c-command by a coindexed antecedent.

(126) Binding
α binds ß, iff,
(i) α c-commands ß,
(ii) α and ß have the same referential index.

Elements that have referential roles (subjects and objects) may be connected to their antecedents by binding. In this reinterpretation, the essence of the ECP is the licensing clause of head government, which specifies the environments where a trace can be situated.

(127)   Empty Category Principle
         A non pronominal empty category must be properly head governed.

The relation between the trace and the antecedent is secured by distinct mechanisms.

a) *binding*, which operates only for elements or constituents that have referential roles (roughly, arguments);

b) *government*, in this case, antecedent-government, which operates for all other elements which are extracted. Government is a more local relation which may blocked by a subjacency barrier or by an appropriate minimality barrier.

In sentence (125b), *what*$_j$ has a referential role (Theme); the sentence is grammatical, since the object trace t$_j$ is head-governed and the operator *what*$_j$ is in a c-commanding position (= SpecCP) wherefrom it can bind the trace. In contrast, *how*$_i$ in (125a) has a non referential role; the adjunct trace in (125a) is head governed, but it should be antecedent governed, which it is not.

7.4. Rizzi's theory predicts that subjects and objects, rather than subjects and adjuncts pattern together, since both have referential roles. This prediction is confirmed to a great extent by the behaviour of Romanian:

(128) a.*Which student$_i$ do you wonder [how$_j$ [t$_i$ could solve the problem t$_j$]]?
       b.?Which problem$_i$ do you wonder [how$_j$ [PRO to solve t$_i$ t$_j$]]?
       c.*How$_j$ do you wonder [which problem$_i$ [PRO to solve ti tj]]?

(129) a.*Which student$_i$ do you think [t$_i$ that [t$_i$ could solve the problem]]?
       b.Which problem$_i$ do you think [t$_i$ that [Bill could solve t$_i$]?.
       c.How$_i$ do you think [ti that [Bill could solve the problem t$_i$]]?

(130) a.Ce student$_i$ nu știi [cum$_j$ [$_{IP}$ a rezolvat t$_i$ problema t$_j$]]?
       b.Ce problema$_i$ nu știi [cum$_j$ [$_{IP}$ vom rezolva t$_i$ t$_j$]]?
       c.*Cum$_j$ nu știi [ce problemă$_i$ [$_{IP}$ vom rezolva t$_i$ t$_j$]]?

The examination of these examples reveals the following: It is true that, in English, subjects and adjuncts pattern alike in wh-island cases; in the sense that neither can be extracted. But beyond this, subjects and adjuncts behave differently even in English. In declarative object clauses (sentences (129)), adjuncts can be extracted, while subjects cannot be extracted because of the "*that*-trace" effect. In Romanian, there is no "*that*-trace" effect - and this calls for an explanation - so that in declaratives all elements can be extracted (cf. (131) below))).

(131) a.Ce student$_i$ crezi [t$_i$ că [va rezolva t$_i$ problema]]?
       b.Ce problemă$_i$ crezi [t$_i$ că [vom rezolva t$_i$ împreună]]?
       c.Cum$_i$ crezi [t$_i$ că [vom rezolva problema t$_i$]]?

On the other hand, in Romanian wh-islands, subjects and objects pattern alike, both can be extracted, unlike adjuncts.

We have already explained the behaviour of adjuncts under Rizzi's formulation of the ECP; they are head governed by the Verb (if they are subcategorized

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constituents) or by Inflection, and they must also be antecedent-governed. Subjects exhibit the reverse problem, in some sense. Since they are arguments and have referential roles, they may be related to an antecedent by Binding, which is a more permissive relation than (antecedent-)government. However, the difficulty of the subject position is that often it is not head-governed, so that the licensing condition of the ECP is not met. This is the case of the SpecIP position of the subject in English (cf. 132). The subject is the specifier of Inflection, therefore, it is not governed by inflection, in its immediate Inflection' projection. The subject could be governed by an appropriate element in C^0, since C^0 does govern the subject position in its immediate projection C', in (132).

(132)

C'
C^0 IP
that/∅   NP   I'
             I^0 VP
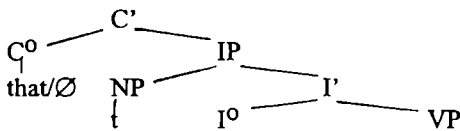
Complementizers like <u>that</u> in English are, however, inert for government; thus, in Rizzi's analysis, the subject position fails to be head-governed, whence the "*that*-trace" effect (in (112a)). In this analysis, languages exhibit a variety of strategies of providing a head-governor for the subject, so that the subject can be or become extractable. Let us examine a few of them below:

7.5. There appear to be three major strategies which allow subject variables to be governed, and, therefore, which allow the extraction of the subject. First, in languages in which the position of the subject enjoys a certain amount of freedom, extraction of the subject can take place from a position in which the head government requirement is fulfilled. A case in point is Romanian. We know that in Romance languages the verb always raises to Inflection. At the same time, it has been argued that in Romanian the Nominative Case is assigned under government by (the Verb +) Inflection, in the basic position of the subject, as in (133).

(133)

I'
I^0 VP
V^0 I^0 NP   V'
                      V^0 NP
          |__Nom__↑ t_v
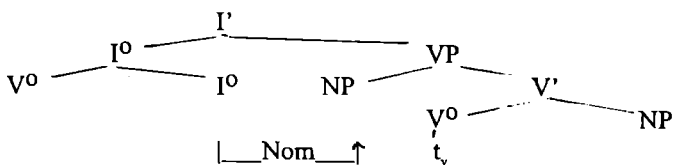
One argument for this position is that there are clauses (e.g. infinitival clauses) where the subject can only appear post-verbally (e.g. (134)).

(134)   a. Este frig în cameră.
         b. Lui Ion i-e cald.

c. Inainte de a veni el la noi.
d. *Inainte de el a veni la noi.

The position of the subject in (133) is head-governed by Inflection (or by V^0+I^0). We may assume that in wh-movement construction, the subject is extracted from this head-governed position. This explains the lack of subject / object asymmetries in Romanian:

(135)   a. Cine$_i$ nu știi sigur [când [se întoarce t$_i$ de la Paris]] ?
        b. Ce$_i$ nu știi sigur [când [a cumparat Ion t$_i$ de la Paris]].?
        a. Cine$_i$ nu crede nimeni [t$_i$ ca [se mai intoarce t$_i$ de la Paris]].?
        b. Ce$_i$ nu știe nimeni [t$_i$ că [a declarat Ion t$_i$ la Paris]].?

In other Romance languages, like Italian or Spanish, the Nominative is assigned in the ungoverned Spec IP position, but the subject can be freely moved and adjoined at the right end of the VP, i.e. there is Free Inversion of the subject. This rule operates in Romanian as well.

(136)   Italian   a.Credo [che [$_{IP}$ t$_i$ ha [[telefonato]$_{VP}$ Gianni$_i$]$_{VP}$]].
                (I) believe [that[has telephoned Gianni
                b.Non so [$_{CP}$ se [$_{IP}$ t ci potra [[$_{VP}$ aiutare] Gianni]$_{VP}$]
                (I) don't know [if us will be able to help Giovanni
        Romanian c. Nu știu dacă va putea să-i ajute pe copii acest profesor

If in such sentences the subject is adjoined to VP, then it can be assumed that this is the position wherefrom the subject is extracted; the position is head-governed by Inflection, and this explains why the subject is freely extractable in such languages (cf. 120)).

(137)


```
                IP
      NP             I'
      pro_i       I⁰        VP
            ha        VP          NP
                   telefonato   Gianni_i / t_i
```
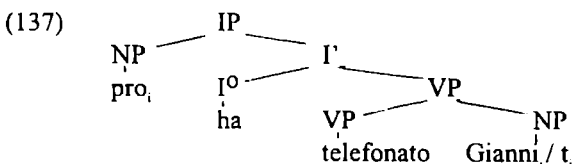
(138)   a. Chi credi che ha telefonato ?
        b. un homo che non so se ci potra aiutare

A second possibility for subject extraction is that C^0 is or can be turned into a governor. Rizzi claims that the most frequent strategy of turning C^0 into a governor is the Agreement in COMP phenomenon, which will be explained below. Consider configuration (139) again. The wh-phrase originates in subject position, and there is Specifier-Head agreement between the wh-subject and Inflection, which share the features of person, number (sometimes gender, too). Subsequently, the wh-phrase moves to the Spec CP position. An important aspect of the theory of agreement is that two constituents which are in the Specifier-Head configuration may undergo Specifier-

Head Agreement only if they share or can share features. Thus, a wh-phrase in SpecCP may agree with C^o only if C^o is in principle capable of carrying features like person, number,namely, only if C^o is an agreeing C^o. *That* in English *questions*, is not an agreeing C^o, for instance. If C^o is an agreeing complementizer, then the subject phrase in SpecCP may cause Spec-Head agreement. C^o acquires pronominal features and may function as a head-governor for the *subject trace*. Of course, C^o is in a position where it can head-govern the subject (it c-commands the subject in the C' projection). The Agreement in Comp phenomen consists in the fact that a C^o may acquire pronominal features through agreement with a wh-phrase in its specifier, and may thus be turned into an appropriate governor for the subject whose features it has acquired. In fact C^o indirectly agrees with I^o, through Spec-Head agreement with the former specifier of I^o.

(139)

```
              CP
       _____/  _____
     Spec              C'
    wh-NP_i      _____/ _____
    [α number]  C^o              IP
    [β person]  [α number]    __/ \____
                [β person]   NP        I'
                             t_i    __/ _____
                                   I^o           VP
                                   [α number]
                                   [β person]
```
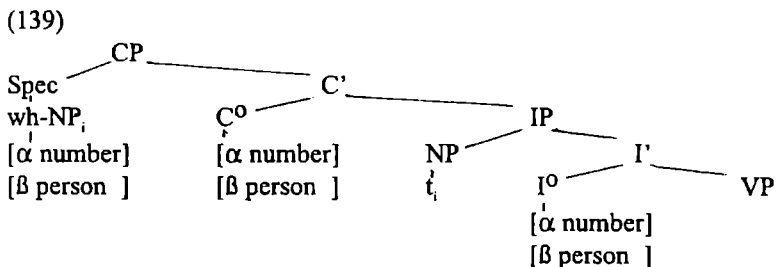
Such an analysis is strongly suggested and supported by the existence of languages which overtly show complementizers agreeing with an extracted embedded subject. An example is French in examples of type (130) below. Notice the subject object asymmetry in the choice of the complementizers (in 140 a-b, c-d). Moreover, notice in (140e) that *qui* may occur only next to the subject gap, that is, only in configuration (139).

(140) a. Qui crois-tu [$_{CP}$ que / *qui Jean a vu t] ?
b. Qui crois-tu [*que / qui [t chante]] ?
c. L'homme que je crois [t que / *qui [Jean connaît t]].
d. l'homme que je crois [t qui [t viendra]].
e. l'homme que je pense [t que / *qui [Jean croit [t qui [t viendra]]]].

Thus, when an object is extracted (140a,c), the selected C^o is *que*. When the subject is extracted (140b,d,e), *qui* must be employed. In terms of this analysis, this alternation between *que / qui* is the morphological reflex of the application of the Specifier-Head agreement between a wh-phrase or wh-trace and the C^o element. More precisely, *qui = que + Agr* features. The agreeing C^o *qui* may occur only next to the initial trace (in configuration (139)), since only in that position it can finally acquire the features of the Inflection node. In higher clauses, Inflection agrees with the subject of these higher clauses (cf. example (140 e)). Consider now the following English examples:

(141)   a. *Who$_i$ do you think [t$_i$ [$_C$' that [t$_i$ left]]] ?
        b. Who$_i$ do you think [t$_i$ [C' Ø [t$_i$ left]]] ?

It looks as if the null complementizer may function as an agreeing complementizer in indirect questions, since it is capable to license a subject trace; this supposition would account for the well-formedness of (141b); the null complementizer would head-govern the trace, so that the subject trace is properly-governed in (141b), but not in (141a), where *that* cannot carry agreement features. To implement this idea, Rizzi suggests that in English tensed sentences, C^O may be rewritten either as *that* (C$^°$-->that), an element which is inert to government, or as an abstract formative Agr (C$^°$-->Agr), which may acquire features by Spec-Head agreement, turning into a governor. We here end the presentation of the Agreement in Comp phenomenon.

The most radical way of eliminating an ungoverned subject trace is the insertion of a resumptive pronoun in the position of the extracted subject; this can be a particular instance of a generalized resumptive strategy (in wh-constructions and other movement constructions), or more interestingly a specific rule for the subject position. An example of the latter type is that of Swedish.

Engdahl (1985: 8) reports that the use of subject resumptive pronouns is fully grammaticalized in Swedish in structures in which an ECP violation would otherwise arise.

(142)   Vilket ord visste ingen [$_{CP}$ hur [$_{IP}$ det /*t stavas]]?
        Which-word-know-no one-[how [it /*Ø - is spelled]]
        'Which word does no one know how to spell ?'

While the resumptive pronoun is obligatory in the above sentence, which illustrates extraction of a subject out of a wh-island, the example below show that resumptive pronouns are marginal or impossible in other positions, including the subject position of embedded clauses with a null C^O, where a subject trace is allowed, presumably by a mechanism analogous to the corresponding English structure.

(143)   a. Kalle$_i$ kan jag sla vad om [t$_i$ / *han$_i$ kommen att klara sig].
        Kalle can I bet about [t / he is-going-to succeed]
        I can bet that Kalle is going to succeed.

Before concluding this presentation of Rizzi's system, we once more mention those of its features which proved to be particularly relevant in the analysis of extraction phenomena in different languages, these are the following: a) the idea of relativized minimality itself, i.e. the fact that the governing potential of some governor can be blocked only by a closer governor of the same sort; i.e. an A' antecedent can block government by a more remote A' antecedent, etc; b) the ideea that constituents that have referential rqles (= arguments) behave differently under extraction form constituents that have non-referential roler (roughly, adjuncts); this idea was further

developed in Cinque (1990) and Manzini (1992); c) the idea that traces need to be *head-governed* (as well as antecedent governed or bound).

8 Government Theory.

Having reviewed some aspects of the theory of movement, let us sum up the results on the notion of government:

(144)   Government

It is said that α governs β iff α c-commands β and there is no category γ that 'protects' β form being governed by α. γ protects β in this sense, if it is c-commanded by α ,and either i) or ii) is true:

(i) γ is a barrier dominating β;

(ii) γ intervenes between α and β (the minimality condition)

Government appears as a local form of c-command. Two elements of locality went into the definition of government.Government is blocked by certain barriers, and, secondly, government is blocked by an intervening category of the appropriate kind, namel by a closer governor of the appropriate kind (the minimality condition). These ideas have considerable descriptive adequacy, but, as remarked by Chomsky and Lasnik (1991:52), they"lack the generality and clarity that we would hope to find in an explanatory theory of language".

Examine the minimality condition again, illustrated in examples (145) below. Movement of a head is blocked by an intervening head(145a), movement of an arguement(a subject/object) to another argument position (a non-thematic subject position, see next chapter) is again blocked only by an intervening subject (145b), while movement of an (adjunct) phrase to a non-argument position (SpecCP) can only be blocked by another phrase in a non-argument (SpecCP) position (example(145c)):

(145) a. He has been reading it.
*Been he has t reading it?
Has he been reading it?

b. It seems that it is likely that he will win the presidential race.
*Who$_i$ seems that it is likely [t$_i$ to win the presidential race]?

c. *How do you wonder [t what$_i$ PRO to fix t$_i$ t]?

The basic intuition, generalizing over the data in (145) is that the operation Move α should always try to construct "the shortest link", i.e., it should always move X° or XP to the closest appropriate target position. If some legitimate target of movement is occupied, the cost is deviance, as shown by the examples above. The idea is to regard this as part of a general principle of *economy of derivation, a functional principle,* therefore.The intervention constraint (i.e. the idea of relativized minimality) can be derived from, and replaced by, coniderations of economy of deriavtion. A

functional reformulation of the intervention constraint might be (146) below (cf.Chomsky and Lasnik ,1991:58):

> (146)   Minimize chain links.

If this approach is viable, one can eliminate the intervention condition of (144ii), in favour of this general conditon on economy of derivation, restricitng the definition of government to (147):

> (147)   <u>Government</u>
> α governs β, if α c-commands β and there is no barrier for β c-commanded by α.(cf Chomsky-Lasnik 1991, 58).

Thus, an important idea that has emerged from recent linguistic research is that of the "*functional design of languages*" *and grammars*. One manifestation of this functional design is the assumption of a principle of economy of derivation. There is also a pinciple of economy of represenatation (cf. also ch...above), which requires that all the elements in a representation of some level should be justifiable in terms of the principles of that level. Only certain entities are legitimate objects of some level; for instance, a [+low, +high] vowel, or a stressed consonant cannot qualify as legitimate objects of the phonlogic/phonetic representation(PF). One may likewise impose conditions on legitimate LF objects.Specifically, Chomsky (1990) suggests that a chain $C = (a_1...a_n)$ is a legitimate LF object only if it is uniform, i.e., only if all of its memebers are alike with respect to some property P. The relevant property P is whether or not all the memebers of a chain appear in an A- or in a A'- position.

9.One more analysis of the ECP.The increased role of LF. The functional design of languages

The last analysis of the ECP presented here, that of Hegarty (1991), makes full use of the uniformity condition on chains . Hegarty's analysis shows how the grammar evolves towards being more and more a representation of the relation between sound and meaning. The most important (ideally: the only) levels of representation should be Phonological Form and Logical Form with a mapping relation between them (cf. Chomsky 1992).The existence of LF and PF is beyond dispute, since these are the external interface levels,that is, the points where grammar is embedded in the performance systems;(the articulatory-perceptual system, and the conceptual-intentional system).

The idea is to cut down on the chains that can be derived in the course of a derivation, by assuming that all chains at LF must be uniform in the occurrence of A, A' positions within the chain. Without such a condition, the inventory of movement chains derived up to LF would be as in (148).

> (148)   a. (X°, X°,..., X°) head movement (e.g., Verb Raising to Inflection)
> b. (A, A,..., A) A- movement (e.g., Passive(He, was seen t,), Subject to Subject Raising (He, appears t, to have left)

c. (A', A',..., A)   A'- movement of an argument
d. (A', A',..., A')   adjunct movement.

The inspection of (148) shows that all the derived chains are uniform except (148c). In order to make (148c) uniform, it is proposed that all intermediate traces delete at LF yielding the structure (A', A), an operator-variable chain. The operator-variable structure must be included in any inventory of legitimate LF structures, given the semantic importance of this basic logic structure; consequently, the position of the operator is exempt from the condition of uniformity. On this assumption, (A', A) will count as a uniform chain. The legitimate chains at LF are then the following:

(149)   a. $(X^\circ, X^\circ,..., X^\circ)$ head movement
         (e.g. Has he $t_\circ$ been around for a long time?
         b. (A, A,..., A)   A- movement
         (e.g., $[_{IP}He_i$ appears $[_{IP} t_i$ to be likely $[t_i$ to leave soon])
         c. (A', A) A'-movement of an argument
         (e.g., What do you hope [PRO to get t_i from him]
         d. (A', A',..., A') adjunct movement.
         (e.g., How$_i$ do you believe $[t_i$ that he managed [PRO to get it t_i)

9.1. The ECP again. Hegarty's analysis achieves a considerable simplification of the Barriers system, which it assumes as a starting point.(A disjunctive formulation of the ECP is assumed:a trace is properly governed iff it is θ-governed, OR if it is antecedent-governed.) In particular, it is still assumed that traces should be assigned a [±γ] feature which checks their well-formedness with respect to the ECP;i.e., it checks whether they are properly licensed. In contrast with the Barriers system (which required all *arguments* to be [+γ] at S-Structure),in the present analysis, argument traces may be checked for well-formedness *either* at S-Structure *or* at LF.Remember that chains of A'-moved arguments look different at S-Structure and LF, since at LF, the intermeduate traces are deleted to satisfy the condition of uniformity.Chains which were not well-formed at S-Structure, because an intermediate trace failed to be properly governed, will be well-formed at LF, where the offending trace is deleted; it is enough that the initial trace should be properly licensed. Adjunct chains are already uniform at S-Structure, no intermediate traces will delete, therefore, the null assumption is that no marking is necessary and adjunct traces should satisfy the ECP at LF.

One important detail is that, at least at S-Structure, the VP is considered to be a (subjacency) barrier (= a maximal projection which is not L-marked). Barrierhood of the VP may be circumvented by adjunction to VP, since in that case, the trace is no longer dominated by VP. Rmember that α dominates β only iff all segments of α dominate β. The first assumption on LF representations that we introduced was then (150):

(150)   Chains must be uniform at LF. Therefore, intermediate traces of A'-moved arguments are deleted in the mapping from S-Structure to LF.

Assumption (150) immediately allows the elimination of θ-government, the escape clause which allowed long movement of the object. To see how this is possible, let us start with an example that need not include long movement; sentence (151) has S-Structure (1152).

(151)   What$_i$ do you think [$_{CP}$ t$_i$'' that [$_{IP}$ John [$_{VP}$ t$_i$' [$_{VP}$ bought t$_i$]]]?

(152)
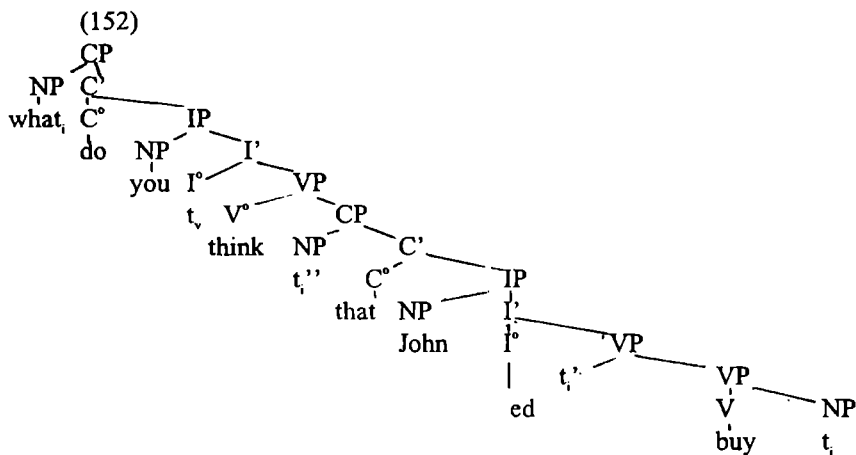
The VP adjoined trace t$_i$' antecedent governs the initial trace t$_i$ (there are no barriers between them). Since t$_i$' must delete in the mapping to LF in order to produce a uniform object at LF, namely the operator-variable chain (what$_i$, t$_i$), there are no antecedent government requirements on t$_i$' itself. Given that t$_i$' γ-marks t$_i$ at S-Structure, so as to keep a record of the licitness of t$_i$ at LF, where t$_i$' is missing, it follows that lexical government of t$_i$ is not required. This allows the disjunction between θ-government and antecedent government in the formulation of the ECP (in Barriers) to be eliminated in favour of antecedent government exclusively. The only link that matters in the argument chain is the first, which establishes whether the initial position of the trace is licit. The same is true when extraction out of wh-islands is involved, that is, when long movement of an argument occurs.

(153) ? What$_i$ does John know [$_{CP}$ who$_j$ [t$_j$ [$_{VP}$ t$_i$' [$_{VP}$ bought t$_i$]]].

In this example, it is more obvious why θ-government is no longer needed; t$_i$'(=the VP-adjoined trace) antecedent governs t$_i$ and can assign it the [+γ] feature. But *what* does not antecedent govern t$_i$', since there is one barrier between them (the embedded CP, inheriting barrierhood from the non L-marked IP). Nevertheless, the ill-formedness

the (what$_i$, t$_i$') link no longer matters, since t$_i$' is deleted before LF. The only remaining trace, t$_i$, is licensed at S-Structure by antecedent government.

9.2. A second LF assumption that has great explanatory force is (154).

(154)   The Principle of Full Interpretation (FI). All elements present at LF must play an LF role.

To become aware of the relevance of this principle, we shall examine adjunct extraction out of factive complement clauses. It has been shown that adjuncts are generally extractable out of declarative complements.

(155)   Where$_i$ did you say [that you met him t$_i$]$_{CP}$

The adverbial *where* can be construed with the lower clause , as indicated by the indexing in(155).There is in English, however, a clear contrast between propositional verbs (*assume,believe, say, suppose, suspect, imagine, claim,*etc), and factive verbs and adjectives (*regret, realize, deplore, forget, mention, point out, surprise, be sorry, be tragic*, etc,), with respect to adjunct extraction.The point is that adjuncts cannot be extracted out of factive complements:

(156)   *Where$_i$ did you regret that you met him t$_i$?

Factive verbs are those which presuppose the truth of their complement clauses; the complement clause stays true , whether the main verb is asserted or denied.Propositional verbs, in contrast, tell nothing about the truth or falsity of the complement clause, as can be seen by comparing the following sets of examples:

(157) a.John regrets that his brother is a genius.
(→John's brother is a genius.) *(regret* is factive)
b. John does not regret that his brother is a genius.
(→ John's brother is a genius.)
c.Bill is sorry that his son turned to linguistics.
(→Bill's son turned to linguistics.) (*sorry* is factive)
d.Bill isn't sorry that his son turned to linguistics.
(→Bill' s son turned to linguistics).

(158) a.John believes that his brother is a genius (...but no one else does.)
(*believe* is a propositional verb)
b.John doesn't believe that his brother is a genius (...and we all suspect he is right).

Thus, with *regret, be sorry*, the truth of the CP is taken for granted, and it is in no way affected by the truth or falsity of the main verb. The CP is a fact of the real world;(whence the name "factive " verb). With *believe*, and, generally, with propositional verbs, the truth value of the CP in the real world is not determined.

As already announced, adjuncts cannot be extracted out of factive complements, even though they can be moved out of propositional complements; here are more examples:

(159)   a.He mentioned that the work had been done carelessly.
           b.*How$_i$ did he mention that the work had been done t_i?
           c.She resented that he had reacted so violently. ·
           d.*How$_i$ did she resent that he had reacted t_i?
           e.He said that the work had been done carelessly.
           f.How$_i$ did he say that the work had been done t_i?

This contrast in the behaviour of adjuncts derives from the different semantic properties of factive/ prepositional complements, which lead to different LF representations for factive and propositional complements, respectively.

A factive complement has the status of a *discourse presupposition*: The basic intuition that the formalization should capture is that the event / fact expressed in a factive CP is independent from the one expressed by the main clause; the factive CP is "discourse bound". , Hegarty(1991) proposes that in such cases, the event variable of the CP is bound by the complementizer *that* , which acts like an operator, more exactly, an iota-operator *(the)*. We have repeatedly stressed that the event variable in the grid of a verb is bound by the Tense morpheme in Inflection, a fact which semantically justified the V-to-I Movement. For example, assuming that the verb *see* has the θ-grid $< 1,2,e >$, where e is an event tθ-position, in a root clause such as *Mary saw Tom*, the event position of the verb is projected with the θ-grid to the VP node, where it is discharged by θ-binding by a tensed Inflection; abstracting away from other θ-roles in the θ-grid, this process is represented in (160). The empty brackets $< >$ accompanying a node indicate that the event position has been discharged below that node:

(160)   [$_{IP}$Mary [$_{I'<>}$ [$_{I_o}$ [+Tns]] [$_{VP<e>}$ see Tom]]]

In semantic composition, the θ binding by a [+Tns] I° introduces existential quantification:

(161)   ∃e see (Mary, Tom, e)

The interpretation of an embedded clause is always determined by the semantic properties of the verb in the main clause; even the contrast between factive CPs and propositional CPs follows from the contrast between factive verbs and propositional verbs. To capture this empirical fact, we will assume that in subordinate clauses I° does not discharge the event position any more. Discharging the event position is a function of I° only in root clauses. The event variable of a complement clause will then propagate higher up in the clause, beyond I° to the IP level, and then even higher up,

depending on the semantics of the main verb. For factive verbs, we may assume that the complementizer discharges the event position of the clause at IP, as shown in (162):

(162)   a.John mentioned that Max visited London (factive)

b.mention[$_{CP<}$,that[$_{IP<e>}$Max[$_{I'<e>}$I°[$_{VP<e>}$visit London]]]]

The semantic role of the complementizer that is analogous to that of a definite article which would bind the event variable. As known, the definite article carries a presupposition of existence. Cf. (Strawson (1950), Horn (1971)a.o.). With respect to some given discourse, a sentence like Open the door presupposes the existence of a door. Similarly, as long as the event variable of the factive complement is assumed to be identified by a definite operator (i.e., the complementizer that), it will be presupposed that the event occurred (it existed). Thus, examples like (163) with the factive verbs regret, forget may also be interpreted as suggested in (164).

(163) a.John regretted that Bill killed the cat.
b.John forgot that Bill killed the cat.

(164) a. John regretted that the event in which Bill killed the cat occurred.
b. John forgot that the event in which Bill killed the cat occurred.

This is how binding of the e-variable by a complementizer accounts for the presuppositional status of the factive complement. It is also apparent that the main verb does not "interfere" with the interpretation of the complement. Turning to prepositional complements now, consider (165):

(165)   John believes that Max visited London.

In this sentence, there is no presupposition that the event (state) described in the complement clause occurred (holds). Sentence (165) is true just in case the propositional complement is true in John's "belief worlds", in his mental model of the world cf. Johnson Laird (1983). An interpretation of (165) can be formulated along the following lines:

(166)[$\exists e \in M_E$ visit (Max, London, e) believe (John,e)]
M = John's mental model
M_E = the set of events in M

In other words, (166) asserts that there is an event e in John's mental model, and that John stands in a belief relation to that event in his mental model. The semantic interpretation of (165) presupposes the semantic composition of the main verb (believe) with thw event variable in the embedded clause. To capture this intuition formally, it will be assumed that the event variable of the CP is discharged by the main verb, as shown in (167), not by the C° , which plays no semantic role.

(167) believe [$_{CP<e>}$that[$_{IP<e>}$Max[$_{I'<e>}$I°[$_{VP<e>}$visit London]]]]

Furthermore, it is assumed that the discharging of the event position by a propositional predicate like *believe, claim*, etc., effects existential quantification over the mental model of the world held by the subject of the main verb (John, in example (165), structure (167) yielding representation like (166) above.

In sum, while the complementizer is actively involved in the semantics of factive complements, binding the event variable for the CP, Co plays no part in the semantics of propositional complements.

FI predicts that at LF, C° cannot be deleted in case of factive complements, because C° discharges the event variable of the complement, and thus has a semantic role to play; in contrast, C° plays no role in the semantics of propositional complements; since only elements thsat have a semantic role are present at LF, that will bne deleted at that level from the representation of propositional complements.

9.3. Let us return to the theory of extraction and spell out the following assumptions regarding the interpretation and syntax of adjuncts cf. Hegarty (1991)

Assumption 1 Adverbial wh-elements have an event θ-position (cf. also chapter 8 above, and construal of the adverbial wh-element is by θ-identification of this event position with that of the modified clause.

Assumption 2 There is no antecedent government across a C°.There can be antecedent government across C°, when C° contains no element.

This assumption captures the effect of the Minimality Condition in *Barriers,* as it applies to the C° system.

Assumption 3 An overt complementizer that is optional may delete at LF. An overt complementizer which is obligatory may not delete at LF.

It is hypothesized that complementizers are obligatory when they play a role at LF. In factives, C° has an LF role, since it discharges the event position of the complement clause. This is why the complementizer C° cannot be deleted with factive complements. In (most) propositional complements, the complementizer is optional (in English), it plays no semantic role, and it will not be present at LF. Under thee assumptions, it is easy to understand why adjuncts may be extracted out of declarative complements, though not out of factive complements, if one compares the LF representations (168c,d) of examples (168a,b) below:

(168)a. Why do they believe [t'(that) Mary hired Bill t] ?
b. *Why did they forget [t' that Mary hired Bill t] ?

a.'[$_{CP}$why do[$_{IP}$they believe[$_{CP<e>}$t'[$_{IP}$Mary[$_{VP<e>}$[hired Bill]t]]]
----

b.'[$_{CP}$ why did [$_{IP}$ they forget[$_{CP<e>}$t' that[$_{IP<e>}$ Mary[$_{VP<e>}$[hired Bill]t]]]]]

In (168a), the complementizer *that* (which plays no semantic role), is deleted, according to FI; consequently, t' antecedent- governs the initial trace t of *why*. Assuming the movement chain indicated in (168a.a'), the event position of *why* can θ-identify, through the initial trace t, with the event position of the lower verb, contained in the θ grid of the verb, which is projected up to VP. The resulting event position then propagates to the lower CP node, where it is discharged in semantic composition with the propositional verb *believe*. In sum, the wh-adverbial can be construed with the lower clause in the case of propositional verbs.

Examinig representation (168a') again, it appears that since the event variable e of the embedded clause goes up to the CP level undischarged, it is not critical that the trace t' in Spec CP should antecedent-govern the critical trace t. In fact, *why* can also be construed with the lower clause, through the intermediate trace t', since there may be θ-identification of t' and the event variable e of thev lower predicatre, when both of them are in the complementizer projection:

(169) $[_{CP}$ why do $[_{IP}$they say$[_{CP<e>}$t'$[_{IP<e>}$Mary$[_{VP<e>}$[hired Bill]t]]]]]
|------|

For propositional verbs in English, two modes of semantic composition are thus available: the event variable may combine with the adverb inside the lower IP, and then it matters that the initial trace t, in the chain above, should be antecedent-governed by t', because the initial trace should be properly licensed; alternatively, combination of the adverbial trace with the event variable takes place in the C° projection (see representation (169) above).

The existence of this second mode of semantic composition explains why adverbials can be extracted out of propositional complements even in languages like Romanian, French a.o., where complementizers do not delete.(Remember that by Assumption 2, there is no government across an overt complementizer.) Here is one example:

(170)a.   De ce crezi că Maria l-ar angaja pe Ion t ?
|--|

b. $[_{CP}$De ce[crezi$[_{CP<e>}$t'că$[_{IP<e>}$Maria$[_{VP<e>}$l-ar angaja pe Ion]t]]
|------|

The expected contrast between English, on the one hand, and French, Romanian (i.e., languages where the complementizer is not deleted) re-emerges when there is multiple embedding, since the e variable does not go further than the first CP; it becomes critical, at this point, that each trace in the chain should be antecedent governed. Here are examples due to Hegarty (1991):

(171) E   a. Why does John think [t"(that) Mary said [t'(that)Bill was fired t ?
          b.Why did John suggest [t"(that)Mary claimed [t(that)Bill
          assumes[t'(that)Linda was fired t]]] ?

F   a. Pourquoi penses-tu que Bill est parti t ?
            b.*Pourquoi penses-tu que Marie a dit que Bill est parti t ?

R   a. De ce crezi că Bill a plecat t ?
            b.*De ce$_i$ crezi că a spus Maria că Bill a plecat t$_i$?

Consider now the factive representation (168b'), repeated below for convenience:

(172) [$_{IP}$Why did [$_{IP}$they forget[$_{CP<s>}$t' that[$_{IP<e>}$Mary[$_{VP<e>}$[hired Bill]t]]]]]

By Assumption 2, t cannot be antecedent governed by t' across the complementizer that, which cannot be deleted. Moreover, the event variable of the lower cxlause is bound at IP level by the C° that, so that no combination of the trace t' with the event variable e is possible (inside the C° projection). Consequently, the adverbial cannot be extracted from factive complements in English. Adjunct movement out of factive complements is equally impossible in French or Romanian:

(173) *De ce$_i$ regreți că l-au angajat pe Ion t$_i$?

CONCLUSIONS   1. The assumption that the ECP operates at LF, in conjunction with the requirement regarding the uniformity of chains affords a considerable simplification of the analysis.

         2. In this chapter, it has been shown that all module regarding semantic interpretation (e.g., Binding Theory, Control Theory) ultimately operate at LF, an interface level which is conceptually obligatory.

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Chapter 12

CASE THEORY. A-MOVEMENT

1. The domain of Case-Theory. Abstract case as a syntactic notion.

Case Theory is another important module of the grammar. It has often been stressed that case differs from the inherent nominal categories of gender and number in being a contextual or relational category. A DP[or NP]'s case feature [α Case] is a reflex of the DP's position and function in the sentence. Case is a morpho-syntactic means of registering on the DP its semantic (in fact, thematic) role and its syntactic function, and also of indicating its dependence on some category that assigns case (a verb, a preposition, etc). A generally valid principle is that *Case is assigned under government* by the case-assigner. To quote Emonds (1985), "case marking is the distinguishing by means of a grammatical formative (inflection, preposition) of the various NPs in structurally different positions in a maximal phrase."

What has been said so far already shows that Case theory is concerned with two types of problems: *case-assignment* and *case-realization*. A general statement of Case Theory is that any DP, in fact any phonologically realized DP must be assigned some case, which registers its structural position and makes it interpretable semantically. Therefore, any lexical DP (i.e. any phonologically real, non-empty) DP is assumed to bear an *abstract case feature*. The syntactic aspect of the case module is primarily the theory of *case-assignment*; the theory accounts for the way in which different DPs acquire an abstract case feature. The theory shows what categories can assign case and how they do it, what positions in a sentence count as case-positions, at what syntactic level case is assigned, what configurations lack case-marked positions, what happens to case under movement, etc.

The basic syntactic insight of case-theory is that each phonologically real NP, each NP which surfaces has (a) case (feature). This principle, known as the Case Filter, operates at the level of Phonological Form and eliminates lexical DPs devoid of case.

(1)   Case Filter
*DP [- Case] if DP is lexical (applies at PF).

It will be seen that the motivation of the Case Filter is semantic: a caseless DP is uninterpretable. Compare: **It was stolen a car* with *A car was stolen*; in the first sentence, the past participle, *stolen*, cannot assign Acc(usative) case, and the only other case available, the Nominative, goes to the expletive *it*; the Theme DP *a car* is caseless and the sentence is ill-formed. In the correct passive sentence, the Theme DP *a car* will be assigned the Nom(inative) case, by movement in the preverbal position

where Nom is assigned. Alongside of case-assignment, the second range of problems that Case Theory deals with are problems of *case-realization*; this is an investigation of the case-marking devices used across languages. It is known that there is a variety of case-marking devices in the languages of the world.

The prototypical realization of a case feature (prototypical at least with respect to the tradition of Western European grammar) is a case inflection: languages like Latin, Old English, Russian, German, a.o. are strongly inflected. The term m-case (morphologic case) is often used to designate the realization of an abstract case feature, through an inflection (cf. Czepluch (1991)). Prepositions are also used as case markers, exclusively sometimes (e.g. in the case of the French nouns) or alongside of inflections, in languages like English and Romanian. Word order is another means of case-marking. In English, for instance, the Acc DP must be strictly adjacent to the assigning verb (see below). Other less familiar languages systematically use still other means of case realization. Tuscarora, for instance, relies on verbal agreement: information about which NP bears which thematic role is encoded in the morphology of the verb (cf. Baker, 1988: 114-115).

In fact, as stressed by Baker (1988) it is "to capture the equivalence of these systems [that] theorists go beyond the notion of morphological case and introduce the notion of abstract case, which can be manifested in any way at the level of PF." At the same time, it has to be stressed that these means of case marking are *formally non-equivalent and that case realization has far-reaching consequences in the syntax of a language (word order in particular), in its lexical patterns and word-formation processes.*

2. A few basic problems of case-assignment and case-realization in English.

In the typical, core situation, case is assigned by a head to a complement, to a sister DP which subcategorizes the head and is theta-marked by the head; *case will be assigned under government in configurations like (2a, b).*

(2)a. V'
V'[+Acc]   DP
| |
see   him

b. P'
P'   DP
| |
before   the event
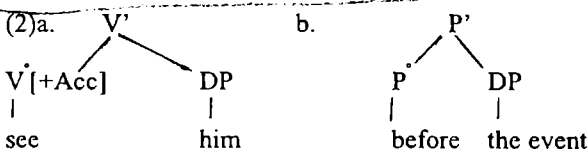
The basic statements of the theory of Abstract Case, as formulated by Chomsky (1981), were the following:

(3)   a. NP is accusative when governed by V.
        b. NP is oblique when governed by P.
        c. NP is nominative when governed by inflection.

A head assigns case to at most one complement, which it also θ-marks. Ignoring the assignment of Nominative by the functional category Inflection, it is

apparent that the two lexical categories which are case-assigners, namely the verb and the preposition, are also direct θ-assigners and that they share the categorial feature [-N].

2.1. As to the mechanism of case assignment, case features may profitably be viewed as projections of the case-assigning categories themselves onto the DPs. The [α Case] feature of the assigner is transferred to the DP by the mechanism of head feature transmission that has already been described. For instance in (2a) the verb *see* projects its [+ Accusative] case feature, as shown below:

(4) $[+V.... + Accusative]_v$ ⁀ NP => V ⁀ NP [+Accusative]

Borer(1984) includes the mechanism of head feature transmission in a more general class of *Inflectional Rules* (morpho-syntactic operations).

(5) Inflectional Rules are those grammatical operations which regulate the transfer of lexical features from heads to arguments. Inflectional Rules apply at any level in a derivation and operate on lexical entries, on features of items.

As a first general statement, one may say that in English, Ns and As, i.e. the [+N] categories, which assign θ-roles indirectly, also assign case indirectly, by means of prepositions. These prepositions act as *case-transmitters*. English, like many other languages, has a rule of dummy preposition insertion, which shows the difference between verbal, and nominal or adjectival behaviour in nearly identical semantic configurations. In English the inserted P is *of*, in French it is *de*, in Romanian it is *de*. Here are examples:

(6) E.   V   N
           a. know the truth   a. knowledge of the truth
           b. declare war   b. declaration of war
                                 A
           c. like cats   a. (be) fond of cats
           d. realize the truth b. (be) aware of the truth
   F.   V   A
           a. aimer Marie   a. être amoureux de Marie
                                 N
           b. aimer la patrie   b. amour de la patrie
   R.   V   N
           a. a citi cărţi   a. citirea de cărţi
                                 A
           b. a iubi muzica   b.iubitor de muzică

Dummy Preposition Insertion applies at S-structure and it is another Inflectional Rule, in as much as it regulates the proper realization of the grammatical feature ⌊α-Case⌋. Dummy Preposition Insertion is a rule which satisfies the requirement of case assignment imposed by the Case Filter. The preposition is inserted in the contexts $[N^° \_ DP]_{NP}$ or $[A^° \_ DP]_{AP}$ by adjunction to the DP, as illustrated in (7a)(For

a slightly different interpretation of the preposition _of_ in this construction, see Chomsky, 1986a).

(7) a.

```
        A'
      /  |
    A°   DP
     |   |  \
     |   P   DP
   fond  of  music
```

b.

```
        A'
      /     \
    A°       PP
     |       |  \
     |       P   DP
 interested  in  art
```

Many Ns and As select particular prepositions that they subcategorize: such prepositions, which are listed in the lexicon, are inserted in the D-Structure, as in (7b) (e.g. _interest in art, passion for music, crazy about tulips_, etc).

This account of case in English correctly shows that Vs and Ps are "better" case-assigners than As and Ns. On the other hand it does not leave much room for the fact that in many languages, adjectives may assign m-cases (e.g. Dative in Romanian: _necesar elevilor_, Dative and Genitive in German: _mir (D) nützlich_ (useful to me). At the same time nouns also license Genitive DPs, a fact which is not addressed in the statements in (3), e.g. _redactarea de scrisorii_, but also _redactarea scrisorilor_. Such data forced the conclusion that further elaboration of Case Theory was needed; this assumed the form of an important difference between cases which are _structural_ and cases which are not structural, but are _inherent_ or _lexical_.
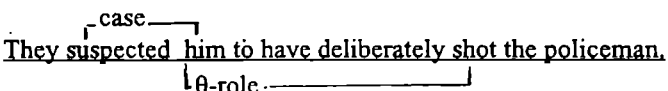
The intuitive core of this difference is to what extent a case is "helpful" in θ-role identification. The obvious relation between θ-grids and cases had prompted Chomsky (1981) to attempt to derive the Case Filter from a condition on semantic interpretation, called the Visibility Condition; the latter says that _only DPs (or chains) that have Case can be assigned θ-roles at LF_; θ-roles are assigned or at least checked at the level of semantic interpretation since they are in the last analysis assigned to chains, and chains emerge on the way from D-Structure to S-Structure). This idea is not without problems; for instance, predicative DPs, or appositions, which are surely not θ-marked, are marked for case (He is an engineer); one might claim that they get case by agreement, under the subject-predicate relation, and claim that the Visibility Cpondition refers to argument DPs. A further difficulty, not so easily dismissed is that PRO is assumed to be caseless (because it is ungoverned0, but PRO is an argument, it is surely assigned a θ-role, and it has to be visible at LF.(For a tentative solution, see Burzio(1994)), In spite of these problems, yet, it is probably correct to distinguish several kinds of cases at this point, each associated with slightly different "Visibility Conditions".

Thus, in rich case-marking languages, some cases are _semantic_ in that a DP appearing in that marphological form will always indicate a particular thematic role associated with the case; a very good example is the Vocative case (e.g. _Ioane, Ioane, dragi ți-s fetele?_), always associated with the pragmatic θ-role "discourse addressee"). Semantic cases allow the retrieval of semantic relations from morphology in the purest way.

Other case- θ-role associations are looser. The case is fit to express a variety of related roles. The assigner of the case "sharpens" the meaning of the DP, specifying the suitable role (in the manner discuessed by Miller(1978));for instance, the Dative in

Romanian expresses "Goal" or rather "orientation to a point", and it is suitably narrowed down in constructions with the case assigner (*util ţării* ('Benefactive'), *superior celui_precedent* ('Goal, reference to point'), etc). In such circumstances, one speaks of *inherent* cases. An important property of inherent cases is the "Uniformity Condition on Semantic Cases", which says that if A assigns inherent case, then some DP may get a θ-role from A only if it gets case from A. For inherent cases, a DP uniformly acquires its case and role from the same head.

Last, but by no means, least, there are *structural cases*: in this situation a head A may assign case to a DP, *whether it is thematically related to the DP or not, as long as the head governs the DP, or is in some other structurally required position*. In other words, it becomes possible for a DP to get case from one head and θ-role from another; in (8) below, him is assigned Acc by *suspect*, and gets its Agent role from *shoot*.

(8)   They suspected him to have deliberately shot the policeman.

Structural cases merely have to meet an appropriate *configurational requirement*, such as, *government by the case assigner*. The term 'structural case' is often opposed to the term 'lexical case' for which Freidin and Sprouse (1992) offer the following definition:

(9) Lexical case designates a Case marking on a DP that is associated with a particular lexical head, and that differs from the canonical configurational Case that would otherwise be assigned to the DP that bears the lexical Case.

The semantic interpretation of a lexical case is often dependent on the semantics of the head. It is easy to see that lexical case obeys the Uniformity Condition, therefore it can be subsumed under inherent case. The concept of lexical case stresses the idiosyncratic nature of case-selection: one cannot predict what cases a verb selects: it is difficult to guess that in Romanian *a crede* selects not only the (predictable) Acc, but also a lexical, quirky, Dat: *Cel_bogat nu-l crede pe cel sarac* (Acc) vs. *Cel bogat nu crede celui sarac* (Dat). Information regarding the selection of cases is again an aspect of subcategorization which cannot be reduced to tθ - structure.

Re-reading the statements in (3) in the light of these distinctions, it appears that Iº and Vs share the fact that they may assign *structural case*, unlike Ns and As, which can only assign inherent or lexical case. Prepositions usually assign inherent case, but there are languages where they are structural case assigners and it will be seen that English is one of them. It appears that, for all their descriptive shortcomings, the statements of the early case theory in (3) operated a significant distinction, sorting out the categories that are potential structural case assigners in UG : I, V, P .

3. Structural cases. The Accusative.

To understand the significance of the proposed distinctions we will examine the Acc, as an example of structural case; secondly, we will contrast the behaviour of

Acc case-assigning verbs and Dat/Gen case-assigning verbs, to illustrate the empirical relevance of the distinction between structural and lexical case.

3.1. A typical *structural case* is expected to have the following properties, all of which are true of the Acc:

a) A structural case is associated with no particular θ-role. In fact the Acc may be anything except an Agent: *He surprised her* (Experiencer), *He found her in the garden* (Theme), *He left the country* (Source), *He hit her* (Patient), etc.

b) A structural case can only be assigned in a particular syntactic position, for example, in the (first-sister) complement position, a position governed by the assigner. Also typical is the Spec position, where case may be assigned by Spec-Head agreement. Structural cases are always assigned in canonical structural configurations.

c) Structural case may be divorced from θ-role assignment, although it need not be; thus in (10a) *see* assigns case and θ- role, in (10b) *prove* assigns only case, and the subject of the infinitive gets its role from the adjective *insane*:

10)   a. He saw the rising moon.
        b. He proved him to be insane. [They proved that he was insane.]

d) Structural case is assigned after Move α has applied, presumably at S-Structure. DPs that are θ-marked but are not in a case position at D-Structure may move to a case position during the derivation and may get case at the level of S-Structure.

e) Since a structural case is associated with a particular structural position, it is predictable. For example, if a verb has only one internal argument, one's first guess is that the argument has Acc marking.

At this point it is perhaps the second property, assignment of the Acc in a configuration of government, that needs discussing. In fact, in addition to government, in certain languages the verb also imposes a condition of *string adjacency* to the case-assigned argument (cf. Stowell, 1981); that is, nothing (or only certain types of constituents) may intervene between the verb and its DO. The strength of the adjacency requirement varies from language to language. In English, adjacency is very strict; even a manner adverbial blocks case assignment.

(11)   a. Mary read the letter slowly.
        b. * read slowly the letter.

In French, there should be *argument adjacency*, i.e. no argument should intervene between the V and the DO, but a manner adverbial or a quantifier may do

(12)   a. Marie a lu lentement la lettre.
        b.* Marie a lu à Paul la lettre.
        c. Marie a lu la lettre à Paul.

In Italian, the V DO sequence may be broken by a manner adverbial (13a), but not by an IO (13b),or by a time, or place, adverbial (14b).

(13)   a. Maria ha letto attentamente un libro.
         b.*Maria ha datto a Paulo dieci dollari.

(14)   a. Maria ha datto dieci dollari a Paulo.
         b.*Maria ha letto ieri/in casa un libro.

Romanian is even more permissive; all the starred sentences of English, French and Italian have grammatical counterparts in Romanian.

(15)   a. Maria a citit rar scrisoarea. (=11b)
         b.Maria i-a citit lui Paul scrisoarea. (=12b)

(16)   a. Maria i-a dat lui Paul zece dolari. (=13b)
         b. Maria a citit ieri/acasă o carte. (=13d)

The condition of strict adjacency for case assignment is an important word order principle for transitive configurations in English. Subcategorization features may be unordered; for a verb like *put*, the subcategorization feature may simply be [− NP,PP] instead of [− NP⌢PP], since word order follows from the principle of adjacency for case-assignment.

3.2. It is not always the case that a unique internal argument gets Acc case marking. A first exception is that of ergative (unaccusative) verbs: a class of verbs that have internal arguments, but cannot assign them Acc case. The object of an unaccusative verb moves to subject position where it acquires Nom marking, thus escaping the Case Filter. But this movement is possible only because the subject position of an ergative verb is non-thematic. We have argued that unaccusatives have no external argument in the discussion of subcategorization in chapter 4 above.

The transitivity scale has three positions rather than two: there are intransitive [unergative], transitive, and ergative verbs. Intransitives(unergatives) and transitives share the property of assigning a θ-role in subject position, as can be seen in (19). Furthermore, there is an important correlation between a verb's ability to assign structural Acc case, and its having or lacking an external argument, that is, a thematic subject. This correlation, expressed in (17) is known as Burzio's Generalization.

(17) Burzio's Generalization
A verb can assign Accusative case only if it assigns a θ-role to its subject.

As their name shows, unaccusative or ergative verbs cannot assign Accusative case because their subject position is not assigned a tθ-role (see (17c)).

(18) Verbs which do not assign a θ-role in subject position are called *non-thematic verbs.*

(19)

a.
```
        VP
       /|
      / |
    NP  V'
          |
          V°
```
$\begin{bmatrix} +\theta \\ +Nom \end{bmatrix}$ V°

J'ai bien dormi.

b.
```
        VP
       /|
      / |
    NP  V'
          |
         / \
       Vo   NP
```
$\begin{bmatrix} +\theta_1 \\ +Nom \end{bmatrix}$ Vo $\begin{bmatrix} +\theta_2 \\ +Acc \end{bmatrix}$

J'ai acheté des cahiers.

c.
```
        VP
       /|
      / |
    NP  V'
          |
         / \
       V°   NP
```
$\begin{bmatrix} -\theta \\ +Nom \end{bmatrix}$ V° $\begin{bmatrix} +\theta \\ -Acc \end{bmatrix}$

Je suis arrivé t.
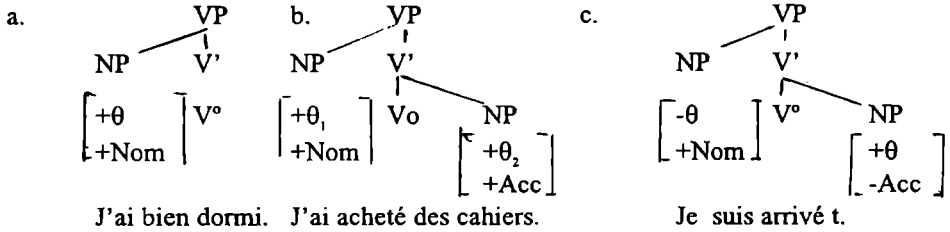
3.2. An internal argument may also acquire *lexical* case, an "irregular" case marking due to the lexical properties of the assigning verb, a case which is unpredictable for the given configuration. Thus Datives or Genitives are "unpredictable" when they are the <u>only</u> arguments (i.e., when the Acc is expected). The same verb may sometimes allow variation between lexical/structural case or the verb may allow only one type of marking. Here are examples from Romanian, German, Russian:

(20)   R   a ajuta pe cineva
(21)   a ajuta cuiva

(22)   German a. Er hat [$_{v'}$ das Mädchen geküßt].
                He has the girl(acc) kissed.
                b. Er hat [$_{v'}$ dem Mädchen geholfen]
                He has the girl(Dat) helped
                c. Er hat [$_{v'}$ des Mädchens (Gen) gedacht.
                He has of the girl(Gen) thought

(23)   Russian a. Ivan poceloval [ètu krasivuju devušku]
                Ivan kissed [that pretty girl$_{Acc}$]
                b. Ivan pomog [ètoj krasivoj devuške]
                Ivan helped [that pretty girl]$_{Dat}$

Generally, it is worthwhile making a distinction between structural and lexical case because the two exhibit markedly different behaviour with respect to a variety of syntactic phenomena. For instance, in German, passive constructions exhibit an asymmetry in the behaviour of configurational and lexical case. A structural Acc in an active construction occurs as Nom in the passive. In contrast, a lexically case-marked object (say a Dative) in an active construction retains the same lexical case marking in the passive sentence and cannot alternate with a Nom.

(24)   a. daß der Polizist [$_{VP}$ [$_{v'}$ den Spion beobachtete]]
                that the policeman (Nom) the spy (Acc) observed

b.daß der Spion [$_{VP}$ beobachtet wurde]
that the spy.(Nom) observed was

(25)   a. daß der Polizist [$_{VP}$[$_{V'}$ dem Spion half]]
that the policeman (Nom) [the spy (Dat) helped]]
b. daß dem Spion (Dat)[$_{VP}$ geholfen wurde]
*daß der Spion (Nom) [$_{VP}$ geholfen wurde]
that the spy (Dat/*Nom) helped was

Freidin (1992: 33) proposes a principle of lexical satisfaction which gives priority to lexical properties over structural properties where the two might appear to conflict.

(26) Principle of Lexical Satisfaction
Lexical properties must be satisfied.

Interesting evidence for this phenomenon is offered, for instance, by Russian, where, (among many other things (see Freidin and Sprouse (1992))), a lexical "stronger" case may suspend an alternation in case-marking which is freely allowed by a structural case. Partitive Gens in Russian provide one striking example of this phenomenon. Consider the data in (27):

(27)   a. Structural case (Acc)
(i) Ja xocu vodu
I want water(Acc)
(ii) ja xocu vody
I want water(Gen)

b. Lexical case
(i) Ivan prišel [$_{PP}$ s vodoj]
Ivan arrived [with water]$_{PP}$(Instrumental)
(ii) *Ivan prišel [$_{PP}$ s vody]
Ivan arrived [with water (Gen)]

In (27a), the Acc case alternates with the Gen, and this alternation correlates with a difference in interpretation: 'the water',in (27ai), versus partitive 'some water', in (27aii). In (27b), an instance of lexical Case assignment, the same Case (the Instrumental) is interpreted as either 'the water', or as a partitive, 'some water'; moreover, as (27bii) proves, the Gen cannot be used in this lexical-case context to express the partitive meaning. Satisfaction of the property [+Instrumental] case takes precedence over semantic facts and the same PP will be given different readings: the case alternation is possible only in the context of a structural case., i.e. the Acc/Gen alternation in (27ai, ii).

3.4. The next point of interest involves the licensing of two m(orphologic)-cases by the same verb. Examples come from German, one of the more familiar well-

studied languages, and also from Romanian. While accepting the principle of Chomsky (1981) that a head assigns case to only one DP, we might relax this to a statement to the effect that a verb has at most one lexical and one structural case to assign (Jaeggli (1986),a.o.). In fact, under circumstances that will be explained, a verb may even license two structural cases. Before discussing this, it has to be specified that the status of an m-case as lexical or structural is always determined on the basis of empirical evidence.

The Dat, for an instance, is an *inherent* case or a lexical case when it is a *single object* of a verb or the object of an adjective or noun. But the Dat may be partly similar to a structural case when it is a second object in double object verbal constructions (when the second object is predictably a Dat because it has to be different from the Acc object). We may also conjecture that one of the two Accusatives of the double object verbs below is lexical and the other is structural.(For a complete description of verbs with two "Direct Objects" in Romanian, see Pană-Dindelegan (1974, 1976).

(28)   a întreba pe cineva ceva./ a ruga pe cineva ceva /a asculta ceva pe cinev./a sfătui pe cineva ceva / a învăţa pe cineva ceva

The two Accusatives behave differently ; only one of them is passivizable: this is the structural case. Just as in the case of German, the lexical case does not become a Nom, that is, it cannot be passivized.

(29)   a.   L-au întrebat pe Ion lecţia.
Ion a fost întrebat lecţia.
*Lecţia a fost întrebată Ion.

    b.   Pe Maria au ascultat-o problemele.
Maria a fost ascultată problemele.
*Problemele au fost ascultate Maria.

Let us return to the problem of how two distinct m-cases, say,one of them lexical, and the other one structural, could be assigned. Because of their dependence on the assigner, lexically specified arguments will "keep close" to the verb, presumably in some verbal complex, V° or V', in a structure like (30a) below, proposed for German and other OV languages(cf.Czepluch (1991 :168 ff), or (30b) for VO languages.

(30)

	a.			b.		
	V'				V'	
DP		V°			V'	DP
	DP		V°	V°	DP	
1.	Acc	Gen			Gen	Acc
2.	Acc	PP			PP	Acc
3.	Dat				Dat	PP
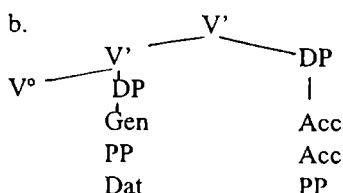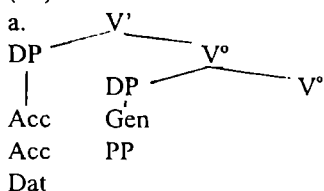
This structure is illustrated by examples like the following German examples:

(31)a.[daß die Frau (Nom)[$_{V'}$ den Nachbarn (Acc)[$_{V'}$ der Lüge (Gen)
bezichtigte]]]
that the woman(Nom) [the neighbour(Acc) [of the lie (Gen) acuused]
b[daß die Frau [$_{V'}$ das Buch [$_{V'}$ auf den Tisch legte]]]
that the woman (Nom) the book(Acc) on the table(PP) laid

Incidentally, The constituency argued for in (30a) can be proved by the fact that it is possible to insert the negation *nicht* preceding the V° complex.The negation *nicht* precedes the simple verb V$_o$, as it does in(31'b) below, the negation of (31'a). Yet in (31'c.d) *nicht* precedes the whole Lexical Case+ Verb structure which acts like a V° constituent

(31') a. daß er den Wein dem Bier vorzieht
that he(Non) the wineAcc) to the beer(Dat) prefers
b.daß er (Nom) den Wein (Acc) dem Bier (Dat) <u>nicht</u> vorzieht
c.daß sie (Nom) den Mann (Acc) <u>nicht</u> [$_{V'}$ der Lüge (Gen) bezichtigte
c. daß sie (Nom) [der Nachbarn (Acc) <u>nicht</u> [$_{V'}$ der Lüge (Gen) bezichtigte]]
d. daß die Frau (Nom) [das Buch (Acc) <u>nicht</u> [$_{V'}$ auf den Tisch legte]]

Structural cases may suspend the head government requirement, i.e. they may be generated outside V', as sisters rather than daughters to V', on condition that V' dominates lexical material, in the sense that there is a realized DO in V'. A second, structural, argument may be licensed in a configuration like (32b), illustrated by the examples in (32c):

(32)
a.   b.
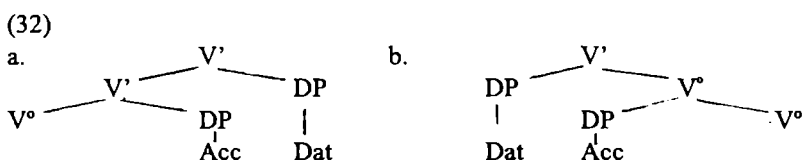
c. daß die Frau dem Jungen das Buch gab
that the woman(Nom) to the boy(Dat) the book(Acc) gave

Czepluch (1991:169) actually formulates a principle that accounts for the licensing of a structural case in structures like (32b): "A lexical category X° may transfer its governance property if and only if it immediately dominates lexical material."

In VO languages with morphological case like Romanian, we expect the mirror image structure of (32b), i.e. (32a) to be possible. In fact, the Romanian Dat shows non-homogeneous behaviour, under comparison between cases when it is a single object and cases when it occurs in double object constructions. The difference may be *partly* correlated with the distinction between lexical and structural case. Actually, it has been

argued, (quite independently from Czepluch, in Comilescu (1987)), that in double object constructions the Romanian Dat is generated and case-marked in the configuration $[[X^\circ \quad DP]_{x'} \_]_{x'}$, as a sister to X' [X = N, V], just in case X° dominates a lexical complement in X'; therefore, the proposed structure is exactly (32a), the V + O counterpart of (32b).In as much as it is related to a particular structural configuration, the Dative resembles a structural case. However the Dative always obeys the Uniformity Condition and it has thematic unity, a fact which aligns it with the inherent cases. The distinction inherent / structural is not an bsolute dichotomy. It is plausible to analyze the Romanian Dat in single object structures as a lexical case and the Dat in double object constructions as a partly structural case in the configuration (32a). The evidence supporting this analysis is both syntactic and semantic. Semantically, the lexical Dat is more diversified. It may be an Experiencer (examples like (33a), but not (33b)), a Benefactive (33b); but its role is rather different in adjectival phrases like (34a), where it simply shows a reference or orientation point (some subspecies of Goal), and also in PPs; there are three prepositions that select the Dat in Romanian (*grație, datorită, mulțumită*, all approximately meaning 'thanks to, owing to'). Note, in particular, that this Dat does not even have to be [+Personal]. The interpretation of the Dat DP in (33-35) clearly shows dependence on the head and this suggests that the Dat is a lexical case in the single object construction.

(33) Verb[+Dat]
a. îmi pare bine, îmi șade bine, ceva îmi place, ceva îmi priește, ceva îmi trebuie
b. a-i zice cuiva Popescu, a aparține cuiva, a-(i) reveni cuiva

(34) Adjective [+Dat]
a. util elevilor, folositor tuturor /progresului țării
b. apropiat mie, superior inamicului, inferior prețului de cost

(35) Preposition [+Dat]
grație efortului propriu, datorită schimbă rilor

The Dative in double object constructions manifests thematic unity; being less dependent on its head for semantic interpretation, it codes the related [+Personal] roles of Goal [Recipient], Benefactive and Benefactive/Possessor:

(36)   a. a-i da cuiva ceva, a-i oferi ceva cuiva, a-i vinde ceva cuiva, etc.
        b. a-(i) cumpăra ceva cuiva, a-i lucra ceva cuiva, a-(i) procura ceva cuiva, a-(i) cere cuiva ceva, etc.
        c. a-i lua mințile cuiva, a-și citi poeziile cuiva, etc.

As to its syntactic behaviour, the Dat in double object structures is often optional, especially when it is a Benefactive (e.g. *Am cumpărat flori (mamei). Am cusut haine (copiilor). Am aranjat (musafirilor) cele două camere. Am cerut bani (stăpânului)*). When it is present, however, as predicted by the theory regarding the

licensing of a second structural case, the structural Dative requires the presence of an Acc. With few exceptions(e.g.*I-am scris mamei*), sentences where the Acc is not present are unacceptable, or if possible at all, they are felt as elliptical and idiomatized (*Am lucrat stăpânului/Am lucrat nişte haine stăpânului. *Am promis copiilor/Am promis dulciuri copiilor. *Am oferit oaspetelui/Am oferit un dineu oaspetelui, etc.*). This distribution suggests that the Dat is assigned in the structure $[[V^o + NP (+Acc)]_{V'}$ $]_{V''}$, i.e. a V^o that dominates lexical material can transfer its governance properties to its first projection V', so that another structural case is licensed (see (32b)).

The difference between a lexical and a structural Dative in Romanian is clearly manifested in nominalizations. The behaviour of the Dat in nominal phrases also strongly supports the contention that the structural Dat is assigned outside X' [where X^o = N, V], on condition that X' dominates lexical material. The first significant fact is that the single object Dat of verbs and adjectives is not inherited in nominalizations. The verbs or adjectives that subcategorize for a Dat either do not have nominalizations at all, or the constituent realized as a Dat in the verbal/adjectival construction appears as a PP (or Gen) in the nominalized form:

(37)a. casa îi aparţine / *apartenenţa casei lui
b. misiunea revine comandantului/ *revenirea misiunii comandantului
c. îmi trebuie bani / *trebuinţa de bani/banilor mie /(?? trebuinţa mea de bani)
d.îmi place filmul / *plăcerea filmului mie
e. ei îmi zic Popescu /*zicerea (lor) Popescu mie (de ei)
(38) el răspunde solicitărilor / răspunsul lui la solicitări
(39) noi suntem superiori inamicului/ superioritatea noastra faţă de inamic
schimbare utilă progresului ţării / utilitatea schimbării pentru progresul ţării

This behaviour of the simple object Dat is to be expected, if the Dat is a lexical case, representing a particular feature of a lexical head. As expected, there are examples of lexical Datives with nouns, but these are simple nouns (denoting relations), which are not related to verbs: *somnul, vame ş vieţii, nepot regelui*, etc; the Dat is a lexical property of these nouns. Unlike lexical Datives, structural Datives can be inherited in nominalizations. Romanian possesses a productive class of attributive constructions in the Dat,in nominalizations, but these are invariably nominalizations of *double object verbs*; moreover, the Dat attribute felicitously occurs in nominalizations only if the NP corresponding to the verb's DO also shows up: the Dat "unilaterally depends on this DO NP" (cf. Avram (1964), Pană (1976)). The former DO is realized as a Gen or as a PP with the case-transmitting preposition *de*.

(40)   a. Ei acordă împuterniciri speciale consiliului naţional.
acordarea de împuterniciri speciale consiliului naţional
b. Ei au oferit minunate daruri tinerilor premiaţi.
oferirea de minunate daruri tinerilor premiaţi

c. Ei au cumpărat un apartament tinerei familii.
cumpărarea unui apartament tinerei familii
d. Ei au intentat un proces fostului ministru.
intentarea unui proces fostului ministru

If the Gen or the PP corresponding to the DO is not lexicalized, the construction is severely ill-formed or uninterpretable: *acordarea comitetului permanent, *intentarea fostului_ministru, *oferirea tinerilor premianți, *cumpărarea tinerei familii. Quite striking for a language where word order is largely free like Romanian is the fact that in these nominalizations word order must be strictly observed; namely, the former DO must precede the former IO: *acordarea comitetului permanent de împuterniciri speciale, *intentarea fostului ministru (a) unui proces.

(41)
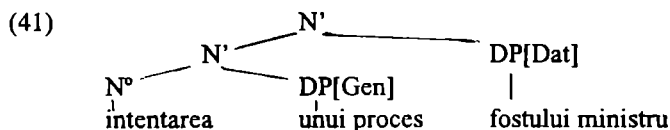
These facts naturally fall into place if the Dat is generated and case-marked as in (41): the Dat is exterior to N', and this explains the word order facts; moreover, within N', N° governs lexical material and· can transmit its government properties to N': consequently, a (structural) Dat may be licensed and case-marked. Thus a structural Dat is possible in Romanian, in a configuration $[_x \_]_{x'}$, where X = V°, N° and X° dominates lexical material in X'; these conditions are similar to those described by Czepluch for German.(His claim is stronger, since he claims that the DO and the verb constitute a complex V°, not V'.)

It has to be added for the sake of completeness that German also allows the flat two-object structure DP_2 [+Acc]...+...DP_1 [Dat]... + ...V°; i.e., there are cases when there are no arguments to claim that the sequence DP_1 [Dat]. + ...V° forms a constituent, e.g. a V° constituent as in (30a) above.

(42) a. daß er den Wein dem Bier vorzieht
that he(Non) the wineAcc) to the beer(Dat) prefers
b.daß er (Nom) den Wein (Acc) dem Bier (Dat) nicht vorzieht
c.daß sie (Nom) den Mann (Acc) nicht [$_v$ der Lüge (Gen) bezichtigte

In particular, when the sentence is negated, the negative nicht precedes only the simple verb V°, as shown in (42b). In contrast, in structures where one DP was a lexical case generated in a V° complex (i.e. $[DP_2... + ...[_v DP_1 ... + ... V°]]_{v'}$, as in (30a) and (42c)), the sentence negation nicht is placed in front of this V° complex, indicating constituency. The two arguments in (42a) are both structural.

In a language with an impoverished morphology like Modern English, we expect few double-argument DP patterns for lack of m-case distinctions. Thus, though in a VO language, V DP$_1$ DP$_2$ is the expected complementation pattern for two DP arguments, in languages with impoverished inflectional systems, the second, DP$_2$, position cannot be licensed distinctively relative to the first DP$_1$, for lack of morphological cases. As a result, the second DP argument must be licensed by a prepositional case-assigner; the "regular" double argument structure will be V⌒DP⌒PP, in such languages. This is indeed the case in English, except for the class of verbs that take a prepositionless Dat IO, followed by an Acc DO, in that order, i.e. V⌒DP$_1$[+Dat]⌒DP$_2$[+Acc] (e.g. <u>They showed him the painting</u>, <u>They bought him the painting</u>); this structure is exceptional in many ways, and none of the many analyses proposed for it has done it full justice (Green (1966), Stowell (1981), Larson (1988), Baker (1988), a.o.).

The cursory comparison of German and English sheds light on an important theoretical point; this is the fact that morphologic cases cannot simply be regarded as "shallow" morphological reflexes of abstract cases, since one does not actually see how to characterize differences between abstract case systems. Rather, whether a language has case morphology or not is an independent property of grammars that has far-reaching consequences for the syntax of the language.

3.5. In the second place, the discussion of some properties of single object and double object constructions across languages confirmed the view that the Acc, assigned under government, is the unmarked possibility of (structural) case realization for the (least prominent) internal argument. The decissive evidence that the Acc is a structural case, however, is that a verb can assign Acc to a DP which it does not θ-mark. The Accusative + Infinitive construction in English and many other languages illustrates this possibility. Typical verbs that govern this construction are: *believe, find, prove; let, make; see, hear; want, expect, etc.* Two specifications are necessary before discussing the Accusative + Infinitive. The first regards the properties of non-finite Inflections, that is, Inflections that lacks Tense and Agreement features, such as, the I° of infinitive clauses, TO, the inflection of gerund clauses -ING. In English non-finite Inflection cannot assign Nom to the subject because it lacks Agr features. This is why the infinitive is often subjecless, as in the following example: *I attempted* [[PRO]$_{DP}$ *TO save more money*]$_{CP}$. A second specification relates to the theory of government, applied with respect to a configuration like (43b):

(43)   a. If some head X° governs a maximal projectio YP, it governs the head Y°, as well as the specifier position of YP. [It does not, however, govern the complement of Y°, ZP; generally, a head does not govern inside the c-command domain of another head.]

(b)

```
            X'
   X⁰ —————————— YP
        SpecY' —————— Y'
              Y⁰ ————————— ZP
```
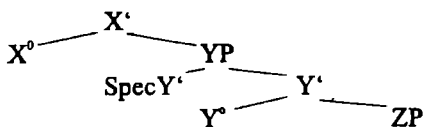
Let us return to the verbs that allow the Acc + Inf construction, listed above. They subcategorize for one clausal argument (Proposition), which is syntactically realized as a CP headed by *that*, or as an infinitive complement, which is an IP, headed by TO: *believe* [+----CP/IP]. It has to be stressed that ability to take an IP infinitival complement is an exceptional lexical property of these verbs; for most verbs, the infinitive constructions behave like CP structures (e.g. I arranged [for him to get the job]$_{CP}$). The finite and the infinitive complements of the same verb are roughly synonymous (at least truth-functionally equivalent). Here are examples:

(44)   a. The doctors still consider [$_{CP}$ that [$_{IP}$ he is insane]]
        b. The doctors still consider [$_{IP}$ him TO be insane]
        c. I believe [$_{CP}$ that [$_{IP}$ tabs$_i$ were kept t$_i$ virtually on all foreigners]]
        d. I believe [$_{IP}$ tabs$_i$ to have been kept t$_i$ virtually on all foreigners]]
        e. I expected [that he would deliberately hurt her feelings]$_{CP}$
        f. I expected [him to deliberately hurt her feelings]$_{IP}$

The subject of the infinitive complement, like the subject of the finite *that*-CP is θ-marked by the verb [or adjective] in the subordinate clause. This is particularly obvious in (44c, d), where the complement clause is passive and the subject is the former DO (t$_i$), a quasi-argument idiomatically selected by the verb *keep* (cf. *keep tabs on*); it is also obvious in (46e, f), where the subject of the complement is interpreted as an Agent with respect to the verb *hurt* and to the adverb *deliberately*. The subject of the finite *that*-complement gets Nom case from the finite Inflection which has Agr features.

Notice, incidentally, that the subject position of the finite complement in (45) · is not governed by the main verb. V° governs the CP constituent, therefore, it governs its head C° and its specifier; but it does not govern inside C'. The subject gets Nom from finite Inflection, by means of a mechanism discussed below. On the other hand, the subject of the infinitive complement in (46) cannot be assigned case inside the subordinate clause, since the non-finite infinitive inflection TO lacks agreement features, and, as stated in (43),(in English) only finite Inflection assigns Nom. The main clause verb is, however, in a configuration where it can assign Acc case. Since V° *believe* in (46) governs its IP complement, it governs both its head, TO, and its specifier, which is precisely the subject position of the subordinate clause. Since it is governed by the main-clause verb, the subject of the infinitive complement can get Acc case from it. Case assignment is clearly separated from θ-role assignment; the subject DP acquires a θ-role from one source (the infinitive verb)· and case from another (the

main verb). Such situations are referred to as "Exceptional Case Marking", and verbs like *believe, prove* etc. are called Exceptional Case Marking (= ECM) verbs. It may be concluded that, in English, a verb may assign Acc to a DP that it governs even if it does not θ-mark it. Consequently, the Acc is a structural case, and verbs are *structural governors*, in English (i.e. they can assign structural case).

(45)

```
        V'
V° ─────────── CP
|        SpecC' ─── C'
|            C° ──── IP
believe      |     DP ──────── I'
            that  (+Nom)   I° ──── VP
                        [+Tns, +Agr]  ╱ ╲
                                     V°   DP
            |-------case--------|
            ↑----θ-marking--------------|
```

(46)

```
        V'
V° ─────────── IP
|        SpecI' ─── I'
|          DP    I° ──── VP
believe         [-Tns, -Agr]  V°  DP
                Acc   TO
|--case---------------↑
        ↑------θ--marking----------|
```
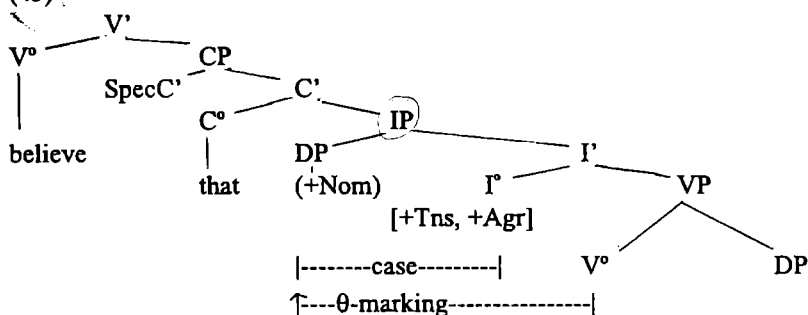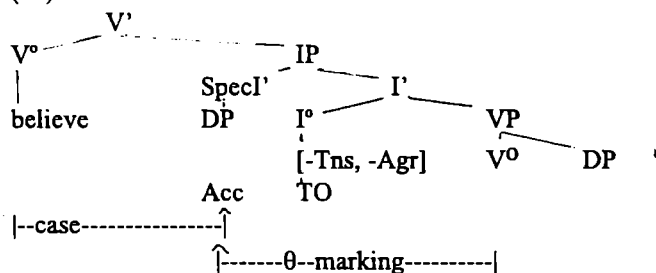
it determines "*canonical government*"(Kayne, 1984, Koster, 1987):

(47)   Canonical government is government in the same direction as the direction in which the V governs its direct object.

Canonical government is rightward if in the grammar of the language V governs DP to its right; it is leftward if V governs DP to its left. Canonical government is to the right in VO languages like English and Romanian and to the left in OV languages like Japanese, German, Dutch.

Having defined canonical government, it is possible to state an interesting condition on *adjunction rules*. As known, according to the landing site, movement rules instantiate either: a) *substitution*, which is a movement to an empty, base-generated position, or b) *adjunction*, movement of some α to a non-argument category β, forming a derived structure [β α [β....]], i.e. (48). It is important that, in (48), α is not dominated by β, since domination is defined as in (49).

(48)

$$\beta\text{......}$$
$$\alpha\text{——}\beta$$
$$\quad\quad\quad t$$
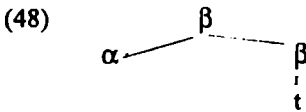
(49) <u>Domination</u>.

β dominates α if and only if all the segments of α dominate β.

Then in (48) only one segment of β is above α, therefore β does not dominate α. The condition that adjunction is movement to a non-argument projection (VP, IP) is derived from the θ-Criterion. If in (48) β were a θ-marked constituent and α is also θ-marked, the higher β-position would host two θ-roles, in violation of the θ-Criterion. NPs moved by adjunction expectedly leave traces behind; it has been shown (cf. Kayne (1983), Bennis (1986:265), a.o.) that in adjunction cases, the antecedent (i.e. the XP that moves) and its trace should be in a *canonical government* configuration; that is, in an OV language, the moved phrase, XP, should precede its trace (in an (XP$_i$, t$_i$) chain), while in a VO language, the moved phrase, XP, should follow its trace (in a (t$_i$ XP$_i$) chain). This means that *adjunction freely operates to the left in an OV language, and to the right in a VO language.* According to this principle, if an object DP, which is to the left of the verb in an OV language, is moved by adjunction, it can only be moved further to the left, i.e. *its relative (left/right) position with respect to the verb is not altered*, since the extraction site and the landing site are on the same side of the verb. This is the intuitive core of the idea of canonical government configuration.

If the 'canonical government configuration' condition defines adjunctions, it follows that reordering rules that do not observe this condition must be instances of *substitution.* The empirical relevance of this condition will appear in an examination of Scrambling in German and Romanian.

3.6. <u>Scrambling</u> (the term is due to Ross (1967)) was the name given to rule which was operative in languages that had relatively free word order (Latin, German, Romanian, etc.) and which re-arranged constituents according to certain *pragmatic* principles. One such principle has to do with the length of the constituents and says that longer, heavy phrases tend to occur towards the right end of the sentence. According to this principle, usually referred to as *end-weight* (cf,Quirk,a.o.(1972)), (50b) is better than (50a):

(50)   a. He threw the letter which he had just decoded into the basket.
        b. He threw into the basket the letter which he had just decoded.

Another very important pragmatic principle referred to the information structure of the sentence: constituents that convey new information (which are *rhematic*) tend to be placed towards the right end of the sentence. Thus, since indefinite elements are carriers of new information, sentence (51b) is better than (51a):

(51) a.I gave a tall boy the pencil.
      b.I gave the pencil to a tall boy.

Scrambling rules are *late* rules; they *operate on S-Structures*. Technically speaking,many (though *not all*) scrambling rules are adjunctions of XP's, i.e. movement of XP's to adjoin to non-argument projections (VP, IP). Scrambling rules obey the requirement of canonical government configuration: they freely operate to the right in VO languages and to the left in OV languages (cf.Bennis, 1986).The Romanian sentence (52a) has the variant (52b), in which the indefinite, rhematic DO has moved over the IO. This variant is produced by scrambling; notice in (52b), as well as in PM (53b), that the antecedent (the moved phrase) follows the trace, and that both positions are on the same side of the verb.

(52) a.   Mama$_k$ a cusut o rochie$_i$ fetiţei$_j$.
      b.   Mama$_k$ a cusut t$_i$ fetiţei$_j$ o rochie$_i$.

(53)
a.
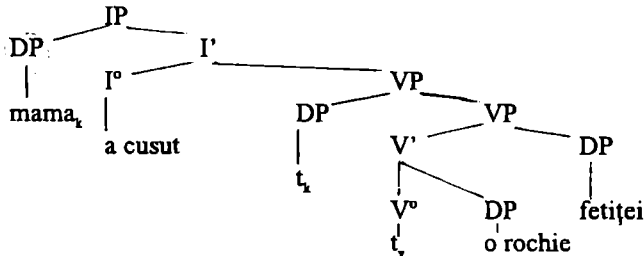
b.
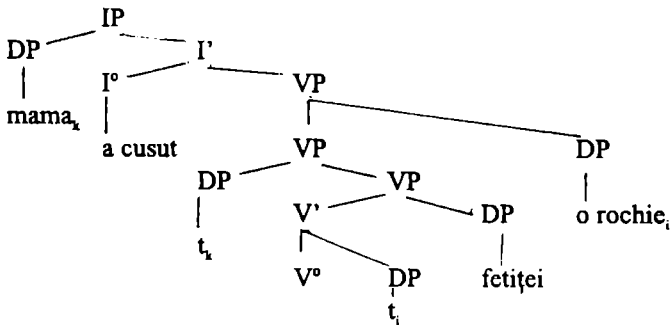
Consider a similar example in German; sentence (54a) represents the structure discussed in (24a) above. The indefinite DO may move past the IO as in (54b) or even past the subject (54c).

(54)   a. dann hat die Frau dem Jungen ein Buch gegeben
          then has the woman (Nom) to the boy (Dat) a book (Acc) given

b. dann hat die Frau$_k$ ein Buch$_i$ dem Jungen$_j$ t$_i$ gegeben
then has the woman a book to the boy given
c. dann hat ein Buch$_i$ die Frau t$_i$ dem Jungen$_j$ t$_i$ gegeben
then has a book the woman to the boy given

Sentence (54a) is a root sentence; the auxiliary verb has raised to C° and there is a topicalized adverb in the Spec C'. Under the VP internal subject hypothesis, (54a) has the representation (55a). The DO may be adjoined to the first VP node, moving over the IO, as in (55b), and then it may adjoin to the next VP node, crossing over the subject as in (55c). Since German is an OV language, free adjunction operates to the left, the moved constituent precedes the trace, and both are to the left of the verb, in a configuration of canonical government.

Interestingly, Koster (1987: 172) has shown that the requirement of canonical government configuration is too strong, particularly for languages where different lexical governors (Vs, Ps, etc.) govern in different directions; yet it can be weakened so as to preserve the basic insight of uniform left/right position in the PM of all the projections linking an antecedent and its trace.

(55)

a.

```
        CP
Spec C'    C'
 |           
AvP  C°      IP
 |    |      I'
dann hat        VP                         I°
            DP       VP                     |
             |   DP       V'                t_v
          die Frau |   DP       V°
              dem Jungen |       |
                     ein Buch  gegeben
```

b.

```
        CP
SpecC'     C'
 |    C°       IP
Av P  |       I'
 |    |           VP                        I°
dann hat  DP       VP                       !
            |   DP       VP                 t_v
          die Frau_k |   DP       V'
              ein Buch_i |   DP       V°
                  den Jungen_j  t_i   gegeben
```

c.

```
        CP
   SpecC'      C'
     |      C°      IP
    AvP      |      I'
     |      VP           I°
   dann  hat
         DP   VP         t_v
            DP   VP
         ein Buch_i  DP    VP
            die Frau_k  |   DP   V'
                       t_i    DP   V°
                    dem Jungen_j  t_i  gegeben
```
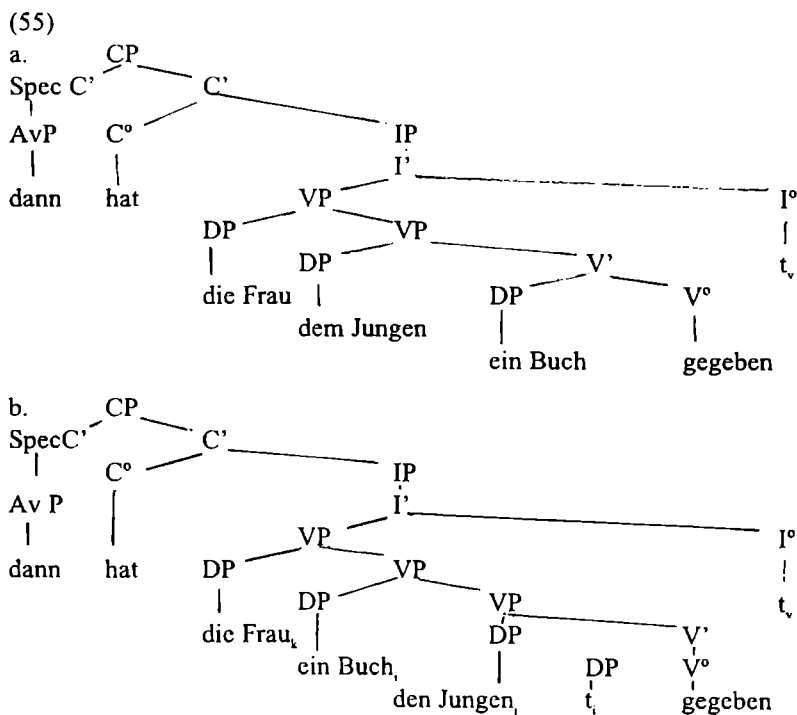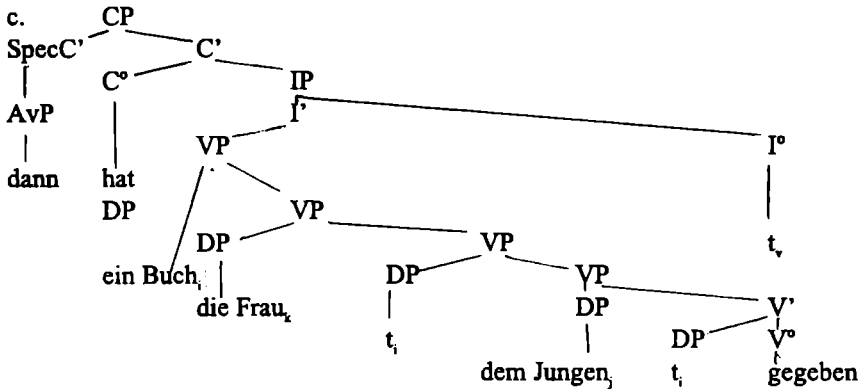
4. Clitics and Case.

We have not mentioned the functional category of *clitics* so far. The presence of clitics in a language defines another parameter of variation. The existence of clitics in a language may affect (among other things) the case realization system of that language, which is why we briefly mention clitics at this point. Romanian is a clitic language.Like most Romance languages, it disposes of pronominal clitics (Dat./ Acc. personal/reflexive forms: El *îmi* vorbeşte, El *îşi* aminteste, El *îl* spală, El *se* spală,), as well as of adverbial clitics: *mai, prea, ne-* (cf. nu a *mai* vorbit, nemaivorbind, n-aş *prea* vrea etc. *a *adesea vorbit*, *aş *rareori* vrea), which enjoy special privileges of occurrence.

Definition - Syntactic clitics are $X°$ elements that do not project a maximal category. Thus clitics are heads ($X°$ constituents) which do not project an independent maximal phrase (XP); consequently they need to be adjoined to a syntactic host (they cliticize on it). Since we are interested in case, only pronominal clitics will be discussed here.

Pronominal clitics and adverbial clitics are assumed to be generated in an *adjunction position to Inflection*, since they themselves may be viewed as inflectional elements expressing morpho-syntactic features of their heads (see (56)). Inflection, or rather the verb that raises to Inflection, is the syntactic host of the pronominal clitic: the clitics "depend" on the Inflection/Verb.

Here are some statements of the theory of clitics(Borer (1984), Kayne (1989, Roberge (1990), Dobrovie-Sorin (1994),and many more).

1. Clitics are base generated in a non-argumental position, adjoined (to some) Inflection (projection) , as in (56):

(56)

```
            I'
      I°            VP
  cl_i    I°     V       DP
   |      |      |       e_i
   îl    Vinfl   t_v
         văd
```
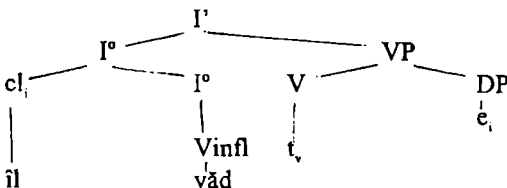
2. The clitic is a *nominal element and this is why it must be associated with a thematic θ-role.* However, since it is an inflexional affix, it cannot be linked to an independent θ-role; in fact, it will be coindexed to a θ-assigned *complement of the verb;* this is the Complement Matching Requirement (cf. Borer (1984)). The clitic adjoined to the inflected verb is in a position where it governs the complement. The clitic and the complement NP (position) make up a (so-called) clitic chain.

3. A pronominal clitic is a spell-out of a verb's case feature. There are situations where the clitic *absorbs the case feature* of the verb. If the verb's case feature has gone to the clitic, the verb can no longer assign case to the complement DP that the clitic is coindexed with. To cope with this situation, languages may employ two different strategies:

a) There are languages where the clitic and the DP complement are in complementary distribution: this is what happens in French. In (57b), [cl$_i$ e$_i$] is a clitic chain, where the clitic supplies the gender, number, case features, and the empty category contributes a thematic role.

(57)   a. Je vois Jean.
          [+Acc]
        b. Je le$_i$ vois [e]$_i$

b) In other languages, an Inflectional Rule of the language provides an independent means of assigning case to the full DP, for instance by inserting a case-marking preposition. This is what happens in Spanish and Romanian:

(58) Spanish		R.	
	.Vimos una casa.		Văd copilul.
	Lo vimos.		Il văd.
	Lo vimos a Juan.		Il văd pe copil.
			*Il văd copilul.

Romanian and Spanish are thus *clitic-doubling languages.* Accusative clitic-doubling environments in Romanian form a subset of the environments where *pe* is allowed, in the sense that doubling entails *pe,* but pe does not entail doubling. *Pe* is not always semantically empty. It usually selects DPs described as [+personal, +individualized]; (for a recent description of its pragmatic value, see Manoliu-Manea (1994)) Compare:

(59)   Văd ceva/pe cineva :   Nu văd nimic/pe nimeni.

From the point of view of Acc-case assignment, the facts of Romanian are as follows: a) There are cases where there is neither *pe,* nor doubling; the verb's Acc feature is assigned to the NP by means of the inflectional rule given above:

(60) $_v$[...+ Accusative]⁀DP => V⁀DP[+Acc]

b)In other instances, the Direct Object DP is marked by *pe* for semantic reasons and there is no doubling. The Acc feature is independently and redundantly assigned to the DP by the verb and by the preposition *pe*.

(61)   V   pe   DP   Văd pe cineva
       +Acc   Nu văd pe nimeni
       +Acc

c)The Direct Object DP is marked by *pe*, and doubled by the clitic. Doubling occurs where the DO is [+human/pronominal] and [+specific/definite](cf.Farkaş,(1978))

(62)
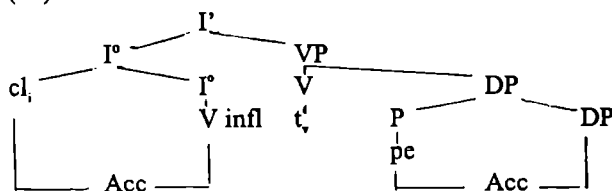
(63)   a. O văd pe o fetiță.
          [+human, -pron, + spec, -def]
       b. O văd pe fetiţa mea.
          [+human, -pron, +spec,+def]
       c. Il vreau pe acesta.
          [-human, +pron, +spec, +def]

Doubling may be viewed as a by-product of the availability of an independently existing case/object marker. When there is doubling, the clitic "absorbs" the verb's case feature and the coindexed DP is case-marked by the preposition *pe*. How does one account for the behaviour of Dative clitics, which are always optional and *co-occur* with the lexical DP Dative?

(64)   Am cumpărat flori Mariei$_i$.
        I$_i$-am cumpărat flori [e$_i$].
        I$_i$-am cumpărat flori Mariei$_i$.

The explanation is not far to seek. The Dative is an oblique, inherent case, covering a range of related thematic roles. Case is not assigned by the verb. The Dative is realized as an underlying inherent m-case; the oblique inflection is a means of coding the dative's semantic role, later narrowed down in combination with the verb, when the Dative discharges an argument in the verb's grid. And this is true about the Dative complement of Vs, As, Ns alike. The verb, unlike the Adjective or Noun, has an optional Dative case feature, which it may spell out as a clitic. The clitic must be coindexed with a thematic position governed by the inflected verb, in order to acquire

its referential index. Dative-clitic doubling may be viewed as a phenomenon of *agreement* between the verb and its complement(cf. Cornilescu (1987)).

The Revised Projection Principle - It is known that the Projection Principle demands that lexical requirements (regarding θ-roles and subcategorization) must be preserved at all levels of syntactic representation (D-Structure, S-Structure, LF). The phenomenon of clitic-doubling shows that what is preserved are the *lexical features of the constituents* - which cannot change or disappear in a derivation. What can change, however, is the manner of realizing these features. A transitive verb must be allowed to occur with the DP it is subcategorized for, and this DP must be assigned case to obey the Case Filter and to be phonologically realized. What may change is the manner in which case is assigned. The rules which regulate the realizations of these features are called Inflectional Rules. *The Projection Principle must be viewed as a condition on the presence at all levels of a category's lexical feature.* This is the so-called Revised Projection Principle.

5. The Nom(inative) case

The Nom Case is a structural case par excellence. It is primarily the case of the subject, and the Su DP always gets its θ-role from one source (the Verb, generally, the predicative constituent) and case from another one (typically from Inflection, but there are other possibilities as well). Since structural cases lack thematic unity, they are identified by the specific configurational requirement that they meet, i.e. by the *position* where they are assigned and the manner of assignment. In the preceding lectures, we have adopted the VP-internal subject hypothesis (see (55)); the Su is thereby defined as an argument external to the maximal projection of the predicate; in (65), it is generated in the Spec position of the VP. This analysis allows one to say both that the Su, like any other argument is θ- marked in one of the projectons of the θ-marking head, (i.e., in one projection of the verb), and that the subject role is assigned compositionally, a property which is thought to be important for defining the external, as opposed to the internal arguments of the verb (cf. Marantz (1984).

(65)

$$
\begin{array}{c}
\text{IP} \\
\text{SpecI'} \qquad \text{I'} \\
\text{DP}_i \qquad \text{I}^o \qquad \text{V}^{Max} \\
\text{[+Tense,+Agr]} \qquad \text{SpecVP} \qquad \text{VP} \\
\text{DP}_i \qquad \text{V}^o \qquad \text{DP}_j
\end{array}
$$
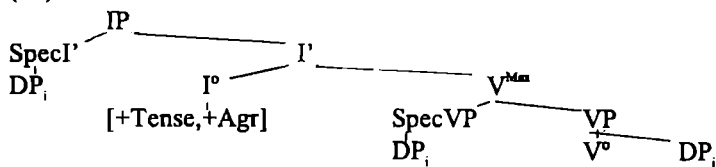
The Spec VP position is therefore an argumental, θ-marked position. Yet, this does not entail that this position is also a Nom case position; in fact, often, this is not a case position.

At least for finite clauses, the positions where the Su is assigned Nom case are defined by the properties of Inflection, and it is also Inflection that determines whether

a Nom position must always be projected and lexically filled during the derivation. There are two subject positions in (65): Spec V' (=Spec VP) and Spec I', and there are languages that assign Nom in Spec V' (e.g. Romanian) and languages which assign Nom in Spec I'.

5.1. *The Split Inflection Hypothesis*. Inflection° is defined as a collection of features, signalling *verbal* and *nominal* properties (tense, person, number, gender), features grouped under the representation I° -> (+ Tense, + Agr) (Modal). The richness of Agreement has already been analyzed as the factor determining the (im)possibility of V-Movement to Inflection;(Pollock's Agreement Parameter). Intuitively, as suggested by Roberts(1991), lexical categories must be somehow "identified" by an appropriate functional category.

In languages where there is rich Agreement (in particular where the [+plural] feature is overtly marked on the verb), the Verb, (as a lexical category) is morphologically identified(cf. Roberts (1991)), and it is obliged to move to Inflection. Technically, Inflection is viewed as an affix subcategorized for a Verb; movement to I° is *obligatory* to satisfy the subcategorial properties of the affix. The inflected verb has *all* the verbal properties, in particular, it can still assign its θ-roles.

(66)

a.

b.

"short movement"
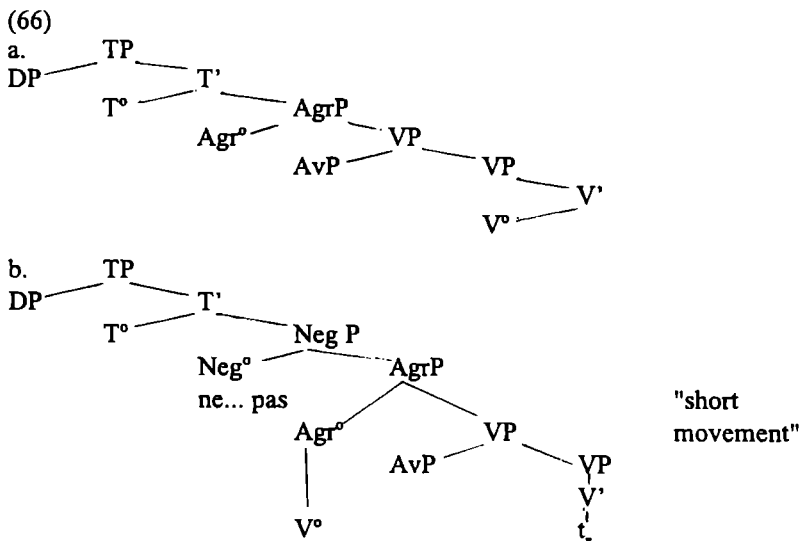
In languages with poor Agreement, the verb is "syntactically identified" (cf. Roberts, 1991) under *government* by some functional head whose complement it is (e.g. an auxiliary, a modal: He *will* do it. He *has* done it, etc.). This is Pollock's Agreement Parameter. Given the syntactic importance of Agr(eement), Pollock(1988) proposes that Agr features constitute an independent syntactic projection. The Inflection node in (65) is split into a Tense Projection (TP), and an Agreement Projection (Agr P) below it (as in 66a). Pollock also proposes that a Negation Projection (NegP) may separate TP from

AgrP in languages like French, English(as in 66b). Pollock replaces (56) by the clause structure in (66a).

In favour of an Agr P below TP, Pollock (1988) adduces distributional evidence (from French and English), involving "short movement", i.e. cases where the V raises to Agr°, but not to T°. French offers clearer data. While in finite clauses all French verbs raise to T°, in infinitive clauses V-Movement is optional: only auxiliary verbs may move to T°, leaving negation behind (cf. (67)), lexical verbs may raise only to Agr, below negation (cf. (68)).

(67)   The V + Neg (surface) order: only Aux verbs.

<u>Aux Verbs</u>:

a.N'être <u>pas</u> heureux est une condition pour écrire des romans.
b.N'avoir <u>pas</u> eu d'enfance heureuse est une condition pour écrire des romans.
c.N'avoir <u>pas</u> de voiture en banlieue rend la vie difficile.
<u>Lexical Verbs</u>:

d.*Ne sembler <u>pas</u> heureux est une condition pour écrire des romans.
e.*Ne regarder <u>pas</u> la télévision consolide l'esprit critique.
f.*Ne pleurer <u>pas</u> en lisant "Les Misérables" dénote de la sécheresse d'âme.

(68) The Neg + V (surface) order ("Short Movement to Agr"): lexical verbs, Aux verbs.

<u>Aux Verbs</u>:
a.Ne <u>pas</u> être heureux est une condition pour écrire des romans.
b.Ne <u>pas</u> avoir eu d'enfance heureuse est une condition pour écrire des romans.
c.Ne <u>pas</u> avoir de voiture en banlieue rend la vie difficile.
<u>Lexical Verbs</u>:

d.Ne <u>pas</u> sembler heureux est une condition pour écrire des romans.
e.Ne pas regarder la télévision consolide l'esprit critique.
f.Ne pas pleurer en lisant "Les Misérables" dénote de la sécheresse d'âme.

In finite clauses, all verbs uniformly raise past negation to the Tense projection.

(69)   a. Je ne suis pas heureux.
        b. Je n'ai pas eu d'enfance heureuse.
        c. Je n'ai pas de voiture.
        d. Je ne semble pas heureuse.
        e. Je ne regarde pas la télévision.
        f. Je ne pleure pas en lisant "Les Misérables".

According to Pollock, structures similar to those in (66a, b) could be invoked for the English data like (70); the infinitive marker TO is generated under T° (examples

(70)), and it may be lowered on the verb (cf. (71)). In examples (70), BE and HAVE may raise past Neg and may reach the Tense projection, adjoining to the marker TO, although examples (70) are less than perfect. Lexical verbs do not have this possibility. In examples (71), the Verb has not moved at all, while *to* was adjoined to the VP, below negation.

(70)   The order V + Neg [? Aux, *MV]

Aux Verbs:
a.?? To be not happy is a prerequisite for writing novels.
b.?? To have not had a happy childhood is a prerequisite for writing novels.

Main Verbs:
c.*To seem not happy is a prerequisite for writing novels.
d.*To get not arrested under such circumstances is a miracle.

(71)   The order Neg + (to) + Verb

All Verbs:

a. Not to be happy is a prerequisite for writing novels.
b. Not to have had a happy childhood is a prerequisite for writing novels.
c. Not to seem happy is a prerequisite for writing novels.
d. Not to get arrested under such circumstances is a miracle.

Although, at least for the English data, alternative (better) explanations are easily available (see Iatridou (1988), Laka (1990), a.o.), the idea that agreement mechanisms take place in independent projections, chiefly by Spec Head Agreement, proved very fruitful; Pollock's analysis has been very influential. It has also shed new light on the relation between morphology and syntax, confirming the view that a large part of inflectional morphology can be considered part of syntax proper. Additional evidence for Pollock's hypothesis comes from the fact that in many languages, Agr° and T° are realized as distinct morphemes. (see the example of the French Future in (73b)).

A difficulty arises at this point: Since Agr (with its pronominal features) assigns Case to the Su by Spec Head Agreement (as will be explained), one would expect the Agr P to be higher, rather than lower, than the TP. Moreover, Baker (1988) has formulated a "Mirror Principle", which essentially claims that inflectional affixes which are higher in the syntactic representation appear *after* lower ones in surface order; he order of the affixes "mirrors the progressive steps of the derivation:

(72)   The Mirror Principle

Morphological Derivations must directly reflect syntactic derivations.
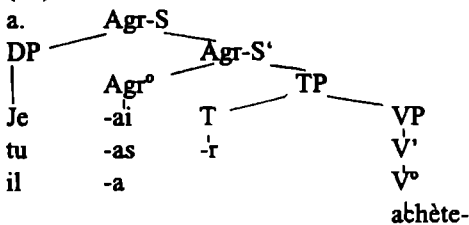
(73)
a.   Agr-S
DP   Agr-S'
| Agrº   TP
Je   -ai   T   VP
tu   -as   -r   V'
il   -a   Vº
                             achète-

b.Future
J'achète+r+ai
tu achète+r+as
il achète+r+a

But notice that, in French, the Future Tense marker -*r* (a preservation of the infinitival form) appears closer to the verb than the person (Agr) markers -*ai*, -*as*, -*a*. This indicates that Agr should be higher than Tense, i.e. the verb first incorporates the Tº morpheme (by movement of V to Tº) and then the person markers (by movement of [Vº + Tº]$_v$ to Agrº) (cf. (73a)).

Adopting structure (73), however, causes problems for Pollock's analysis, since, in his view, the French data indicated the existence of a projection, i.e. of a landing site for V Movement, lower than Tense and Negation (see (66b)). Chomsky (1991) suggests that the solution to this problem is to further subdivide Inflection. His proposal is based on the empirical fact that in many languages (e.g. French, Italian), the verb may show agreement not only with the subject, but also with the object. For instance, in French, there is past participle agreement with the object, if the object has been moved by wh-movement or topicalization.

(74)   a. Il a peint (3rd p., m., sg) beaucoup de tables (f., pl)
          b.Combien de tables(f., pl) a-t-il peintes ? (f., pl)
          c.Il a écrit beaucoup de lettres. (f., pl)
          d.Combien de lettres (f., pl) a-t-il écrites (f., pl)
          e.Ces tables(f., pl.), il les a bien repeintes(f., pl).

To explain such facts, one might postulate the extended clausal structure in(75) below, containing *both an Agr S, and an Agr O projection (*cf. Chomsky (1991)). For sentences like (74), the Aux verbs (*avoir)* is assumed to move to Tº, while the lexical verb moves only to Agrº. It is further hypothesized that the wh-moved object moves *through the position Spec Agr O*P, leaving a trace behind (see (75)). In French, Italian a.o., the presence of a nominal trace in Spec AgrOP triggers agreement of the past participle. The gender-number features of the displaced DP$_i$, which travels through Spec AgrOP, are copied on the past participle (examples (74b, d)). Expectedly, in (74a, c), where there is no movement, there is no past participle agreement. Such facts motivate

the hypothesis of the existence of an Agr OP position, in the extended clause structure (67), now commonly employed in syntactic analysis. Notice in passing that, in French, Agr OP is not a case-marked position, and this is why it cannot be a landing site for movement. In other words, the object may not surface between the Aux verb in $T°$ or in Agr $S°$ and the past participle in Agr $O°$, (cf. (66)),as shown by the ungrammaticality of sentences (76):

(75)

```
        CP
      /    \
  SpecCP    C'
        /        \
      C°          AgrSP
  wh-DP_i    DP /       \
            Agr°         Agr'S
                      /         \
                    Agr°         TP
                              T'
                           /      \
                         T°        AgrOP
                      DP_i /          \
                      |    Agr°      Agr O'
                      t_i      /         \
                            Agr°          VP
                                       /      \
                                     V°        DP_i
                                                t_i
```
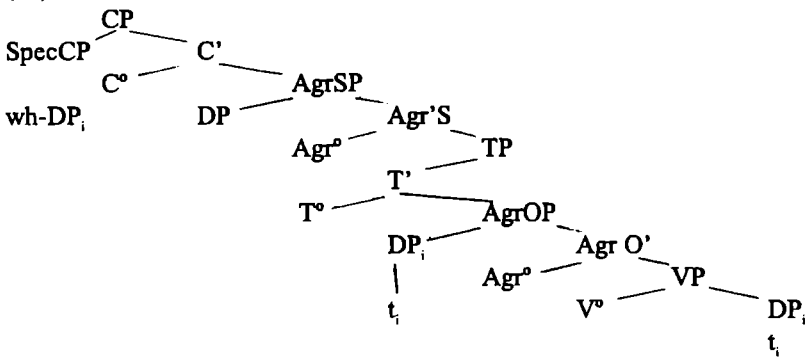
(76)   *Il a [beaucoup de tables]_i peint t_i / peintes t_i
        *Il a [beaucoup de lettres]_i écrit t_i / écrites t_i

A word of caution is necessary here. The Split-Inflection has proved to have great explanatory power for the syntax of various Romance and Germanic languages (see Beletti (1981), Vikner (1991), Deprez (1989) and many others). The Split Inflection Hypothesis starts from the empirical fact that $I°$ represents a collection of varied nominal and verbal features, and chooses to represent bundles of them as independent syntactic projections. It does not follow, however, that all these projections *must* be set up for every language. On the contrary, one is encouraged to set up a functional projection only to the extent that there is *distributional evidence* for the existence of a distinct syntactic position. Thus, in an important analysis of Romanian, Dobrovie-Sorin (1994) claims that Agr SP and Agr OP are not independent positions in Romanian, where there is evidence for just one Inflection position. (For a different opinion, see Isac (1994), Avram (1994)).

5.2. Let us return to the problem of Nominative-assignment, and consider SVO languages like French, English, Italian. In these languages, Nom is assigned in preverbal position, namely in the Spec of the Agr SP. The mechanism at work cannot be government for the following reasons: a)First, $I°$ or in particular the Agr $S°$ position does not c-command the Su position, it merely m-commands it. So to maintain the hypothesis that case is assigned under government, we ought to relax c-command to m-command, an undesirable move. b)Moreover, Agr $S°$ [or $I°$] does not govern the subject in the direction of canonical government, since the Su is to the left of Agr $S°$, and the

canonical direction of government is from left to right in VO languages. c)Thirdly, Agr S°, through its nominal features, is more like a pronoun; it is a [+N] category, more likely to bear case than to assign it.

The mechanism at work in *Nom-assignment is Specifier-Head Agreement*, involving coindexing of Agr-S° with the subject and chain formation. The Su, which is generated in a θ-marked, caseless position (Spec VP) moves to the specifier position of Agr SP, where it gets case by Spec-Head Agreement. An important conclusion in the theory of case is that while inherent/lexical cases are always assigned under government, *structural cases may* (or must) *be assigned by the mechanism of Spec-Head Agreement*. Typically, in SVO languages, preverbal subjects in Spec I, or in the extended representation in Spec Agr-S receive case by Spec-Head Agreement.

In the remainder of this discussion, for simplicity, "unsplit I°" representations are used, whenever the positions visible only by the extended structure are not resorted to. Case transmission inside a thematic chain, as a means of case-assignment, is allowed *only* to positions that cannot get case under government (cf.Dobrovie-Sorin(1994))

Consider now VSO languages like Romanian. Since the language is VO, its underlying structure has to be at least as complex as (77). Consider the following facts: a) The Romanian verb undergoes Verb Raising to Inflection. b) Sentences of type *Citeau copiii poezii, Spălau femeile rufele la râu,* exhibiting VSO order, are grammatical in Romanian.The simplest assumption to make is that Nom is assigned in the post -verbal position, under government by I°, or rather, under government by the inflected verb that has moved to I°. The subject DP in SpecV' is not dominated by the VP, since it is not dominated by all the segments of VP (see (49) above). The I° Position c-commands and governs the subject canonically (from left to right).

(77)

```
        IP
SpecI'  ⌒ ⎯ I'
           I°  ⎯⎯⎯⎯  VP
        [+Tns, +Agr]   /
           -eşte    SpecV'      VP
                      |        /‾‾\
                     DP   V        DP
                      |    |        |
                     Ion  citi    cartea
```
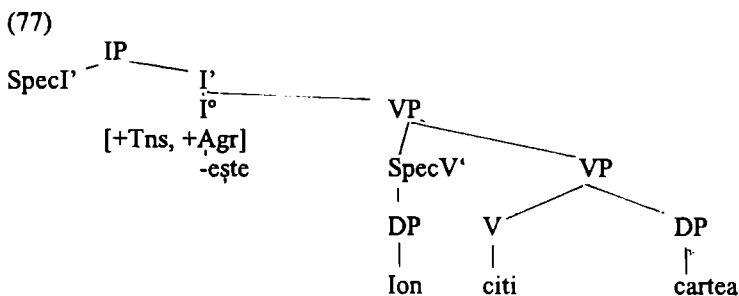
Inflection may thus assign Nominative under (canonical) government. It appears that in this case Agr features are not required for Nom assignment. This may explain why even infinitival clauses, whose I° lacks Agr, may have Nom subjects in Romanian: *Inainte de a ajunge el acolo, nimeni nu ştia adevarul.* The position Spec I' may, but need not be projected: specifier positions are, in principle, optional. In VSO languages, the preverbal SpecI' position may be a topicalization position, open to any topicalized constituent including the subject.

(78)

a.

```
             IP
    SpecI'  ╱      ╲  I'
   ⎧ DP_i ⎫      I°      ╲       VP
   ⎨ AvP  ⎬    V°   I°    SpecVP  ╲  VP
   ⎩ PP   ⎭    │    │     DP    V    ╲  DP
    │        citi + eşte_i  t_i   t_v
   ⎧ Ion    ⎫
   ⎨ Mâine  ⎬
   ⎩ In curând ⎭
```
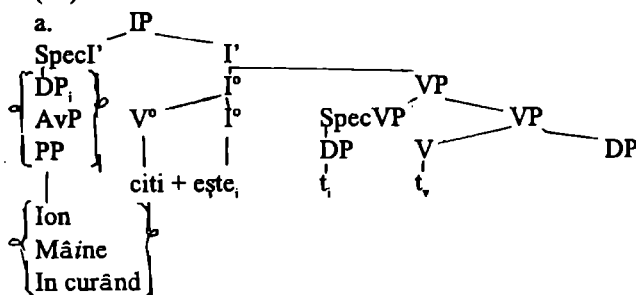
b. Ion citeşte cartea.

c. Miine citeşte cartea.

d. In curând citeşte (Ion) cartea.

There is a third position where a subject frequently appears, namely adjoined to the right of the VP, as in (79). This position is typical of languages that have "free inversion" (Italian, Romanian, etc.).

(79)

a.

```
    SpecI'  ╱  IP  ╲
         I°  ╱    ╲  I'
            VP  ╱     ╲  VP
          V°  ╱    ╲     DP_1
                  DP_2
```
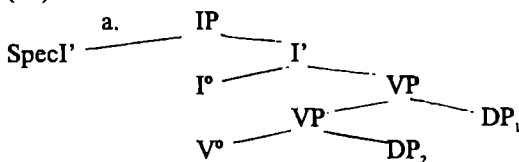
b.   Citeste cartea Ion.

c.   S-a împrietenit cu oaspetele chiar şi Ion.

d. Italian   Ha telefonato Giovanni.

Two analyses are in principle available. The subject may simply be base-generated in its surface position, right-adjoined to the VP, as in (79a). It is still governed by I°, therefore it can be assigned Nom case in this position. Alternatively, we may say that Nom is assigned in canonical subject position, but realized in VP-right-adjoined position, a fact which is again possible since the inverted-subject position is governed by Inflection.

5.3. The case of SOV languages like Dutch, German, Old English, etc. is similar to that of VSO languages (naturally for those clauses that exhibit SOV order); as PM (80) shows, I° canonically governs the subject, DP_1; in such languages, both Inflection and the V govern to the left. The subject is assigned Nom under government.

In conclusion, two basic mechanisms of Nom assignment have been identified. The first is Spec-Head Agreement, involving chain formation and the transmission of Nom from an element which is inherently marked [+Nom] (= Inflection or AgrS°). This mechanism relies on the Agr features that characterize finite inflection. We note in

passing that some form of agreement through coindexing is also likely to be at work when Nom is assigned to a predicative constituent: *Ea este ingineră./ She is an engineer*. The second mechanism is simply one of Nom assignment under government by Inflection (or by the inflected verb).

(80)

```
            C'
   C° ————————
              IP
              I'
       VP ——————————— I°
  DP₁ ———        [+Tense, +Agr]
        —— VP
   DP₂ ————
           —— V°
```
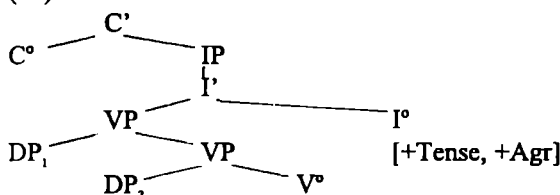
5.4.Non-finite Inflection, i.e. Inflection that lacks tense and agreement features (I° [-Tns, -Agr]), often loses its case-marking properties, chiefly because it lacks agreement. For instance, the infinitive Inflection TO cannot assign case. This is why the infinitive clause often has an empty , PRO, subject.

(81) He$_i$ tried $_{CP}$ [[PRO$_i$] to solve the problem]

When Inflection assigns Case under government, it may retain its case-marking ability even when it lacks Agr; this is the case of Romanian infinitives: *Pentru a ajunge Stefan in tara* .

Another strategy, frequently employed in non-finite clauses, is *case-assignment by an external governor*. Thus, the subject of an English infinitive clause may receive Acc case from a governing verb in the Acc + Inf construction: *They judged [$_{IP}$ her to be too passionate*]; the case of such exceptional case markers as *believe, judge,* etc. was discussed above. Another possible external case assigner for the subject of a non-finite clause is a complementizer, or some other element in C°. English offers the example of the prepositional complementizer FOR, which may asign oblique case to the subject of the infinitive clause, in a structure like (82):

(82)
a.

```
            C'
    C° ————————
              IP
    |    DP ——————
   FOR   |    I' ————
         him$_i$  I° ——    VP ——
              |   DP ——   VP
             TO   t$_i$   go to Vienna
```
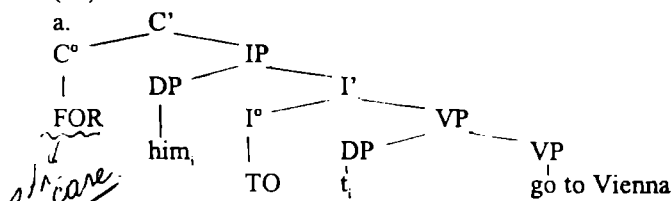
b.I arranged [for [him to go to Vienna]].

FOR in (82a) governs the IP, therefore, it also governs its head (TO) and its specifier, i.e. the subject. The subject naturally gets its θ-role from the infinitive verb. FOR assigns structural case and is a structural governor. Since at least one preposition

in English, namely FOR, may assign case to a DP to which it does not assign θ-role, it may be asserted that prepositions govern structurally in English, like verbs. This is a marked property of English, which has important consequences elsewhere in the grammar.

5.5.Impersonal constructions - We are concerned only with a sub-type of the so-called impersonal constructions (see Pană (1974), Băncilă (1992) for the concept of impersonal construction), namely, *sentences that cannot have a nominative subject: Ii şade bine cu pălăria asta.* (This is quite unrelated to the fact that in some languages a Nom subject is optionally absent because it is "implicitly" understood given the richness of the Agr features of Inflection: *(El) citeşte*). Here are a few examples:

(83) a. Mă doare în gâit.
      b. Mă injunghie într-o parte.
      c. Imi vine bine cu beretă.
      d. Ii prieşte lui Ion la Paris'.
      e. Imi şade bine cu pălărie'.

(84) a' Mă doare gâtul.
      c' Bereta îmi vine bine.
      d' Parisul îmi prieşte.
      e' Pălăria îmi şade bine.

There are not many nominativeless verbs in Romanian, and the few there are tend to develop parallel constructions that accept the Nom, as seen above. What is interesting is that the existence of these verbs poses no theoretical problems in this framework. The verbs in (83) have no external argument; furthermore, no argument is sufficiently prominent on the aspectual dimension to be projected as D-Structure subject; the roles involved appear to be Experiencer (combined with Possessor in (83a, b)) and Location or Theme. As to case-marking, one argument gets case and role from a preposition,the other is a lexical Dative or a lexical Acc (notice that this Acc is not passivizable: *Sunt durută în gât.) Sentence (83d) may be analyzed as in (85). Notice that, since specifier positions are generally optional, it is not required to project the Spec VP position, as well as it was not required to project the Spec I' position.

(85)
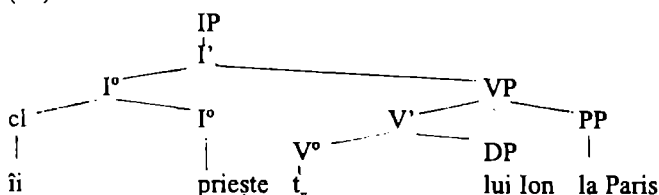
In sentences (84), the prepositional argument is presumably reinterpreted as Cause and projected as D-Structure subject, in a regularized structure.

5.6. Inflection and the Nom Case in English. One may wonder whether it is simply by lexical accident that there are no impersonal nominativeless constructions in English, or whether there is a deeper reason for that. It should be added that impersonal nominativeless constructions were well represented in Old English. Old English is, by and large, a SOV language (cf. Kemenade (1987), Bennis (1986), Weerman (1988) a.o.), but word order is rather loose; in subordinate clauses the most common pattern is SOV (e.g. (86)); yet, quite often an object follows (87).

(86)   a. þæt ic þas boc of Ledenum gereorde to Engliske spræce swende
        that I this book from Latin language to English tongue translated
        b. gif hie him þæs rices upon
        if they him this kingdom granted

(87)   þæt hi sceoldon onenawan heora Scyppend
        that they might acknowledge their Creator

Old English had a rich case morphology and also a variety of nominativeless constructions. From the point of view of Case Theory, the following types of examples, involving verbs with two oblique cases, like *sceamian* (shame), *langian* (long), etc. are the most interesting.

(88)   a. de (Dat) scamode swelces gedwolan (Gen)
        you were ashamed of such an error
        b. hine (Dat) dæs (Gen) langode
        him this longed
        He longed for this.'

One of these cases is a lexical Gen, the second is an inherent Dative, so OE allowed verbs with two internal arguments, both of which were case marked non-structurally.

Bennis (1986) provides a plausible explanation of the differences between OE and ME regarding the obligatory nature of the Nom position in ME. The explanation has to do with the shift from OV to VO and with the loss of case endings. Bennis assumes that OE was indeed basically similar to Dutch or German, having a basic structure like (89):

(89)
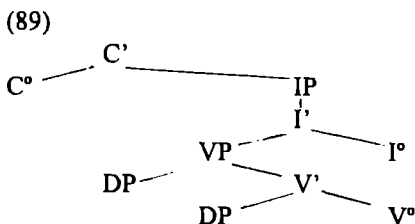
In OE, V and I assign structural case to the left, while P assigns case to the right. Since V assigns case to the left canonical government is from right to left. The external argument can receive Nom within the VP since I° canonically governs it.

Clauses without Nom DPs (impersonal constructions) occur if the verb does not select an external argument, and the internal DP arguments, if present, may receive (inherent) Case in their D-Structure position. Now suppose that in the development of the language a change takes place in the position of I° relative to the VP, so that I° precedes VP rather than follows it. The reason for this might be the generalization of the main clause pattern, which was derived by Verb Second, so that a finite verb in C° preceded the lexical verb. A further change, which can be considered a consequence of the change in the position of I° is the change from OV to VO. This follows if we assume that V and I tend to be adjacent, as a reflection of their complement-head relation. As the VO pattern is established (see Weerman (1988)) for an illuminating account of this change), we assume that the direction of structural Case assignment of V is reversed. This implies that the direction of canonical government changes from right-left to left-right.

A consequence of the change in the position of I and the change in the direction of Case-assignment of V is that the subject within the VP is canonically governed by I', as in (90). However, the direction of Case-assignment of I° *has not changed*, therefore, the subject cannot receive case from I° directly inside VP. In order to be assigned case, the subject argument has to raise to a position to the left of I'. This movement cannot be an *optional adjunction*, since, as suggested above, in a VO language, free adjumction is to the right, while the subjec must move to the left; the antecedent (=the moved subject) and its trace would not be in a canonical government configuration, since the antecedent in SpecI' would *precede* the trace in SpecVP, although the language is VO now, and in the free adjunction cases to the right, the antecedent *follows* the trace, c-commanding it.

(90)
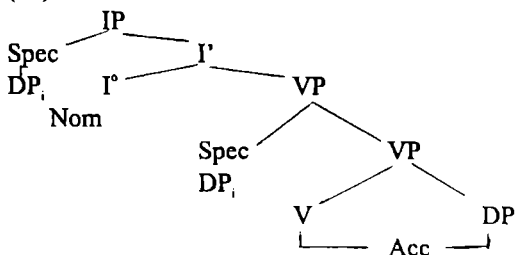
The Nom case position cannot be created by optional adjunction; a DP position in SpecI' defined by the presence of Nom *has to* be projected, in order to move the external argument as an instance of *substitution*. The movement of DP$_i$ from SpecV' to SpecI' to receive case is obligatory and licit since the trace left behind is canonically governed by I°. Therefore, in languages like English and French the *Nom* SpecI position

must be base-generated and has to be appropriately filled or else the derivation is ill-formed. There will be no finite nominativeless sentences. In languages with left adjunction, or where Nom is assigned in SpecV position rather than SpecI' position, it is possible to have impersonal nominative-less sentences.

6. A-Movement.

In the discussion of verb subcategorization, we have distinguished between intransitive verbs, transitive verbs, and unaccusative verbs:

(91) a. NP_1 — [intransitives: sleep, breathe, chirp, ...]
      b. NP_1 — NP_2[transitives: read, surprise ,...]
      c. — NP_2[unaccusatives: be, seem, etc.]

Unaccusative verbs have no external argument, their Su position (SpecVP or Spec I') is initially empty and *non-thematic*. This is why it may serve as a landing site for movement, A-movement in this case, since the mover ends up in an argument position. A-movement is typically caused by the need to acquire case, and thus escape the Case Filter.

6.1. The simplest case of A-movement, already discussed above, is found with unaccusative verbs: their internal object moves to SpecI', where it acquires Case by Spec-Head Agreement: Consider sentence (92a), *This material washes well.*, having representation (92b).

(92)   a.   This material washes well.

b.
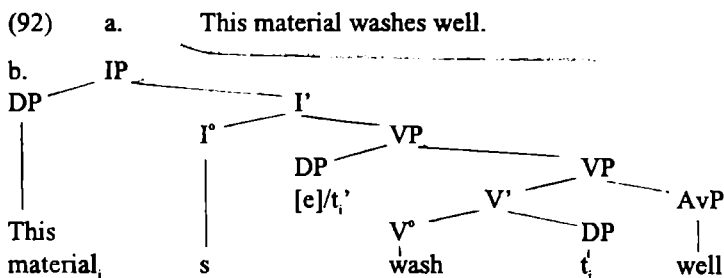
The trace t_i in the A-chain (this material, t_i) is head-governed satifying the ECP.(Alternatively, we may say that it is γ- marked by the intermediate trace, t_i', adjoined to VP, and then deleted at LF.)

A second instance of A- Movement, movement from object to subject position in this case, is represented by the Passive. The underlying structure of the passive semtence 93a is (roughly)93b).

(93)   a. He_i was seen t_i.
       b.   [e] was seen he_i.

Notice now that traces left behind by A-Movenet or NP Movement, as it is also called , occur in at least some positions accessible to reflexives , but not in positions accessible to pronouns, other things being equal:

(94)   a.   He$_i$ saw <u>himself$_i$</u>
           b.   He$_i$ was seen t$_i$
           c.   He$_i$ saw him$_{j \neq i}$

This is one of the reasons why from the point of view of Binding Theory, traces left behind by A - Movement, that is, A-traces or NP traces, are considered to be anaphors, endowed with the features [+anaphoric, - pronominal]. As a consequence, NP traces must always have an appropriate antecedent. They *need to be antecedent-governed,* not only head-governed (cf.Chomsky, 1986b, Rizzi, 1990).

6.2. A well-known class of A-movement involves unaccusative propositional verbs like *seem, appear, happen,* etc. Like *believe* verbs, they take both CP and IP complements, being subcategorized as --- CP/IP verbs:

(95)   It seems that he is honest.
          He$_i$ seems [t$_i$ be honest].

It is easy to prove that *seem, appear* are unaccusative propositional verbs. First, their Su position is non-thematic, it cannot host a contentful NP: Compare *seem* with *sleep*: *John seems every day/ John sleeps every day.* The only nominal that may occupy the Su position of *seem* is the meaningless <u>it</u> (introductory - anticipatory <u>it</u>), in the <u>that</u> complement structure *It seems that he will succeed* ;(but: *It seems*). Notice also that a complement clause is not allowed in the Su position of *seem, appear,* while it is allowed with (other) verbs that take subject clauses:

(96)   [That he said said so]$_{CP}$ surprises me.
          *[That he said so]$_{CP}$ seems.

These facts indicate that the complement clause of *seem, appear* is not a subject, but an object, that is, an internal argument. Next, notice that the *object* position of these verbs is *not case-marked*, it can only be filled by a *clause,* therefore, by a constituent that does not need case.

(97)   It seems that he is tired.
          *It seems this/it.

The object position of these verbs can also be occupied by an appropriate clause substitute; the only acceptable replacer is the adverb *so,* because it does not need case; pronominal clausal substitutes (*it, that*) are excluded, as already explained.

(98)   It seems that he is tired.
          It seems *so*.
          *It seems this/it/that.

We conclude that *seem, appear,* etc. subcategorized for --- CP/IP.
Consider now the underlying configuration in (99b),representing the sentence

John seems to be honest, where the verb *seem* has selected an infinitive complement. The subject of the infinitive clause cannot be assigned case inside the clause, since TO lacks agreement. The infinitive Su is forced to move into the Su [=SpecI'] position of the main verb *seem*, where it can get case by Spec-Head Agreement. The resulting A-chain is well-formed. Its head, the moved DP, is in an argument case-marked position; the trace t_i is head-governed by the main verb *seem;* since the IP is governed by *seem* , the SpecI' position of this IP complement is also governed by *seem*. The subject trace is both head-governed by *seem* and antecedent-governed by the moved subject. The ECP is thus satisfied. The rule which relates structures (99c)-(99d) below is commonly known as Subject to Subject Raising (cf. Postal, 1976), or simply Raising.

(99)   a. John seems to be honest.
       b. [[e seems [$_{IP}$ John TO be honest]]$_{IP}$.

c.

d.
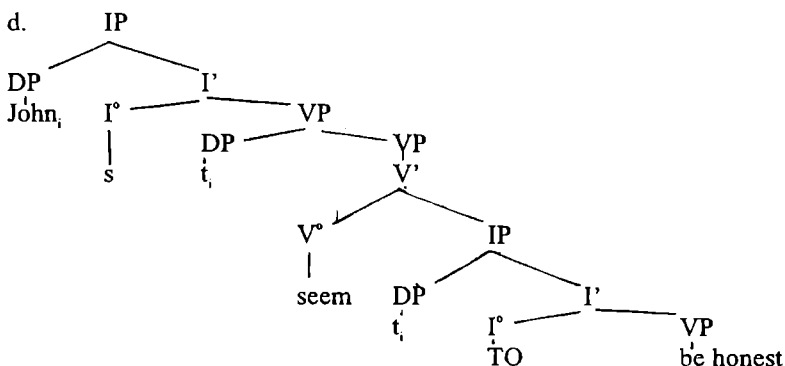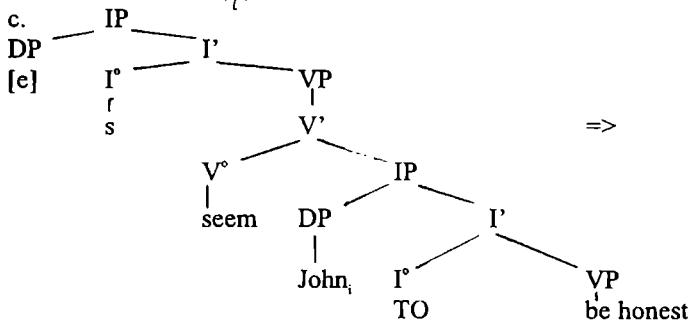
Consider now the examples below:

(100)   a.It seems that it is likely that John will win.
        b.*John$_i$ seems that it is likely [t_i to win]

(101)

```
            IP
   DP            I'
   John;    I°       VP
            s     V'
                V       CP
                I°      IP
                seem  C°    IP
                      that  DP      I'
                            it   I°      VP
                                 |      V'
                                 -s   V°      AP
                                      be    A'
                                          A°      IP
                                          |     DP      I'
                                          |     |    I°    VP
                                       likely  t;   to    win
```
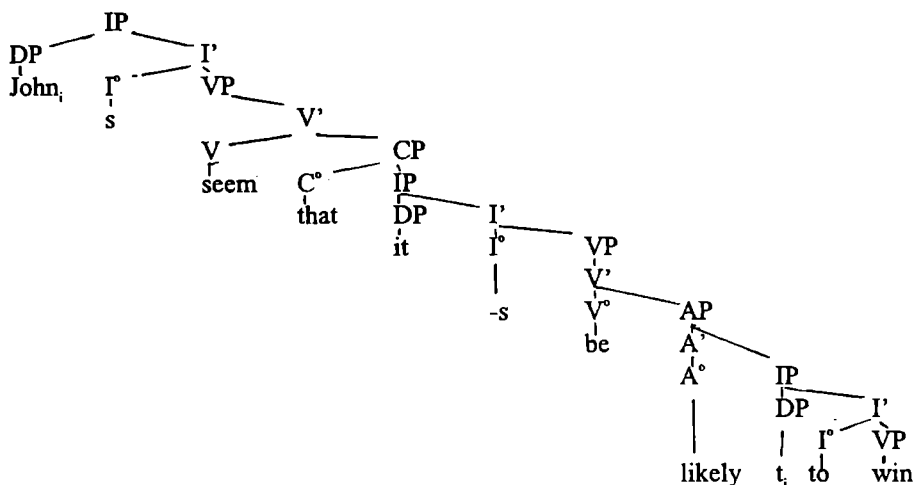
Sentence (100 b) is a case of "super-raising". The infinitive Su has not landed in the first Su (=SpecI') position above the complement clause (=the position occupied by *it*), but it has travelled to the Spec I' position of a higher sentence. Sentence (100 b) is wrong, because it violates the ECP, the trace is head-governed by *likely*, but it is not antecedent-governed; relativized minimality is violated. The intervening Su position, namely, the A-specifier *it*, blocks the antecedent-government relation between *John* and its trace, since it is a closer potential antecedent-governor, (cf (101)).

6.3. As a last example of A-movement, we mention the movement of the subject DP from its basic Spec VP position to the Spec IP position. An A-chain is formed linking the two Su positions. Déprez (1989) speculates that this movement is similar to the Raising case, in as much as Inflection may be viewed as a Raising, non-thematic verb.

7. Characterizing A-positions.

Since Spec I' is not a θ-marked position and since we had initially defined A-positions as positions which may receive a θ-role, we have to revise the characterization of A-positions, or rather of A-chains.

Recently, several properties of A-positions have been shed light on. They also characterize chains headed by A-positions, such as the chain mentioned above, consisting of the trace left in SpecVP and the head (=the moved DP) in SpecI' (or SpecAgrP). These properties of A-chains/positions may be used to test the argument / non-argument nature of a position. Some of these properties have already been mentioned in the preceding chapter.

The first property of A-chains/positions is that they are not sensitive to weak cross-over facts (=WCO). This clearly distinguishes A'-chains (variable chains) from A-chains.

(102)   WCO effects occur in a configuration where a quantifier binds both a variable and a pronoun and neither the pronoun not the variable c-commands the other.

* [Q, [...[pronoun,...]...t_i ...]]

The following sentences where Q is a wh-word or a topicalized constituent, contain A'-chains and exhibit WCO violations:

(103)   a. *Who$_i$ does he$_i$ think Mary loves t_i ?
         b. *John$_i$ he$_i$ thinks Mary loves t_i.
         c. ?? Who$_i$ does his mother love t_i.

The absence of WCO in A-chains is apparent in (104) below, where 'everybody$_i$ ... his$_i$ ...t_i' represent the WCO configuration in (102/104); *everybody* binds both a pronoun and a trace (after Raising) and neither one c-commands the other.

(104)   Everybody$_i$ seems to his$_i$ mother [t_i to be the most intelligent person in the world].

A second property which distinguishes A'-chains from A-chains is the licensing of parasitic gaps: Only A' positions license parasitic gaps.

(105)   a. Which paper$_i$ did you file before reading [e]
         b. These papers, I always file before reading [e].

A-chains do not license parasitic gaps:

(106)   a. The report was filed t_i after Bill read $\underline{e}$.
         b. The report$_i$ seems to have been filed t_i before Bill read [e].

A third property which distinguishes A-chains from A'-chains is that A-chains create new binding possibilities, while A'-chains do not. Consider (107) and (108):

(107) a. *It seems to himself$_i$ that John$_i$ is the most intelligent person in the world.
      b. They $_i$ seem to each other$_i$ to be happy.

Sentences of type (107a) are excluded by principle A of BT, because the anaphor has no antecedent in its governing category. Sentences of type (107b) are perfect, however; raising the NP from the embedded sentence has provided the anaphor with an appropriate antecedent. Now consider the following sentences:

(108)   a. *Pictures of himself always please John$_i$.
         b. *John$_i$ pictures of himself$_i$ killed t_i
         c. *Which boy$_i$ did pictures of himself$_i$ please t_i?

The a) case of (108) is ruled out by principle A of BT, since the anaphor contained in the subject NP has no antecedent. Interestingly, in the b, c. cases the anaphor does have a plausible antecedent, namely, the topicalized NP, or the wh-moved element. These constituents clearly c-command the anaphors: nevertheless, the sentences remain ungrammatical.

Such properties then will be used to differentiate A-chains from A'-chains.

Since in all the examples above it is the Spec I' position which we have tested, we may safely conclude that, although Spec I' is not a θ-marked position, it is an *argument position* (heading an A-chain).

8. Case - assignment or case- checking

In the preceding chapter we have shown that most modules of the grammar actually operate at LF, or earlier. LF is then the representation where most well-formedness conditions of the Grammar are ultimately checked.

Things seem to be different for Case theory; Case is supposed to be assigned during a derivation: lexical/inherent case is assigned at D-Structure, structural case is assigned at S-Structure. Alternatively, we might assume, as in Chomsky (1992) that DPs are taken from the lexicon with a fully specified matrix of features, including case-features. Case will simply have to be "checked" in the appropriate positions.

If some case features cannot be checked, i.e. do not appear in the appropriate positions (which are precisely the previous positions of case assignment), the derivation will crash. The Case Filter may then be viewed as a filtering device operative at LF and checking the case features.

A similar account may be give for other inflectional rules:"Consider for example the past tense form *walked*. The lexicon contains the root *walk* with its idiosyncratic properties of sound, meaning and form specified, and the inflectional feature [tense], one value of which is [past]. One of the computational rules, call it R, associates the two by combining them , either adjoining [walk] to [tense] or conversely. We might interpret this descriptive comment in two ways. One possibility is that [walk] is drawn from the lexicon as such, then R combines it with [past]. A second possibility is that processes internal to the lexicon, (redundancy rules) form the word *walked* with the properties [walk] and [past] already specified. The checking rule R then combines this amalgam with [past], checking and licensing its intrinsic feature [past]. In the latter case, the lexicon is more structured.(Chomsky and Lasnik (1991:5)." .

But if case-checking, and generally, the checking of all inflectional features takes place in specified positions at LF, S-Structure loses syntactic significance, since no well-formedness conditions of the Grammar are fully operative at this level. S-Structure is merely a branch point in the derivation, connected with the Phonological Form.

On the other hand, information supplied by D-Structure is conserved up to LF, through chain formation. The D-Structure representation is also, in some sense,

superfluous. It may be viewed as an *internal interface level* connecting the compututational rules of the grammar with the lexicon.

Of the four representations that we associate a sentence with: PF, D-Structure, S-Structure, LF, only the PF and the LF are conceptually obligatory, in as much as they represent *interface levels*, containing instructions for the performance systems. Only these levels will be obligatory in a 'minimalist' programme. Interestingly, the same two levels have proved to be the most significant theoretically. If Chomsky's ontological hypothesis on the reality of grammars is correct, the fact that the interface levels are the richest informationally may be viewed as peresuasive evidence for the functional design" of languages. Meanwhile, even if we ignore psycholinguistic considerations, the minimalist hypothesis offers a more constrained, and by that much, a more desirable framework of linguistic analysis, since representations are reduced to a minimum.

Further research is needed to ascertain the feasibility of a grammar that operates with only PF and LF.

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INDEX OF BASIC TERMS AND DEFINITIONS

DATA RESTITUIRII