Chapter 1 The goals of linguistic theory

1.0 Introduction
This book is about some of the devices users of human languages employ to put meaningful elements together to form words, words together to form phrases, phrases together to form clauses, clauses together to form sentences, and sentences together to form texts. The emphasis in this book is on the construction of units larger than words, in particular clauses and sentences. This has often been viewed primarily as the domain of syntax. The term “syntax” is from the Ancient Greek syntaxis, a verbal noun which literally means “arrangement” or “setting out together”. (P.1)
The expressions of a language involve a relationship between a sequence of sounds and a meaning, and this relationship is mediated by grammar, a core component of which is syntax. In English and many other languages, the arrangement of words is a vital factor in determining the meaning of an utterance, as illustrated in (1.1; p.1). In Dyirbal (Australia; Dixon 1972) and many other languages, however, the order of words is irrelevant to the determination of the meaning of a sentence; it is, rather, the inflectional form of a phrase which is the crucial factor determining the interpretation of the sentence, as shown in (1.2; p.1).
In this chapter the authors laid out the theoretical background against which current work in syntax, both theoretical and descriptive, is carried out. In section 1.1 they sketch the general goals of linguistic theory which most linguists would agree with, while in section 1.2 they discuss the notion of “explanation” in linguistics. In section 1.3 they outline the two major perspectives on these goals that are most widely held in the field today (p.2).

1.1 Goals of linguistic theory
While it is probably impossible to draw up a list of goals for linguistic theory which every linguist would agree with, it is nevertheless possible to characterize a set of general goals which the majority of linguists would give assent to. They are: description of linguistic phenomena, explanation of linguistic phenomena, and understanding the cognitive basis of language (p.2).

1.1.1 Describing linguistic phenomena
Describing linguistic phenomena is one of the central goals in linguistics, and for many linguists it is their primary goal. Linguistic description is vitally important, for two reasons. First, language is a major part of our common human heritage, and languages are vanishing as their last speakers die or they are supplanted by a socio-culturally dominant language, just as plant and animal species are becoming extinct. Documenting the diversity of human languages is a necessary and crucial aspect of linguistics. Second, developing serious explanatory theories of language is impossible in the absence of descriptions of the object of explanation. Understanding the cognitive basis of language is impossible in the absence
of an adequate cross-linguistic characterization of linguistic behavior. We cannot explain or posit cognitive mechanisms for something unless it has first been described (p.3).

### 1.1.2 Explaining linguistic phenomena

The main impetus to the postulation of explanatory theories of linguistic phenomena came from Chomsky’s early work in generative grammar. He (1957) argued that proper role of linguistic theory is to provide criteria for selecting the most explanatory grammar from among a group of competing grammars. At a more basic level, what is there to be explained? That is, what is it that a linguistic theory should explain? There is in fact a wide range of candidates, and what a theory seeks to explain has profound consequences for the content and organization of the theory. A short, partial list of candidate topics is given in (1.3). (P.3)

(1.3) **Candidates for what a linguistic theory should explain**

- a. how speakers use language in different social situations;
- b. why human languages have the structure that they do;
- c. what is common to all human languages;
- d. why human languages vary structurally the way they do;
- e. how human languages change over time;
- f. how speakers produce and understand language in real time;
- g. the nature of native speakers’ knowledge of their language;
- h. how children learn language.

There are many more questions one could come up with, but this list is sufficient for this discussion. Virtually all theories are interested in questions (b)—(d), and the issue is usually phrased, “how are human languages different and how are they alike?” An important component of the answer a theory gives to the question of what is to be explained derives from the conception the theory has what language is in the first place (p.4).

### 1.1.3 Understanding the cognitive basis of language

The last three topics listed in (1.3) refer to explicitly psychological questions about language, and many linguists, following Chomsky, maintain that cognitive issues are in fact the most important issues to be explained; they do not necessarily agree, however, on which questions are the most important and how they should be approached. The three questions in (1.4) highlight three major facets of the psychology of language: (P.4)

(1.4) **Processing**: What cognitive processes are involved when human beings produce and understand language on line in real time? How specialized to language are these processes?

**Knowledge**: What constitutes knowledge of language? How is it organized? How is it represented? How is it employed in language processing? How does knowledge of language relate to knowledge in other cognitive domains?

**Acquisition**: How do human beings come to have knowledge of language? What is the nature of the acquisition process? Is coming to know language similar to or different from acquiring knowledge in other cognitive domains? Does it involve knowledge from other cognitive domains?

These questions have become fundamental ones in the cognitive sciences and are the driving force behind much of the research and theorizing in linguistics today (p.4).
1.2 Explanation in linguistics
Since explanation is an important goal in linguistic theory, it is necessary to clarify exactly what the explanatory criteria used by linguists are and what standards linguists set for their theories to meet. (P.4)

1.2.1 Types of explanatory criteria
There are two basic types of criteria, empirical and theory-internal criteria. Empirical criterion is including inductive and deductive theories. Inductive theories derive generalizations from the observation of many exemplars of the phenomena under investigation; the hypotheses so generated are descriptive in nature. The generalizations of structural linguistics are inductive in nature. The relationship between data and theory with inductive theories is data—hypothesis. Deductive theories are explanatory theories, and the relationship between data and theory is hypothesis—data. Theory-internal explanatory criteria are given in (1.5). (P.5)

(1.5) Theory-internal explanatory criteria
a. Economy (Occam’s Razor): Is it the simplest theory?
b. Motivation: Are the crucial explanatory constructs independently motivated or are they ad hoc.
c. Predictiveness: Do the hypotheses predict phenomena beyond those for which they were formulated?

While it is no always to come up with explicit criteria for simplicity in a particular theoretical domain, the simplest theory is to be preferred. Motivation refers to the extent to which the hypotheses follow in a natural way from the preexisting theory and the extent to which the constructs invoked in the explanation are also required elsewhere in the theory. With respect to the third criterion, hypotheses which make empirically testable predictions about other observed phenomena or phenomena not yet observed are more highly valued than which do not. (P.5-6)

The theory-internal criteria in (1.5) play a central role in theoretical argumentation in linguistics. An external explanation would be an account of some syntactic pattern which makes crucial reference to semantics (i.e. the meaning of the pattern) and/or pragmatics (i.e. the context in which it occurs or the communicative function which it serves). A semantic explanation for a syntactic pattern would be an external explanation, on the standard assumption that syntax and semantics are distinct from each other. These different explanatory criteria may be summarized as table 1.1. (P.7)

<table>
<thead>
<tr>
<th>Domain to be explained</th>
<th>Theory-internal criteria</th>
<th>External criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNTAX</td>
<td>Economy</td>
<td>Phonology</td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
<td>Semantics</td>
</tr>
<tr>
<td></td>
<td>Predictiveness</td>
<td>Pragmatics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perception</td>
</tr>
<tr>
<td></td>
<td></td>
<td>…</td>
</tr>
</tbody>
</table>

1.2.2 Levels of adequacy in linguistic theory
Chomsky proposed three levels of adequacy that grammar must meet in his 1965 book, Aspects of the theory of syntax. They are: (1) observational adequacy, i.e. the grammar correctly predicts which sentences in a language are well formed (grammatical) and which are not; (2) descriptive adequacy, i.e. the grammar is observationally adequate and it assigns structural descriptions to the sentences in the language that capture native speaker intuitions about the structure and meaning of the sentences; and (3)
explanatory adequacy, i.e. the grammar is descriptively adequate and is part of a theory which provides an account of ‘how these facts arise in the mind of the speaker-hearer’. Observational adequacy is the criterion of empirical accuracy applied to the sentences of a language, whereas descriptive adequacy is also based on empirical accuracy, in this case applied to native speaker intuitions about sentences. It is at the level of explanatory adequacy that the theory-internal criteria in (1.5) come into play, and it is a point of disagreement among theories as to whether external criteria are relevant here or not. (P.7-8)

Dik (1978, 1991) proposed additional types of adequacy, first, **psychological adequacy**, which states that a theory should be “compatible with the results of psycholinguistic research on the acquisition, processing, production, interpretation and memorization of linguistic expressions;” second, **pragmatic adequacy**, i.e. the theory and the language descriptions based on it should be interpretable within a wider pragmatic theory of verbal communication; third, typological adequacy, i.e. the theory ‘should formulate such rules and principles as can be applied to any type of language without “forcing”, i.e. without adapting the language described to the theory already developed.’ (P.8)

**1.3 Contrasting perspectives on the goals of linguistic theory**

The authors sketch out two very general perspectives on these goals, each of which subsumes a variety of syntactic theories and approaches. (P.8)

**1.3.1 The syntactocentric perspective**

Chomsky (1965) laid out that syntax is the central aspect of language. The phonological and semantic aspects of language are derivative of and secondary to syntactic structure, and he proposed a fundamental distinction between linguistic competence and linguistic performance. He (1986a) has further distinguished between “E[xternal]-language” and “I[nternal]-language”. E-language corresponds roughly to the pretheoretical idea of what a language is and I-language is a speaker’s internal grammar. E-language consists of the overt phenomena of linguistic interaction in the socio-cultural realm, while I-language (the grammar) is an abstract object accessible only through native speaker intuitions, and in this view only I-language falls within the scope of linguistic inquiry. Universals for Chomsky are generalizations about I-language (properties of grammars e.g. “all grammars make use of the syntactic categories NOUN and VERB”); he refers to them as “linguistic universals”; they are not about E-languages (properties of languages, e.g. “virtually all verb-initial languages have prepositions rather than postpositions”). Chomsky (1995) has claimed that syntactic system in all languages is the same and that all differences among languages are attributable to differences in the properties of lexical items in different languages. This is the first perspective (the syntactocentric perspective). (P.9-10)

**1.3.2 The communication-and-cognition perspective**

The second perspective called “the communication-cognition perspective, from this point of view, human language’s role as a means of communication, its role in broader cognitive processes such as reasoning and conceptualization, and its relations with other cognitive systems such as perception and knowledge are all relevant to and indeed crucial to the study of language structure. The majority of linguists are interested in how syntax interacts with semantics and pragmatics. Theories which reject the syntactocentric view and adopt this general perspective include Functional Grammar (FG; Dik 1978, 1991), Role and Reference Grammar (RRG; Van Valin 1993b), Systemic Functional Grammar (SFG; Holliday 1985, 1994, Matthiessen 1995), Tagmemics (Pike 1982), Lexical-Functional Grammar (LFG; Bresnan 1982a), Head-Driven Phrase Structure Grammar (HPSG; Pollard and Sag 1994), Construction Grammar (ConG; Fillmore 1988, Fillmore, Kay and O’Connor 1988), Autolexical Syntax (Sadock 1991), Word Grammar (WG; Hudson 1984), the St. Petersburg school of functional grammar (Bondarko 1991), Meaning-text theory (Mel’chuk 1979, 1987, Mel’chuk and Pertsov 1986), Cognitive Grammar (CogG, Langacker 1987, 1990; Lakoff 1987), Prague School Dependency Grammar (Sgall, Hajicova and Panevova 1986), and French functionalism (Martinet 1962, 1975). In addition, there are a number of individuals whose work has been very important in the development of this perspective but who are not
associated with any of the above theories, in particular Michael Silverstein, Ray Jackendoff, Allen Prince, T. Givón, Susumu Kuno, Leonard Talmy, Sandra Thompson and Anna Wierzbicka. These approaches represent a great range of theoretical opinion, what they have in common is first, a rejection of the syntactocentric view of Chomsky, and second, an acknowledgment of the importance of communicative factors, cognitive factors or both in grammatical theory and analysis. One of the striking things that these various approaches have in common is the acceptance of external criteria in explanation (see table 1.1), and this distinguishes them from Chomskyan view. Language-external criteria are also accepted by most of these theories. All of theories mentioned above would agree on explanation as the highest goal, and with description as a secondary but important goal. (P.11-12)

1.4 Concluding remarks
The authors have explored the goals of linguistic theory from two rather different perspectives in this chapter. In this book they proposed a framework for the analysis of syntax from communication-and-cognition perspective. Their goal is two-fold: first, to present an explanatory theory of syntax which can address the major issues in contemporary syntactic theory; and second, to present a descriptive framework which can be used by field linguists for writing grammars. The general skeleton of the framework derived largely from Role and Reference Grammar (RRG), but the content of the proposals was drawn from the various theories and individuals’ work that fall within this perspective. (P.15-16)

Chapter 2 Syntactic structure, I: simple clause and noun phrases

2.0 Introduction
In this chapter the authors investigate the structure of phrases and clauses in simple sentences. There are two fundamental aspects of structure which every theory must deal with: relational and non-relational structure. Relational structure deals with the relations that exist between one syntactic element and another, be they syntactic, semantic or pragmatic in nature, whereas non-relational structure expresses the hierarchical organization of phrases, clauses and sentences. They concentrate on the non-relational structure in simple phrases and sentences in this chapter. (P.17)

2.1 General theoretical issues
2.1.1 levels of syntactic representation
There are a number of phenomena which have been represented as justifying the postulation of multiple levels of syntactic representation. Since the motivation for multiple levels of syntactic representation is entirely theory-internal, there is no empirical fact in any human language that can disprove their existence. Arguments against them would generally have to be one of two kinds: (1) a demonstration that a certain phenomenon which has been asserted to require recourse to multiple levels, can be handled equally well or better by a different analysis which posits only a single level of syntactic representation; or (2) a demonstration that multilevel syntactic analyses are unnecessarily complex and inelegant or entail a loss of significant generalizations. (P.11-21)

The general structure of RRG-based theory of grammar they are presenting is as in figure 2.2:
This picture is elaborated as the authors proceed, but it makes clear that we are positing only a single level of syntactic representation for a sentence, which is mapped directly into the semantic representation of the sentence (and vice versa, hence the double-headed arrow). (P.21)

2.1.2 Universal aspects of structure

The authors are presenting a single-level theory of syntactic structure that is part of a theory of universal grammar, it is imperative that they base it on notions that are universals. They impose an additional strong requirement on a universal theory of clause structure: comparable structures in different languages should be given comparable treatments by the theory. These two requirements are summarized in (2.5). (P.22)

(2.5) General considerations for a theory of clause structure

a. A theory of clause structure should capture all of the universal features without imposing features on languages in which there is no evidence for them.

b. A theory should represent comparable structure in different languages in comparable ways.

There is an important problem, even though there is no simple or easy solution to it. This is the problem of identifying correspondences, in particular corresponding structures, across languages. This is a problem which all theory concerned with cross-linguistic comparison face. (P.22)

2.2 The layered structure of the clause in simple sentences

2.2.1 Universal distinctions in clause structure

The optimal representation of clause structure is one which reflects universal distinctions that every language makes. Two which play a role in the syntax of every language are the contrasts between predicating elements and non-predicating elements, on the other hand, and between those NPs and adpositional phrases (prepositional or postpositional phrases) which are arguments of the predicate and those are not. These contrasts are represented graphically in figure 2.5:

| Predicate + Arguments | Non-arguments |

Figure 2.5 Universal oppositions underlying clause structure

A predicate refers only to the predicating element, which is a verb, an adjective or a nominal of some sort. The predicate defines a syntactic unit in the structure of the clause, the nucleus. In a clause containing a number of NPs (and PPs), some of them are semantic arguments of the predicate and some are not. It is, therefore, fundamentally important to distinguish those elements which are arguments of the predicate from those which are not. The authors express this by positing a distinction between the core of the clause (the predicate + its arguments) and the periphery (those elements which are not arguments of the predicate). These distinction, together with the notion of the nucleus, constitute what they call the layered structure of the clause (LSC), as in figure 2.6. (P.26)
Figure 2.6 Components of the layered structure of the clause

The core is defined as the nucleus plus the arguments of the predicate, and core arguments are those which are part of the semantic representation of the verb. Arguments of the verb occur in a special outside of the core called the “precore slot”. Non-arguments are often referred to as adjuncts. The distinction between nucleus and core and between core and periphery are universal, as there is much cross-linguistic evidence for them both clause-internal and complex sentence syntax. The relationship between the semantic and syntactic units are summarized in table 2.1. (P.27)

Table 2.1 Semantic units underlying the syntactic units of the layered structure of the clause

<table>
<thead>
<tr>
<th>Semantic element(s)</th>
<th>Syntactic unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicate</td>
<td>Nucleus</td>
</tr>
<tr>
<td>Argument in semantic representation of predicate</td>
<td>Core argument</td>
</tr>
<tr>
<td>Non-arguments</td>
<td>Periphery</td>
</tr>
<tr>
<td>Predicate + arguments</td>
<td>Core</td>
</tr>
<tr>
<td>Predicate + arguments + non-arguments</td>
<td>Clause (= core + periphery)</td>
</tr>
</tbody>
</table>

This scheme is universal because every language makes a distinction between predicates and arguments, and every language distinguishes between NPs/PPs which are arguments of the predicate and those which are adjuncts. The distinctions among nucleus, core and periphery are fundamental to the clause structure of all human languages. It is important to recognize that the nucleus, core, periphery and clause are syntactic units which are motivated by these semantic contrasts. The nucleus is the syntactic unit housing the predicate, but it is not identical with the predicate; this will be seen most clearly when we look at noun incorporation, in which there is both a verb and noun stem in the nucleus (see section 2.3.2). Similarly, the core is the unit containing the nucleus and the arguments in the semantic representation of the predicate in the nucleus, but there are instances in which the core contains a syntactic argument which is not a semantic argument of the predicate in its nucleus. Hence, the notion of “core” is motivated semantically, but it is not possible to determine it purely semantically. The periphery is a syntactic unit encompassing NPs/PPs which are either secondary participants or modifiers of the core. The clause is a
syntactic unit composed of the core and periphery. The sentence is an even larger syntactic unit, which may contain multiple clauses in complex sentence. (P.27-29)

It is necessary to distinguish between direct core arguments and oblique core arguments. Direct core arguments are core arguments which are either unmarked, or marked by case alone, and oblique core arguments are those which are adpositionally marked (see 2.9 a, b). (P.29)

A very important feature of the layered structure of the clause is that the distinctions among the layers are not dependent in any way on the linear order of elements in a clause (see, 2.11, Dyirbal language). The elements of the core, nucleus, and periphery can in principle appear in any order in a clause, and because the definitions of each unit are independent of linear order or adjacency considerations, this variation is unproblematic. (P.30-31)

2.2.2 Formal representation of the layered structure of the clause

2.2.2.1 Representing the universal aspects of the layered structure of the clause
To represent the nucleus, core, periphery and clause, the authors use a type of tree diagram which differs substantially from the constituent-structure tree discussed earlier. The abstract schema of the layered structure of the clause can be represented as in figure 2.7. The clause consists of the core with its arguments, then the nucleus, which subsumes the predicate. At the very bottom are the actual syntactic categories which realize these units. Notice that there is no VP in the tree, for it is not a concept that plays a direct role in this conception of clause structure. The periphery is represented on the margin, and the arrow there indicates that it is an adjunct; that is, it is an optional modifier of the core. (P.31)

![Figure 2.7](image-url)  
**Figure 2.7** Formal representation of the layered structure of the clause

2.2.2.2 Non-universal aspects of the layered structure of the clause
Question words in language like English appear in a clause-initial position which is distinct from the core initial position that the subject occupies in English. It is also possible for a non-WH NP or PP to occur in this same position in sentences. Neither this NP or PP nor a WH-word is separated from the rest of the sentence by a pause or intonation break. The position which these elements occupy is called **precore slot**, and it is inside of the clause but outside of the core. In addition to a WH-word or NP/PP in the precore slot, it is also possible to have an initial phrase set off from the rest of the sentence by a pause or intonation break (see i.e. 2.14; p.36). The position of the initial phrase is distinct from the precore slot. This position, which will be termed **the left-detached position**, is outside of the clause but within the sentence (Figure 2.12, p.36). There are languages which have a postcore slot as well, such as Japanese (see i.e. 2.15, p.37).

Detached phrases may in fact appear either before or after the clause, therefore, it is necessary to distinguish the two types of detached phrases, a **left-detached position** and **right-detached position**.
Hence position is relevant to the special position of WH-word, certain postposed elements and detached phrases, but it is not relevant to the more basic issue of determining core vs. peripheral elements. The abstract representation of the clause containing the pre- and postcore slots and the detached positions is given in figure 2.14 (P.38); the periphery is omitted for simplicity of representation. (P.37)

There is an interesting difference between the universal and non-universal aspects of clause structure. The universal aspects (the nucleus, core, periphery and clause) are all semantically motivated, as shown in table 2.1. The non-universal aspects (the detached phrases, the extra-core slots) are not semantically motivated; rather, they seem to be pragmatically motivated (or at least are associated with constructions that have strong pragmatic conditions on their occurrence). The more semantically motivated a phenomenon is, the less cross-linguistic variation we find, whereas the more pragmatically motivated a phenomenon is, the more cross-linguistic variation is evident. (P. 39-40)

![Figure 2.14 Abstract LSC including extra-core slots and detached positions](image)

### 2.2.3 Operators and their representation

Elements are not attached to anything, and yet they are an important part of each sentence. These elements are in a whole domain of their own because they represent grammatical categories which are qualitatively different from predicates and their arguments. These categories are called operators, and they modify the clause and its parts. They include some familiar categories, like tense and aspect, and some perhaps unfamiliar, like evidentials. There are at least eight of these categories, and they are given a distinct representation from predicates and their arguments. (P.40)

The first one is **tense**. It is a category which expresses a temporal relationship between the time of the described event and some reference time, which, in the unmarked case, is the speech time. (P.40)

Another category, **aspect**, which is related to temporality, does not express this temporal relationship between event time and speech time. Indeed, it tells us about the internal temporal structure of the event itself. (P.40)

The relatively familiar operator is **negation**. Another category is **modality**, which includes such things as strong obligation (must or have to), ability (can or be able to), permission (may) and weak obligation (ought or should). In other word, modality concerns the relationship between the referent of the subject NP and the action. (P.41)

**Status** includes epstemic modality, external negation and categories like realis and irrealis. (P.41)

**Illocutionary force** is an extremely important and universal operator; it refers to whether an utterance is an assertion, a question, a command or an expression of a wish. These are different types of illocutionary force, which means that we can talk about interrogative illocutionary force, imperative illocutionary force, optative illocutionary force and declarative illocutionary force. Languages use a variety of means for signaling illocutionary force. Many languages have particles or clitics which directly signal it. Prosody is also used to indicate illocutionary force in many languages. Modality, status and illocutionary force are all conflated in traditional grammar under the term “mood”. (P.41-42)
Directionals are markers which indicate direction. They can either indicate the direction of the action itself or can indicate the direction of motion of one of the core arguments. (P.42)

Evidentials refer to the sources of information which form the basis of what we are saying. (P.43)

A crucial fact about operators is that different operators modify different layers of the clause: some only modify the nucleus, some only modify the core, and some modify the whole clause. Aspect is a nucleus modifier because it tells us about the internal temporal structure of the event itself, without reference to anything else. Some directionals are nucleus modifiers because they indicate the direction of the action without reference to the participants. On the other hand, some directionals are core in the sense that they indicate the direction of motion of one of the core arguments. Negation can be a nucleus operator, but more common is core negation. (P.45)

The basic principle of scope assignment governing operators is clausal \( \supset \) core \( \supset \) nucleus, where “\( \supset \)” mens “has scope over”. Among clausal operators, the scope relations are illocutionary force \( \supset \) evidentials \( \supset \) tense/status. Among core operators, the scope relations are modality \( \supset \) directionals \( \supset \) negation. Among nuclear operators, they are directionals/negation \( \supset \) aspect. The position of negation at the core level and directionals at the nuclear level is a function of the fact that they can also be the innermost operator at the next higher level; hence they in a sense overlap the layer boundaries (see table 2.2). (P.46)

Both RRG and FG employ layered conceptions of clause structure; the FG notion (Hengeveld 1989) is primarily semantic in nature, whereas the RRG version has both syntactic and semantic aspects. Both theories posit operators modifying different clause layers, and the two approaches are summarized in table 2.2. (P.47)

<table>
<thead>
<tr>
<th>Semantic unit</th>
<th>RRG layer</th>
<th>RRG operator</th>
<th>FG layer</th>
<th>FG operator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicate</td>
<td>Nucleus</td>
<td>Aspect</td>
<td>Predicate</td>
<td>Perf/imp aspect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negation</td>
<td></td>
<td>Phasal aspect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Directionals</td>
<td></td>
<td>Negation</td>
</tr>
<tr>
<td>Predicate +</td>
<td>Core</td>
<td>Directionals</td>
<td>Predication</td>
<td>Quantif. Aspect</td>
</tr>
<tr>
<td>argument(s)</td>
<td></td>
<td>Modality(root)</td>
<td></td>
<td>Modality, neg.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negation</td>
<td></td>
<td>Tense</td>
</tr>
<tr>
<td>Predicate +</td>
<td>Clause</td>
<td>Status, negation</td>
<td>Proposition</td>
<td>Epistemic modality</td>
</tr>
<tr>
<td>argument(s) +</td>
<td></td>
<td>Tense</td>
<td></td>
<td>modality</td>
</tr>
<tr>
<td>(Non-arg(s) )</td>
<td></td>
<td>Evidentials</td>
<td></td>
<td>Evidantials</td>
</tr>
<tr>
<td>= proposition</td>
<td></td>
<td>Illocut. Force</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposition +</td>
<td>Sentence</td>
<td>None</td>
<td>Utterance</td>
<td>IF, mode</td>
</tr>
<tr>
<td>DP elements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Operators are arranged in terms of ever wider scope with respect to the verb. This may be represented as in figure 2.15. This explicitly represents the fact that aspect is nuclear, negation is any of the above (but mostly core or clausal) and directionals are nuclear or core. Tense, status, evidentials and illocutionary force are all clausal, which means that they modify the clause (proposition) as a whole, although they do so in different ways. All of these operators at the bottom of the diagram are clausal, most of the directionals and modality are core, and some of the directionals and aspect are nuclear. The
verb is the anchoring point of these operators, and it is no accident that these are recognized as verbal categories. (P.47)
The operator projection in figure 2.15 may be combined with what we will call the “constituent projection” in figure 2.7 (see, P. 31) to yield a more complete picture of the clause, as in figure 2.16 (see P. 49); the periphery is omitted, since it can occur in a number of different positions. (P.47)

![Figure 2.15 Operator projection in LSC](image)

2.3 The layered structure of adpositional and noun phrases

2.3.1 Adpositional phrases

Adpositional phrases include prepositional phrases and postpositional phrases, ones which do not license their object will be referred to as non-predicative adposition, whereas those do function as predicates and license their object will be referred to as predicative adposition. Adpositions in the periphery of the clause are always predicative, while non-predicative adpositions normally mark oblique core arguments. (P.52)

Predicative and non-predicative PPs have different structural representations. Predicative adpositions Function as predicates and therefore have a layered structure in which there is an adpositional predicate in the nucleus, and its semantic argument is treated as a core argument structurally (see Figure 2.20a, P. 53). Non-predicative PPs, on the other hand, are not predicates and therefore lack this structure; the adposition is essentially a case marker and nothing more (see Figure 2.20b, P.53).

2.3.2 Noun phrase structure

Some nouns take arguments analogous to verbs taking arguments, so it is also appropriate to posit a layered structure for NPs (LSNP) similar but not identical to that for clauses. One significant difference, relating to the fundamental functional difference between verbs and nouns, is that NUCn dominates a
REF (for “reference”) node, indicating that the unit in question refers, in contrast to the PRED (for “predicate”) node which appears in the nucleus of a clause. The structure of NPs headed by deverbal nominals is represented in figure 2.23 (P.55). NPs headed by pronouns and proper nouns do not have a layered structure like those headed by common nouns. An important feature of the layered structure of the clause was the differential treatment given to operators like tense, aspect and illocutionary force, and the same contrast is a vital part of the layered structure of the noun phrase. NP operators include determiners (articles, demonstratives, deictics), quantifiers, negation and adjectival and nominal modifiers. The overall structure of the layered structure of the NP with its operators is given in figure 2.24. As with the layered structure of the clause, the linear order of the elements in the constituent projection can vary, while the operators may precede or follow the head noun. (P.53-66)

![Figure 2.24 The general schema of the LSNP (P.57)](image)

### 2.4 Heads and headedness

The head of a phrase is a function of its semantics: an NP is headed by a nominal nucleus, a PP by an adpositional nucleus, and a clause by a predicating nucleus. (P.64)

### 2.5 Conclusion: The nature of morphosyntactic structure

The notion of morphosyntactic structure is very much semantically based. The basic units of the layered structure of the clause is motivated by a well-defined semantic concept. The universal aspects of clause structure follow from two very basic principles which are grounded in lexical semantics: the contrast between predicating and non-predicating elements, and, among non-predicating elements, the contrast between those which are arguments of the predicating element and those which are not. (P.69)

The layered structure of the clause constituent projection for simple sentences in figures 2.7 and 2.13 can be generated by following set of immediate-dominance rules. (P.69)
Theses immediate-dominance rules are universal; they describe the basic layered structure of the clause which is a feature of the grammar of every language. The only non-universal features are the detached positions and extra-core slots; their non-universal status is indicated by ‘{}’ in the rules. There is a Kleene star on ARG within the core rule because there are languages in which argumentless verbs may be a nucleus. Languages vary in two primary ways: first, with respect to whether the arguments are free phrases, as in dependent-marking languages, or bound morpheme, as in head-marking languages; and second, with respect to linear precedence rules. In head-marking languages only the core arguments are realized by bound pronominals, while full NPs are daughters of the CLAUSE node (see section 2.2.2); therefore that part of rule (2.28 c) is not universal and is in curly brackets. (P.70)

There are universal linear precedence rules with respect to detached phrases and the pre- and postcore slots which are valid in the languages which have theses constituents. Examples of linear precedence rules for simple sentences are given in (2.29); in head-marking languages, they apply within the clause only, since the core is a single phonological word, whereas in dependent-marking languages they apply within the core and clause. (‘>’ means ‘linearly precede’.) (see, P.71)

(2.30) a. SENTENCE \rightarrow CLAUSE \leftarrow IF
b. CLAUSE\leftarrow IF \rightarrow CLAUSE \leftarrow OP*
c. CLAUSE\leftarrow OP \rightarrow CORE (\leftarrow OP*)
d. CORE (\leftarrow OP) \rightarrow NUC (\leftarrow OP*)
The first rule is very important: it states that only a CLAUSE node immediately dominated by the SENTENCE node can have an illocutionary force operator. This excludes the possibility of independent illocutionary force marking in anything except a simple matrix CLAUSE or CLAUSES in a coordinate construction. This is universally valid. The next rule states that there maybe (but need not be) multiple CLAUSE nodes modified by different clausal operators in a sentence (see figure 2.16). The next rule states that a CLAUSE node modified by an operator (which maybe illocutionary force, in the minimal case) dominates a CORE node, which may or may not have one or more core operator. The next rule, (d), provides for the transition from CORE to NUCLEAR operators, and the last rule anchors the operator projection in the predicating element, which may be a verb, adjective (phrase), NP or PP. The linear precedence rules for operators are much simpler than those for constituents: in the majority of languages they simply line up according to their scope on one side of the nucleus or the other. This is expressed in (2.31). (P.72)

(2.31)  

<table>
<thead>
<tr>
<th>a. Universal operator linear precedence rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAUSE ⊃ CORE ⊃ NUCLEAR</td>
</tr>
<tr>
<td>b. Language-specific linear precedence rules</td>
</tr>
<tr>
<td>1  Ops &gt; NUC</td>
</tr>
<tr>
<td>2  NUC &gt;OPs</td>
</tr>
</tbody>
</table>

Chapter  3  Semantic representation, I: verbs and arguments

3.0  Introduction
In this chapter the authors present a classification of the kinds of events, actions and situations that sentences express and of the roles that the participants in these states of affairs may play. (P.82)

3.1  A typology of states of affairs and their participants
Typologically, ‘state of affairs’ refers to phenomena in the world, following a tradition dating back Aristotle. There are four basic types of states of affairs: (P.83)

(3.1)  a. Situations: static, non-dynamic states of affairs which may involve the location of a participant, the state or condition of a participant, or an internal experience of a participant.
       b. Events: states of affairs which seem to happen instantly.
       c. Processes: states of affairs which involve change and take place over time, in state or condition, or in the internal experience of a participant.
       d. Actions: dynamic states of affairs in which a participant does something.

These states of affairs can vary along a number of dimensions; among them are: (1) how many participants there are; (2) whether there is a terminal point; and (3) whether the state of affairs happens spontaneously or is induced. (P.83)

All of these states of affairs may occur spontaneously or be induced or brought about in some way. Pairs of spontaneous and induced states of affairs are given in (3.2) (see P.84).

The participant role an entity has depends crucially on the state of affairs that the entity is involved in. A list of common participant roles is given below (see P.85-86).

Commonly used participant roles in states of affairs
agent: a willful, purposeful instigator of an action or event.
**effector**: the doer of an action, which may or may not be willful or purposeful.

**experiencer**: sentient beings that experience internal states, such as perceivers, cognizers and Emoters.

**instrument**: normally inanimate entities manipulated by an agent in the carrying out of an action.

**force**: somewhat like instruments, but they cannot be manipulated.

**patient**: things that are in a state or condition, or undergo a change of state or condition.

**theme**: things which are located or are undergoing a change of location (motion).

**benefactive**: the participant for whose benefit some action is performed.

**recipient**: someone who gets something (recipients are always animate or some kind of quasi-animate entity, e.g. an organization).

**goal**: destination, which is similar to recipient, except that it is often inanimate.

**source**: the point of origin a state of affairs.

**location**: a place or a spatial locus of a state of affairs.

**path**: a route.

The linguistic means for describing states of affairs typically consists of verbs and other predicating elements, which express the situation, event, process or action, and noun phrases and other referring expressions, which denote the participants. Hence what verbs mean must be in some way related to the state of affairs they express. The role that an entity plays in a state of affairs is always a function of the nature of the state of affairs, and it is nonsensical to separate participant roles from the states of affairs in which they occur. Thus it is states of affairs which are fundamental, not participant roles (see, P.89)

### 3.2 The lexical representation of verbs and their arguments

In this section they present a theory of lexical representation for verbs and their arguments which will allow us to capture how linguistic expression can code states of affairs. (P.90)

The approach to the depiction of the lexical meaning of verbs which lexical decomposition is adopted. As a simple example of the mechanism of lexical decomposition, *kill* can be paraphrased into something like ‘cause to die’, and then *die* can be broken down into ‘become dead’. Thus the lexical representation of *kill* would be something like ‘χ causes [y become dead]’. (P.90)

A system of lexical representation should include a way of expressing the fact that the subject of die and the object of kill are the same argument semantically. There are many verbs like this pairs, and in many cases the relationship between them is overt. There seems to be a pattern of intransitive verbs whose subjects are identical to the object of their transitive counterparts. An adequate theory of lexical representation should be able to capture these relationships, and lexical representation provides a promising method for doing it. (P.91)

The semantic representation of the predicate in the nucleus is the heart of the semantic representation of the clause as a whole, and as such the two representations are obviously related. However, it is always necessary to distinguish the lexical meaning of the verb (which would be found in its lexical entry in the lexicon) from the meaning it has in a particular clause in which it occur. (P.91)

#### 3.2.1 Verb classes

The system of lexical decomposition to be employed is based on the distinctions in *Aktionsart* (German for ‘form of action’) proposed originally in Vendler (1957[1967]). He argued that verbs and other predicating elements could be classified in terms of their inherent temporal properties, and proposed four basic classes: states, achievements, accomplishments and activities. States are non-dynamic and temporally unbounded. Activities are dynamic and temporally unbounded. Achievements code instantaneous changes, usually changes of state but also changes in activities as well; they have an inherent terminal point. Accomplishments are temporally extended (not instantaneous) changes of state leading to a terminal point. These classes are exemplified in (3.10).
(3.10)  

a. States: be sick, be tall, be dead, love, know, believe, have
b. Achievements: pop, explode, collapse, shatter (all intransive)
c. Accomplishments: melt, freeze, dry (the intransitive versions); learn, receive from illness
d. Activities: march, walk, roll (the intransitive versions); swim, think, rain, read

Each of these Aktionsart types corresponds to one of our basic state-of-affairs types. (P.92)

(3.11)  

<table>
<thead>
<tr>
<th>State-of-affairs type</th>
<th>Aktionsart type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation</td>
<td>State</td>
</tr>
<tr>
<td>Event</td>
<td>Achievement</td>
</tr>
<tr>
<td>Process</td>
<td>Accomplishment</td>
</tr>
<tr>
<td>Action</td>
<td>Activity</td>
</tr>
</tbody>
</table>

Situations are expressed by state verbs or predicates, events by achievement verbs or predicates, process by accomplishment verbs or predicates, and actions by activity verbs or predicates. It is important to distinguish properties of states of affairs from properties of verbs and other predicates; Aktionsart refers only to properties of linguistic predicates, not to properties of states of affairs. (P.92)

These four classes can be defined in terms of three features, [+static], [+punctual], and [+telic], which refers to whether the verb has an inherent terminal point or not. This is summarized in (3.12). (P.93)

(3.12)  

a. State                          [+static], [-telic], [-punctual]
b. Activity                       [-static], [-telic], [-punctual]
c. Accomplishment                 [-static], [+telic], [-punctual]
d. Achievement                    [-static], [+telic], [+punctual]

Most fundamental is the distinction between static and non-static verbs, which distinguishes verbs which code a ‘happening’ from those which code a ‘non-happening’. The feature ‘telic’ has to do with whether a verb depicts a state of affairs with an inherent terminal point or not. The final feature, [+punctual], distinguishes telic events with internal duration from those which lack it. (P.93)

These four classes correspond to spontaneous states of affairs, while each of the basic Aktionsart classes corresponds to causative class, which corresponds to the induced state of affairs. This is exemplified in (3.16) (P.97)

(3.16)  

a. State                          They boy is afraid.
a’. Causative state               The dog frightens/scares the boy.
b. Achievement                   The balloon popped.
b’. Causative achievement        The cat popped the balloon.
c. Accomplishment                The ice melted.
c’. Causative accomplishment     The hot water melted the ice.
d. Activity                      The ball bounced around the room.
d’. Causative activity           The girl bounced the ball around the room.

Tests which allow us to decide which class a verb belongs to (see Table 3.1) (P.94)

<table>
<thead>
<tr>
<th>Criterion</th>
<th>States</th>
<th>Achievements</th>
<th>Accomplishments</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Occurs with progressive</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2. Occurs with adverbs like vigorously, actively, etc.</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>3. Occurs with adverbs like</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
quickly, slowly, etc.
4. Occur with X for an hour, spend an hour Xing
   Yes  No  Yes  No
5. Occue with X in an hour, take an hour to X
   No  No  Yes  No
6. X for an hour entails X at all times in the hour
   Yes  d.n.a.  No  Yes
7. z is Xing entails z has Xed
   d.n.a.  d.n.a.  No  Yes

3.2.2    Lexical representations for verbs

These distinctions among the four basic Aktionsart types may be represented formally as in table 3.3. (P.102)

<table>
<thead>
<tr>
<th>Verb class</th>
<th>Logical structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td><code>predicate</code> (x) or (x, y)</td>
</tr>
<tr>
<td>Activity</td>
<td><code>do</code> (x, <code>[predicate</code> (x) or (x, y)])</td>
</tr>
<tr>
<td>Achievement</td>
<td><code>INGR predicate</code> (x) or (x, y)</td>
</tr>
<tr>
<td>Accomplishment</td>
<td><code>BECOME predicate</code> (x) or (x, y)</td>
</tr>
</tbody>
</table>

These representations are called logical structure. States are represented as simple predicates, e.g. `broken` (x), `be-at` (x, y), and `see` (x, y). There is no special formal indicator that a predicate is stative. The logical structure, `be` (x, `[pred]`) is for identificational constructions, e.g. `Sam is a policeman`, and attributive construction, e.g. `Mary is tall`. In this logical structure, the second argument is the attribute or identificational NP, e.g. `be` (Mary, `[tall]`), `be` (Sam, `[policeman]`). (P. 103)

All activity logical structures contain the generalized activity predicate `do`, which serves as the marker of membership in this class, e.g. `sing do` (x, `[sing` (x)])], `run do` (x, `[run` (x)]), `eat do` (x, `[eat` (x, y)]). Activity predicates always cooccur with `do`, which is a two-argument predicate, i.e. `do` (x, y), filling the second argument position. If the second argument position is left unspecified, i.e. `do` (x, φ), then this is the logical structure for an unspecified activity, as in English `Sally does/did`. (see, P.104)

Achievement and accomplishment verbs are composed of a state or activity predicate plus a symbol for change. `INGR` is derived from ‘ingressive’ and encodes instantaneous changes; these may be changes of state or activity. Accomplishments are coded by `BECOME`, which codes change over some temporal span, plus a state predicate, e.g. `melt` (intr.) `BECOME melt` (x), `sink` (intr.) `BECOME sunk` (x). (see, P.104)

The logical structure of causative verbs contains CAUSE, the second argument of which is the logical structure of the basic verb or predicate. This is illustrated in (3.22). (P.107)

(3.22)    a. […] CAUSE `[predicate` (x) or (x, y)]
 b. […] CAUSE `[INGR predicate` (x) or (x, y)]
 c. […] CAUSE `[BECOME predicate` (x) or (x, y)]
 d. […] CAUSE `[do` (x, `[predicate` (x) or (x, y)])
 e. […] CAUSE `[do` (x, `[predicate` (x) or (x, y)])
 f. […] CAUSE `[do` (x, `[predicate` (x) or (x, y)])

The basic set of lexical representations is restated, including causatives and active accomplishments (see table 3.4). (P.109)
Table 3.4 *Lexical representations for Aktionsart classes (revised)*

<table>
<thead>
<tr>
<th>Verb class</th>
<th>Logical structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>predicate' (x) or (x, y)</td>
</tr>
<tr>
<td>Activity</td>
<td>do' (x, [predicate' (x) or (x, y)])</td>
</tr>
<tr>
<td>Achievement</td>
<td>INGR predicate' (x) or (x, y), or INGR do' (x, [predicate' (x) or (x, y)])</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>BECOME predicate' (x) or (x, y), or BECOME do' (x, [predicate' (x) or (x, y)])</td>
</tr>
<tr>
<td>Active accomplishment</td>
<td>do' (x, [predicate' (x, (y))]) &amp; BECOME predicate' (z, x) or (y)</td>
</tr>
<tr>
<td>Causative</td>
<td>α CAUSE β, where α, β are LSs of any type</td>
</tr>
</tbody>
</table>

This theory of lexical representation is extremely powerful yet highly constrained, and it is well supported by much cross-linguistic study. The patterns found in some languages are summarized in (3.29). (P.110)

(3.29) a. State → accomplishment                                   Qiang, Tepehua, Piraha
b. Activity → accomplishment (i.e. ‘start to V’)                  Georgian, Japanese, Russian, Piraha
c. Activity → active accomplishment                                Georgian, Russian, Piraha
d. Accomplishment → causative accomplishment                      Qiang, Lakhota
e. State → causative accomplishment                                Tepehua, Lakhota
f. Causative accomplishment → accomplishment                       French, Russian, Yagua
g. Causative accomplishment → state                                French, Russian
h. Activity → causative activity                                   Tepehua, Lakhota
i. State → causative state                                        Japanese, Lakhota, Barai

From a lexical semantic point of view, one of the advantages of this system of lexical decomposition is that it makes the task of representation more manageable, because detailed definitions need be formulated only for the primitive predicates. (P.110)

### 3.2.3 The semantics of predicate-argument relations

Each of the argument positions in the logic structure defines a thematic relation, and it is necessary to refer to the arguments as ‘first argument’ or ‘second argument’ when there is more than one. In table 3.5 ‘first argument’ refers to the χ arguments in the logical structure, and ‘second argument’ refers to the y arguments. Role labels like ‘EFFECTOR’, ‘CIGNIZER’, ‘THEME’, ‘PERFORMER’ are merely mnemonics for argument positions in logical structure. ‘EXPEIENCER’ means ‘first argument of a two-place state predicate of internal experience’, ‘POSSSESSED’ means ‘second argument of a two-place state predicate of possession’ and ‘OBSERVER’ means ‘first argument of an activity predicate of directed perception’. Thus, the interpretation of an argument is a function of (1) the class or subclass of the predicate and (2) its position in the logical structure (see P.114-116)

Table 3.5 *Definitions of thematic relations in terms of LS argument positions*

<table>
<thead>
<tr>
<th>I State verbs</th>
</tr>
</thead>
</table>
The implications of this scheme for deriving thematic relations from logical structure are very important. This scheme also has important implications for how one actually goes about analyzing a language. It is important to remember that in the system being developed, thematic relations play no direct role in lexical representation; the relevant semantic properties of verbs are expressed by the decompositional logical structure representations, not by the thematic relations. (P.115-116)

### 3.2.3.1 Verbs of saying and their arguments

Verbs of saying constitute an important subclass of activity verbs. The logical structure of verbs of saying is given in (3.34). (P.117)

\( (3.34) \quad \text{do}' (x, [\text{express}(\alpha).\text{to}.(\beta).\text{in}.\text{language}.(\gamma)')(x, y)) \)

The interpretation of the \( \chi \) argument is unproblematic; it refers to the SPEAKER thematic relation for all verbs of saying. The new elements in the decompositon are the internal variables \( \alpha, \beta \) and \( \gamma \). \( \alpha \) refers to the content of utterance, \( \beta \) refers to the addressee, and \( \gamma \) refers to the language used. They are called internal variables. The most minimal possible expression involves expression of \( \chi \) alone and none of the internal variables: *Sandy spoke*. *Speak* allows each of the three internal variables to be expressed as the \( y \) argument along with the SPEAKER, as in (3.35). (P.117)
Sandy spoke but a few words.  \( y = \alpha \)
Sandy spoke to Kim.  \( y = \beta \)
Sandy spoke Telugu  \( y = \gamma \)

The selectional properties of these five verbs of saying are summarized as in (3.36)

\[
(3.36) \begin{align*}
\text{a. speak} & \quad y = \alpha & \alpha = \text{metalinguistic noun} & \text{e.g. (3.35a)} \\
& \quad y = \beta & \text{e.g. (3.35b)} \\
& \quad y = \gamma & \text{e.g. (3.35c)} \\
\text{b. say} & \quad y = \alpha & \alpha = \text{metalinguistic noun}, \text{indirect discourse complement} & \text{see above} \\
\text{c. talk} & \quad y = \beta & \text{e.g. talk to Kim} \\
& \quad y = \gamma & \text{e.g. talk Cajun} \\
\text{d. discuss} & \quad y = \alpha & \alpha = \text{topic noun} & \text{e.g. discuss the situation} \\
\text{e. tell} & \quad y = \alpha & \alpha = \text{utterance noun} & \text{e.g. tell a joke} \\
& \quad y = \beta & \text{e.g. tell Kim}
\end{align*}
\]

With some verbs it is also possible to realize the internal variables as oblique core arguments (PPs), as illustrated in (3.37). (P.117-118)

### 3.2.3.2 Agents, effectors, instruments and forces

Activity verbs raise a number of interesting issues. There is a generalized activity verb in many languages. MOVERS are EFFECTORS, but they occur with verbs of motion, PERFOMERS are also EFFECTORS that occur with performance verbs, and SPEAKERS are EFFECTORS that occur with verbs of saying, and so on. The ‘effectorhood’ of these arguments is represented in the logical structures by the fact that all activity verb logical structures contain ‘do’ (x, …’) and the formal definition of EFFECTOR is the \( \chi \) argument in this logical structure configuration. (P.118)

AGENT are always a type of EFFECTOR semantically, and this means that AGENT is in effect an overlay over other, more basic thematic relations. AGENT is always associated with an activity logical structure, and hence only verbs which have an activity predicate in their logical structure can have an AGENT argument. The logical structure of AGENT verbs are represented as ‘DO (x, [do’ (x, […’), and the formal definition of AGENT is the \( \chi \) argument in this logical structure. Thus the minimal logical structure for murder would be DO (x, [do’ (x, \( \phi \)]) CAUSE [BECOME dead’ (y)]). This explicitly represents AGENT as an overlay over the more basic EFFECTOR, MOVER, CONSUMER, etc. roles. (P.118-119)

FORCES are inanimate EFFECTORS that have two essential features in common with human and animate EFFECTORS. They can serve as the instigators of an action, event or process. INSTRUMENTS are not capable of independent motion and action and are under the control of another EFFECTOR; they are not instigators. They are closely related semantically to the IMPLEMENT arguments of two-argument activity verbs like use. The formal definitions of FORCE and INSTRUMENT are given in (3.45). (P. 121-122)

\[
(3.45) \begin{align*}
\text{a. FORCE: Inanimate ‘x’ argument in LS configuration} \\
\text{b. INSTRUMENT; IMPLEMENT ‘y’ argument in LS configuration} \\
\quad \text{[do’ (x, […])]} \text{ CAUSE [[… do’ (y, […])]} \text{ CAUSE} \\
\quad \text{[BECOME / INGR pred’ (…)]}
\end{align*}
\]
3.2.3.3 The second argument of activity predicates
The second argument of some of the multiple argument activity predicates in II B in table 3.5 has unique properties among all of the argument types given there. These verbs behave in two ways, depending upon whether the second argument is referential or not. The non-referential second argument with two-argument activity verbs, the inherent argument, is qualitatively different from the other argument types listed table 3.5. (P.122-123)
Not all two-argument activity verbs treat their second argument in this way. If it is a fully referential NP, as with the verbs below, then it is realized as an oblique core argument, as in (3.48-3.51). (P. 124)
The second argument of two-argument activity verbs like listen to (directed perception) and use (use) behave like the second arguments of other classes. This is not surprising in the case of look at, since it is the activity version of a perception verb; this is clearly reflected in its logical structure (do’ (x, [see’ (x, y)])). Like the other activity verbs discussed, the second argument is optional. (P.125)

3.2.3.4 Two-place state predicates
Most of the state predicates in table 3.5 have two arguments, and they seem to define many thematic relations. Examples of verbs from these classes are given in (3.52). (P.125)

(3.52) a. Location
  The book is on the table.  be-on’ (table, book), table = LOCATION, book = THEME

b. Perception
  Mabel saw the accident.  see’ (Mabel, accident), Mabel = PERCEIVER, accident = STIMULUS

c. Cognition
  Dana knows the answer.  know’ (Dana, answer), Dana = COGNIZER, answer = CONTENT

d. Desire
  Sam wants a new car.  want’ (Sam, car), Sam = WANTER, car = DESIRE

e. Propositional attitude
  Max believes the rumor.  believe’ (Max, rumor), Max = JUDGER, rumor = JUDGMENT

f. Possession
  Tammy has a new car.  have’ (Tammy, car), Tammy = POSSESSOR, car = POSSESSED

g. Internal experience
  Diana feels sick.  feel’ (Diana, [sick’]), Diana = EXPERIENCER, sick = SESATION

h. Emotion
  Charles hates his wife.  hate’ (Charles, wife), Charles = EMOTER, wife = TARGET

i. Attributive/identificational
  The building is tall  be’ (building, [tall’]), building = ATTRIBUTANT, tall’ = ATTRIBUTE

The logical structures in (g) and (i) are somewhat unusual, in that the second argument position is filled by a predicate, rather than a referring expression, which is normally realized as the predicate or as part of the predicate in the nucleus. (P.125)
3.2.3.5 Recipients, goals and sources

The definitions of RECIPIENT and GOAL are shown in (3.54). (P.128)

(3.54) a. RECIPIENT: first argument in LS configuration ‘…BECOME / INGR have’ (y, z)’
       b. GOAL: first argument in LS configuration ‘…BECOME / NIGR be-Loc’ (y, z)

SOURCE can be defined as in (3.55)

(3.55) SOURCE: first argument in LS configuration ‘…BECOME / INGR NOT have’ / be-Loc’ (y, z)

In terms of the thematic relations continuum in figure 3.2, RECIPIENT, GOAL AND SOURCE would fall in the third column under ‘first argument of pred’ (x, y), along with LOCATION, POSSESSOR, etc. (P.127)

<table>
<thead>
<tr>
<th>Arg. of DO</th>
<th>1st arg. of do (x, ...)</th>
<th>1st arg. of pred (x, y)</th>
<th>2nd arg. of pred (x, y)</th>
<th>Arg. of state pred (x)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENT</td>
<td>EFFECTOR</td>
<td>LOCATION</td>
<td>THEME</td>
<td>PATIENT</td>
</tr>
<tr>
<td></td>
<td>MOVER</td>
<td>PERCEIVER</td>
<td>STIMULUS</td>
<td>ENTITY</td>
</tr>
<tr>
<td></td>
<td>ST-MOVER</td>
<td>COGNIZER</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-EMITTER</td>
<td>WANTER</td>
<td>DESIRE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S-EMITTER</td>
<td>JUDGER</td>
<td>JUDGMENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PERFORMER</td>
<td>POSSESSOR</td>
<td>POSSESSED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONSUMER</td>
<td>EXPERIENCER</td>
<td>SENSATION</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CREATOR</td>
<td>EMOTER</td>
<td>TARGET</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SPEAKER</td>
<td>ATTRIBUTANT</td>
<td>ATTRIBUTE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OBSERVER</td>
<td></td>
<td>PERFORMANCE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USER</td>
<td></td>
<td>CONSUMED</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Summary

Thematic relations play no direct role in lexical representation; the relevant semantic properties of the verbs are expressed by the decompositional logical structure representation, not by thematic relations. The theoretical implications of this system for deriving thematic relations from logical structures are very important. Thematic relations cannot be assigned on an arbitrary basis, because logical structures cannot be assigned arbitrarily; rather, logical structures are determined on the basis of the test in table 3.2. Thus the great advantage of this system of lexical representation is that there are tests which provide independent criteria for assigning a particular logical structure and hence a particular argument structure to a given verb. (P.128)

This system also has important implications for how one actually goes about analyzing a language. In order to determine the argument structure of a verb, it is first necessary to ascertain its Aktionsart in the construction in which it occurs, using the tests in table 3.2. Having established that, its logical structure can be created, following table 3.4, and its argument structure follows table 3.5. Thus, it is necessary to ascertain the Aktionsart of the verb in the sentence, and from this its argument structure follows. What
is not appropriate in this system is to decide arbitrarily what thematic relations a verb should have and then to construct a logical structure which would yield those role. (P.129)

Chapter 4 Semantic representation, II: macrorole, the lexicon and noun phrases

4.0  Introduction
The authors fill in the remaining pieces that are needed for semantic representation, in particular the semantic representation of noun phrases and of clausal and NP operators, and also discuss the lexicon, focusing on what kind of information needs to be represented in lexical entries and lexical rules. (P.139)

4.1 Semantic macroroles
Semantic macroroles are generalized roles. Each of them subsumes a number of specific argument-types (thematic relations). The generalized AGENT-type role is called actor and generalized PATIENT-type role is termed undergoer. Figure 4.1 shows that the specific semantic interpretation of an argument is a function of the semantics of each verb. (P.141)

![Figure 4.1 Macroroles as generalizations over specific thematic relations](image)

These generalizations are not unique to English; they are found all languages, so they are cross-linguistically universal. The undergoer is the participant that the speaker is presenting as being most affected by the action. (P.142)

As with actor, there is a ranking hierarchy of unergoerhood, with the prototype PATIENT (i.e...pred` (x)) at the top, then the second argument of two-place state predicates (i.e...pred` (..., y)), and then the first argument of two-place state predicates (i.e...pred` (x, ...)). The alternation between THEME- and LOCATIVE-type arguments is frequent with verbs which have ‘…BECOME / INGR have` / be-Loc` //etc. (x, y)’ in their logical structure, but is not nearly as common with verbs which have ‘…BECOME / INGR NOT have / be-Loc` / etc. (x, y)’ in their logical structure. Thus, there are hierarchies of markedness for both actorhood and undergoerhood. This is summarized in the Actor-Undergoer Hierarchy in figure 4.2. (P.146)

![Figure 4.2 The Actor-Undergoer Hierarchy](image)

What this hierarchy states is that ‘argument of DO’ (AGENT) is the unmarked choice for actor and ‘argument of pred’ (x)’ (PATIENT) is the unmarked choice for undergoer. The arrows indicate increasing markedness of the occurrence of a particular argument-type as actor or undergoer. 'Argument
of DO’ is the least marked possibility for actor but the most marked possibility for undergoer. Conversely, ‘argument of pred’ (x)’ is the least marked possibility for undergoer but the most marked possibility for actor. (P.146)

4.2 Valence, transitivity and macrorole assignment

Valence means how many arguments a verb takes. This notion was first introduced independently in Tesnière (1953, 1959) and Hockett (1958). The syntactic valence of a verb is the number of overt morphosyntactically coded arguments it takes. The semantic valence of the verb refers to the number of semantic arguments that a particular verb can take. These two notions need not coincide. The two notions of valence are contrasted in table 4.1. (P.147)

<table>
<thead>
<tr>
<th>Verbs</th>
<th>Semantic valence</th>
<th>Syntactic valence</th>
</tr>
</thead>
<tbody>
<tr>
<td>rain</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>die</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>eat</td>
<td>2</td>
<td>1 or 2</td>
</tr>
<tr>
<td>put</td>
<td>3</td>
<td>3 or 2</td>
</tr>
</tbody>
</table>

Transitivity cannot be characterized in terms of the number of syntactic arguments a verb takes (its syntactic valence) but must rather be defined in terms of the number of macroroles that it takes. The authors distinguish between S-transitivity, the number of syntactic arguments, and M-transitivity, the number of macroroles. There are three transitivity possibilities in terms of macroroles: 0, 1 or 2. Zero macrorole verbs are terms ‘M-atransitive’. This is represented in table 4.2. (P.150)

<table>
<thead>
<tr>
<th>Verbs</th>
<th>Semantic valence</th>
<th>Macrorole number</th>
<th>M-transitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>rain</td>
<td>0</td>
<td>0</td>
<td>Atransitive</td>
</tr>
<tr>
<td>die</td>
<td>1</td>
<td>1</td>
<td>Intransitive</td>
</tr>
<tr>
<td>eat [ACT]</td>
<td>1 or 2</td>
<td>1</td>
<td>Intransitive</td>
</tr>
<tr>
<td>eat [ACTACC]</td>
<td>2</td>
<td>2</td>
<td>Transitive</td>
</tr>
<tr>
<td>kill</td>
<td>2</td>
<td>2</td>
<td>Transitive</td>
</tr>
<tr>
<td>put</td>
<td>3</td>
<td>2</td>
<td>Transitive</td>
</tr>
<tr>
<td>give</td>
<td>3</td>
<td>2</td>
<td>Transitive</td>
</tr>
</tbody>
</table>

4.3 lexical entries for verbs

Historically, the lexicon has been viewed as a list of irregularities, but over the last twenty-five years it has come to play a very important role in linguistic theory and analysis. The information contained in lexical entries is very important, as it consists of the crucial semantic, morphosyntactic and other properties which determine how a lexical item will behave grammatically. (P.154)

The logical structure of the verb is the heart of its lexical entry. For verbs with exceptional M-transitivity, their logical structure will be augmented by a [MRα] feature, where ‘MR’ stands for ‘macrorole’. [MR2] signals that the verb is M-transitive, i.e. takes two macroroles, [MR1] indicates that a verb is M=intransitive, and [MR0] records that the verb is M-atransitive, i.e. has no macroroles. Examples of lexical entries for a number of English verbs are given in (4.16). (P.155)
There are three types of information that are not expressed directly in logical structures which in some cases must be indicated. The first is specific requirements that a verb imposes on one or more of its arguments. The second type of information is argument identity; that is, there are verbs in whose logical structure the same referent appears in more than one argument position, as in (4.16i. l). The third type of information refers to the possibility of variable undergoer choice with a verb with three or more arguments. See (4.17). (P.157)

4.4 The representation of adjuncts and operators

4.4.1 Adjuncts: adpositions and adverbs

There are two types of adjunct: peripheral PPs and adverbs. In this section the authors examine their representation in both the semantic representation and the layered syntactic structure of the clause. (P.159)

4.4.1.1 Adpositions

Typologically, there are three types of prepositions: (1) argument-marking prepositions; (2) adjunct prepositions; and (3) argument-adjunct prepositions. (P.159)

Argument-marking prepositions, as to and from, appear to be a general pattern. The rules for assigning to and from are given in (4.18). (P.158)

(4.18) a. Assign to to noun-MR χ argument in LS segment:…BECOME / INGR pred` (x, y)
    b. Assign from to non-MR χ argument in LS segment:…BECOME / INGR pred` (x, y)

The adpositions in peripheral PP adjuncts are always predicative by definition, since they do not mark arguments of the verb (see section 2.3.). Since they modify the core as a whole, they take the logical structure of the verb of the clause as one of their arguments, as illustrated in (4.19). (P.159)

(4.19) a. Sam baked a cake in the kitchen.
    b. be-in` (kitchen, [[do` (Sam, φ)] CAUSE [BECOME baked` (cake)]])

The same representation is given to temporal adjunct PPs, as in (4.20). (P.159)

(4.20) a. Sam baked a cake after work.
    b. be-after` (work, [[do` (Sam, φ)] CAUSE [BECOME baked` (cake)]])
In both of these representations the logical structure of the event is treated as an entity being located with respect to a spatial or temporal reference point. (P.159)

Argument-adjunct prepositions are predicates, but they introduce an argument rather than a modifier. Argument-adjunct prepositions present the interesting intermediate case between argument-marking and adjunct prepositions; they are always predicative. Their logical structure introduces an argument into the core, and they either share an argument with the logical structure of the main predicate or occur as a subpart of the verb’s logical structure, as with put (see 4.22). (P.160)

There can be more than one argument-adjunct PP with some verb. There appear to be three basic situations in which the logical structure of the verb may be so augmented as to allow the occurrence of these PPs: (1) specifying the range of motion with a verb of motion (e.g. run, walk) or induced motion (e.g. push, pull, move), which includes specification of a SOURCE, a PATH and / or GOAL; (2) specifying an IMPLEMENT with certain types of activity verbs, e.g. eat, look at, sew, fight, write; and (3) specifying a beneficiary of some kind with for. (P.162)

4.4.1.2 Adverbs

Adverbs are not restricted to the periphery and may modify any layer of the clause. Semantically, the authors treat them as one-place predicates which take a logical structure or subpart of a logical structure as their argument. All adverbs, regardless of whether they appear in the periphery, left-detached position, right-detached position or precore slot, are represented in both constituent and operator projections. (P.162)

4.44.2 Operators

Operators like tense, aspect, modality and illocutionary force are very complex semantically. The authors present a substantive semantic representation for them. In order to distinguish them from them other elements in semantic representations, they are represented in italicized capitals inside of angled brackets indicating their scope in logical structure. The general schema is summarized in (4.41). (P.171)

(4.41)  <IFDEC<EVIDHS<TNISPAST<STAREAL<NEGϕ<MODOBLG<DIRϕ<PERFPROM<LS>>>>>>>>>

There is a range of values for each operator, which depends on the operator system in the language in question; for example, in a language with a past/non-past tense system, there are two values for the tense operator, whereas in a language with a past/present/future system, there are three values. (P.171)

4.5 Linking syntactic and semantic representations (a brief introduction)

There are two types of syntactic information that one might expect to be necessary in lexical entries. The first concerns the syntactic valence or S-transitivity of a verb: how many core argument positions are there in the core containing a particular verb or other predicing element? The second concerns grammatical relations of the elements that cooccur with the verb. With respect to the first issue, there is, fundamentally, a straightforward one-to-one relationship between the number of argument positions in the logical structure of the verb and the number of syntactic arguments and argument-adjuncts within the core. They formulate this more precisely in (4.47). (P.173)

(4.47) syntactic template selection principle

The number of syntactic slots for arguments and argument-adjuncts within the core is equal to the number of distinct specified argument positions in the semantic representation of the core.
Language-specific that they are not universal and specific languages may manifest one or more of them, as given in (4.48). (P.174)

(4.48) *Language-specific qualifications of the principle in (4.47)*

a. All cores in the language have a minimum syntactic valence of 1.

b. Passive constructions reduce the number of core slots by 1.

c. The occurrence of a syntactic argument in the PrCS reduces the number of core slots by 1 (may override (a)).

In every language with grammatical relations, there is a subject selection principle for multiple-argument verbs. With respect to subject selection, let us reinterpret it as a hierarchy with ‘argument of DO’ as the highest ranked argument and ‘argument of pred’ (x)’ as the lowest ranked argument. This is given in (4.51). (P.175)

The overall linking system is summarized in figure 4.9.

**SYNTACTIC FUNCTIONS:** PSA Direct core arguments Oblique core arguments

Privileged syntactic argument [PSA] selection:
- Highest-ranking MR = default (e.g. English)
- Lowest-ranking MR = default (e.g. Dyirbal)

**SEMANTIC MACROROLEs:** Actor Undergoer

<table>
<thead>
<tr>
<th>ACTOR</th>
<th>UNDERGOER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arg. of DO</td>
<td>1st arg. of do*(x, y)</td>
</tr>
<tr>
<td>[' → ' = increasing markedness of realization of argument as macrorole]</td>
<td></td>
</tr>
</tbody>
</table>

Transitivity = No. of macroroles [MRα]
- Transitive = 2
- Intransitive = 1
- Atransive = 0

Argument positions in **LOGICAL STRUCTURE**

<table>
<thead>
<tr>
<th>Verb class</th>
<th>Logical structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
<td>pred’(x) or (x, y)</td>
</tr>
<tr>
<td>ACTIVITY</td>
<td>do*(x, [predicate’(x) or (x, y)])</td>
</tr>
<tr>
<td>ACHIEVEMENT</td>
<td>INGR predicate’(x) or (x, y)</td>
</tr>
<tr>
<td>ACCOMPLISHMENT</td>
<td>BECOME predicate’(x) or (x, y)</td>
</tr>
<tr>
<td>ACTIVITY ACCOMPLISHMENT</td>
<td>do*(x, [predicate’1(x, y)]) &amp; BECOME predicate’2(z, x) or (y)</td>
</tr>
<tr>
<td>CAUSATIVe</td>
<td>α CAUSE β, where α, β are LSs of any type</td>
</tr>
</tbody>
</table>

Figure 4.9 System linking semantic and syntactic representations

The term ‘privileged syntactic argument’ (PSA) can be considered to be equivalent to ‘syntactic subject’ for this section. The notion of privileged syntactic argument will be developed and explicated in chapter
6. The authors have discussed logical structures, macroroles and the hierarchy linking them earlier in this chapter. This part of the system is universal, in that there is very little cross-linguistic variation. Where languages differ substantially is how macroroles and other arguments link into the syntax. The arrows are double-headed, because the linking system works both from semantics to syntax and from syntax to semantics. (P.177)

4.6 Lexical rules

The authors consider the possible lexical rules in (4.53). (P.180).

(4.53) a. Activity [motion] \(\rightarrow\) active accomplishment: given an activity LS \(\text{do}'(x, [\text{pred}'(x)])\), add ' & \text{BECOME be-LOC'}(y, x)' to form an active accomplishment LS.

b. Activity [consumption] \(\rightarrow\) active accomplishment: given an activity LS \(\text{do}'(x, [\text{pred}'(x, y)])\) ' & \text{BECOME consumed'}(y)' to form an active accomplishment LS.

c. Activity [creation] \(\rightarrow\) active accomplishment: given an activity LS \(\text{do}'(x, [\text{pred}'(x, y)])\), add ' & \text{BECOME exist'}(y)' to form an active accomplishment LS.

It is clear that for Lakhota and Tepehua it would be appropriate to posit derivational rules to derive accomplishment verbs in the lexicon: Such rules would resemble those in (4.58). (P.181)

(4.58) a. Lakhota

\[
\text{state/achievement/accomplishment stem + instrumental prefix } \rightarrow \\
\text{causative achievement/accomplishment} \\
\text{(BECOME/INGR) pred'}(y) + kA- / yA- / yu- ... / nA- \rightarrow \\
[\text{do}'](x, [...]) \text{ CAUSE [BECOME / INGR pred'}(y)] \\
\text{activity tem + instrumental prefix / causative suffix } \rightarrow \text{causative activity} \\
[\text{do}'(y, [\text{pred}'](y)) + yu- or yA- } \rightarrow \text{[do}'(x, \phi)] \text{ CAUSE [do}'(y, [\text{pred}'](y)))]
\]

b. Tepehua

\[
\text{state + $\tau$A- } \rightarrow \text{achievement/accomplishment, pred'}(y) + \tau A- \rightarrow \text{BECOME/INGR pred'}(y) \\
\text{achievement/accomplishment + mA- } \rightarrow \text{causative achievement/accomplishment} \\
(\tau A- \rightarrow \phi/ mA- \rightarrow \_ ) \text{BECOME / INGR pred'}(y) + mA- [\text{do}'(x, [...])] \text{CAUSE [BECOME / INGR pred'}(y)] \\
\text{activity + mA- } \rightarrow \text{causative activity} \\
[\text{do}'(y, [\text{pred}'](y)) + mA- [\text{do}'(x, \phi)] \text{ CAUSE [do}'(y, [\text{pred'}(y))])
\]

For languages Yagua, on the other hand, some achievement and accomplishment verbs are clearly derived from their causative counterparts morphologically, and the lexical rule for this would be one like that in (4.59). (P.181)

(4.59) Yagua

\[
\text{causative achievement/accomplishment + -y } \rightarrow \text{achievement / accomplishment} \\
\text{[do}'(w, [...]) \text{ CAUSE [BECOME / INGR pred'}(x)] + -y \rightarrow \text{BECOME / INGR pred'}(x)
\]

Georgian and Russian code activity-active accomplishment alternation morphologically with at least some verbs, e.g. Russian ‘eat’ est’(activity) vs. s‘est’ (active accomplishment, Georgian ‘write’ c’er (activity) vs. dAc’er (active accomplishment. Treating both Russian s- and Georgian dA- as preverbs, their logical structure in (4.60). (P.183)

(4.60) Georgian / Russian

\[
\text{activity + preverbs } \rightarrow \text{active accomplishment}
\]
do′ (x, [...]) + preverb → do′ (x, [pred′ (x, y)]) \& BECOME pred′ (y)

4.7 The semantic representation of nouns and noun phrases

4.7.1 Semantic properties of nouns

In order to capture semantic properties of nouns, Pustejovsky (1991, 1995) proposes a theory of nominal qualia to characterize the semantics of nominals. It is summarized in (4.62). (P.184-185)

(4.62) Qualia theory

a. Constitutive role: the relation between an object and its constituents, or proper parts
   1  material
   2  weight
   3  parts and component elements
b. Formal role: that which distinguishes the object within a larger domain
   1  orientation
   2  magnitude
   3  shape
   4  dimensionality
   5  color
   6  position
c. Telic role: purpose and function of the object
   1  purpose that an agent has in performing an act
   2  built-in function or aim that specifies certain activities
d. Agentive role: factors involved in the origin or ‘bringing about’ of an object
   1  creator
   2  artifact
   3  natural kind
   4  causal chain

The lexical entry for each noun will contain a set of qualia, \{QC, QF, QT, QA\}, which represent its primary semantic properties, much like a logical structure represents the primary semantic properties of a verb. Combining the two yields a more complete semantic representation for a clause, as in (4.65). (P.185)

(4.65) a. The door opened.
   b. BECOME open′ ([door (x),\{QC, QF, QT, QA\}]

4.7.2 Deverbal nominals

Nunes (1993) shows a deverbal nominal takes an undergoer as its single macrorole if the verb from which it is derived contains a state predicate, otherwise an actor. This means that only deverbal nominals derived from activity verbs will take an actor as their single direct, of-marked core argument. This is illustrated in the following examples from Nunes (1993). (The subscripts ‘CL-A’ and ‘CL-U’ stand for ‘clausal actor’ and ‘clausal undergoer’, respectively.) (P.186-187)

(4.70) Deverbal nominals from state, achievement and accomplishment verbs (±causative)

a. Sara knows French.
   a’. some knowledge of Frech CL-U /* of Sara CL-A
b. The balloon popped.
   b’. the popping of the balloon CL-U
c. The cat popped the balloon.  
c’ the popping of balloon CL-U by the cat CL-A 
c’’ *the popping of the cat CL-U [must be interpreted as undergoer]

d. Chris died.  
d’ the death of Chris CL-U 

e. The enemy destroyed the city.  
e’ the destruction of the city CL-U by the enemy 
e’’ *the destruction of the enemy CL-A [must be interpreted as undergoer]

(4.71) Deverbal nominals from activity verbs
a. The dog barked.  
a’ the barking of the dog CL-A 

b. The wheel is rotating.  
b’ the rotation of the wheel CL-A 

(4.72) Deverbal nominals from activity / active accomplishment verbs
a. The killer bees attacked the dog.  
a’ the attack of the killer bees CL-A on the dog CL-U 
a’’ the attack on/*of the dog CL-U by the killer bees CL-A 

b. Sherlock Holmes investigated the murder.  
b’ the investigation of Sherlock Holmes CL-A into the murder CL-U 
b’’ the investigation of the murder CL-U by Sherlock Holmes CL-A 

The general rule for agent nominalizations would look like (4.73). (P.188)

(4.73) \text{verb} + -er \rightarrow \text{[N verb} + \text{er]} 'xi which \text{verbs}' ([LS…(x_i,…)…]), where ‘x’ is the actor argument in the logical structure

Tepehua has extensive valence-increasing verb morphology, and many of the derived forms are nominalizations of the added argument. There are three logical structures in (4.74): the basic activity logical structure in (a), the minimal active accomplishment logical structure in (b) and the expanded active accomplishment logical structure in (c), which is a crude approximation of what a detailed decomposition of \text{wash} would be like. (P.189)

(4.74) a. do’ (x, [wash’ (x, y)])  
b. do’ (x, [wash’ (x, y)]) \& \text{[BECOME washed’ (y)]}  
c. [do’ (x, [take.(\alpha).put.(\alpha\land y).in.(\beta).rub.(y).on.(\gamma)’]) \& \text{BECOME washed’ (y)]}

4.7.3 Possessive phrases and NP adjuncts
Possessive phrases obviously involve the notion of possession, which is essentially a predication relation (see section 3.2.3.4). Hence it makes sense to represent possession within NPs semantically the same way as it is represented semantically within clause. There are important distinctions among alienable, inalienable and kin possession. Inalienable possession involves a part-whole relation between the possessor and the possessed, e.g. a table and its legs, a bird and its wings, etc. As such, inalienable possession is related to the constitutive role of the nominal qualia (see (4.62a3)) and involves what we may call ‘necessary possession. Alienable possession, on the other hand, is not based on a part-whole relation and is contingent possession, e.g. a man and his car, a boy and his toy, a woman and her jewelry.
In order to distinguish these two types of possession, the authors use the predicate `have.as.part` for inalienable possession, and `have.as.kin` for kin possession. (P.189-190)

In many languages, special constructions and forms exist for the expression of kin relations. There are special pronominal forms and constructions for expressing kin possession in Mparntwe Arrernte (an Australian Aboriginal language, Wilkins 1989). They are illustrated in (4.75); the contrasting non-kin possessive forms for first and second person are given as well. (P.191)

(4.75) a. Pronominal forms for kin possession
   - Atye  ‘1sg kin possessor’ e.g. yAy-Atye ‘my sister’
       (cf. Atyenhe-‘my’)
   - Angkwe ‘2sg kin possessor’ e.g. me-Angkwe ‘your mother’
       (cf. ngkwinhe-‘your’)
   - ikwe ‘3sg kin possessor’ e.g. Atyerr-ikwe ‘his/her dreaming totem’

b. Special dative of kin possession construction
   (i) atyenge akngeye
       1sgDAT father
       ‘my father’
   (ii) Toby-ke alere
       -DAT child
       ‘Toby’s child’

The logical structures for clausal adjuncts are given in (4.77). (P.192)

(4.77) a. be-in’ (bedroom, table) the table in the bedroom
       a’. be-in’ (bedroom, table) the bedroom with the table in it
       b. be-on’ (shelf, book) the book on the shelf
       b’. be-on’ (shelf, book) the shelf with the book on it
       c. be-after’ (interview, meeting) the meeting after the interview
       c’. be-after’ (interview, meeting) the interview with the meeting after it

Clausal logical structures containing possessive NPs and NPs containing adjuncts are given in (4.78). (P.192)

(4.78) a. see’ (I, [be-in’ (bedroom, table)] ‘I saw the table in the bedroom.’
       b. [do’ (baby, )] CAUSE [BECOME broken’ ([have’ (Paul, watch)])]
          ‘The boy broke Paul’s watch.’

4.7.4 Pronouns and reflexives

Pronominal elements are present in the semantic representation of a sentence, as are the kind of independent reflexive elements found in languages like English, German, Japanese and many others. Accordingly, the sentences in (4.79) would have the accompanying logical structures in their semantic representations. (P.192-193)

(4.79) a. Chris saw pat.
       a’. see’ (Chris, Pat)
       b. He saw Jose.
       b’. see’ (3sgM, Jose)
       c. Fatima saw herself.
       c’. see’ (Fatima, herself)
Most pronouns exhaustively fill an argument position in a logical structure, the way '3sgM' fill the first argument position in (4.79b') and herself fills the second argument position in (c'). There is, however, an interesting exception to this generalization. It is one-pronominalization, as in (4.80). (P.193)

(4.80)  a.  I bought one.
      b.  I saw the tall one with blond hair.

In (a) one functions as a complete core argument of buy. The interesting case is (b), in which one expresses a subpart of an argument. Generalizing across to one is a predicate plus its primary argument; the identity of the primary argument is a function of (1) the type of nominalization, and (2) the Aktionsart of the verb from which the nominal is derived. (P.193)

4.7.5 NP operators
The NP operators are summarized in (4.82). (P.194-195)

(4.82)  <DEICPROX<DEF+<NEGΦ<QNTΩ<NUMSG<NASP<OUNT<LS>>>>>>>>

Chapter 5  Information structure
The study of information structure goes back to the beginnings of modern linguistics, to the work of the Czech linguist Mathesius in the 1920s (Mathesius 1928, 1929). In recent years advances in understanding how information structure affects syntactic structure have been made by Kuno (1972a, 1972b, 1975), Sgall, Hajicová and Panevová (1986), Firbas (1964, 1966, 1992), Halliday (1967,1985), Prince (1981a, b), Chafe (1976, 1987), Dryer (1996a), Lambrecht (1986, 1987, 1994), and others. It is largely Lambrecht’s work which forms the basis of the conception of information structure developed in this chapter. (P.199)

What is information? Lambrecht argues that there is ‘a distinction…between (i) the pragmatic states of the denotata of individual sentence constituents in the minds of the speech participants, and (ii) the pragmatic relations established between these referents and the propositions in which they play the role of predicates or arguments. (P.199-200)

A summary of the distinctions among the activation states of referents is given in figure 5.1 (from LaPolla 1995a: 305, based on Lambrecht 1994: 109). (P.201)

---

Figure 5.1  The cognitive states of referents in discourse
When a referent is introduced for the first time into the discourse, it is a ‘new’ referent, and in many languages will be coded as an indefinite NP. A new referent may also be introduced ‘anchored’ to some more identifiable referent, as in a guy I know from school, and in these cases the language may often allow it to be used as a topic. Prince (1981b) uses the terms ‘brand-new’ unanchored referent and anchored referent to distinguish these two types of ‘new’ referent. In further mentions of a referent after its introduction it will of course be treated as identifiable. (P.200)

If a referent is identifiable to the addressee, then it will be in one of three action states: active, if it is the current focus of consciousness, accessible, if it is textually, situationally or inferentially available by means of its existence in the physical context or its relation to something in the physical or linguistic context but is not yet the current focus of consciousness, or inactive, if it is in the hearer’s long-term memory, yet not in his short-term memory (i.e. not in either the focus or periphery of consciousness). These terms are from Chafe (1987). (P.200)

The particular form that the representation of a referent takes in a particular stretch of discourse is determined by a variety of factors involved in the total context, including activation status, information structure and certain language-specific factors such as politeness strategies and tendency to use ellipsis. Underlying all of these factors is the assumption on the part of the hearer mentioned earlier that the speaker will choose a form for the sentence that will allow the speaker to create the proper (i.e. most relevant) context of interpretation with the least amount of processing effort. Different types of coding can then be seen as guaranteeing different degrees of accessibility: zero marking guarantees that the referent intended is the most accessible one, generally an active referent, e.g. a current topic of conversation; use of a pronoun guarantees that the referent intended is either active (especially if unstressed) or at least accessible (if stressed); use of a definite NP guarantees that the referent intended is identifiable, and generally either inactive or accessible; use of an indefinite NP generally tells the hearer that the referent is not identifiable in the current context and hence is a new referent being introduced into the context. (P.200-201)

5.1 Focus structure

In most communicative situations, when a speaker makes a statement, she makes what we will call a ‘pragmatic assertion’ or simply ‘assertion’. This assertion is a piece of information, a proposition the speaker hopes the addressee will come to know or be aware of as a result of the sentence having been uttered. The assertion is a ‘pragmatic assertion’ because it is a pragmatically structured utterance, generally involving both ‘old’ information, such as the topic and the presuppositions associated with the topic, and ‘new’ information, such as the comment about the topic. All languages have some grammatical system for marking which type of information is which within the utterance; it may involve intonation, morphological marking, word order and some combination thereof. This assertion of a particular information structure with a particular morphosyntactic or intonational structure Lambrecht calls the ‘focus structure’ of the sentence. (P.201)

Lambrecht (1994) gives the following definitions for the terms we have introduced so far: (P.202)

**Pragmatic assertion**: the proposition expressed by a sentence which the hearer is expected to know or believe or take for granted as a result of hearing the sentence uttered.

**Pragmatic presupposition**: the set of propositions lexico-grammatically evoked in an utterance which the speaker assumes the hearer already knows or believes or is ready to take for granted at the time of speech.

**Focus, or focus of the assertion**: the semantic component of a pragmatically structure proposition whereby the assertion differs from the presupposition.

**Focus structure**: the conventional association of a focus meaning [distribution of information] with a sentence.
An active referent makes the most acceptable topic, an accessible but not active topic makes a somewhat less acceptable topic, an inactive referent makes an even less acceptable topic, and an anchored brand-new referent makes one of the least acceptable topic. In the extreme case, where a topic is not identifiable (i.e. an unanchored brand-new referent), the utterance will require pragmatic accommodation ('going along with’ the use of an unidentifiable referent as topic) in order to be interpreted correctly, or otherwise it may not be processable at all. Lambrecht (1994:165) summarizes this scale of acceptability as the Topic Acceptability Scale (table 5.1). (P.204)

<table>
<thead>
<tr>
<th>Table 5.1 The Topic Acceptability Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
</tr>
<tr>
<td>Accessible</td>
</tr>
<tr>
<td>Inactive</td>
</tr>
<tr>
<td>Brand-new anchored</td>
</tr>
<tr>
<td>Brand-new unanchored</td>
</tr>
</tbody>
</table>

On the other hand, The authors come up with a scale of markedness relations between the form of a referring expression and its function as topic or focus, which is summarized in figure 5.2 (see Givón 1983, Levinson 1987, Gundel, Hedburg and Zacharski 1993, Ariel 1990 and Lambrecht 1994). (P.205)

5.2 Focus types
Lambrecht presents a taxonomy of the different types of focus structure found in the world’languages, and discusses the morphosyntactic constructions used in representing them. Narrow focus is when a single constituent, such as an NP, is focused. Broad focus is when the focus includes more than one constituent. It may include all but the topic, as in the common ‘topic-comment’ construction, which Lambrecht calls predicate focus, or it may include the entire sentence, which Lambrecht calls sentence focus. (P.206)

These focus types correlate with three different communicative functions, i.e. identifying a referent, commenting on a topic and reporting event or presenting a new discourse referent, respectively.

5.2.1 Predicate focus
Predicate focus is the universally unmarked type of focus structure. In this type there is a topic within the pragmatic presupposition, while predicate phrase expresses a comment about the topic. Here are some examples (Lambrecht 1994: 223): (P.206)
(5.1) Q: What happened to your car?
A: a. My car/it broke DOWN. English
   b. (Lamia macchina) si è ROTTA. Italian
   c. (Ma voiture) elle est en PANNE French
   d. (Kuruma wa) KOSYOO-SI-TA Japanese

The information structure of this example can be represented as follows (see Lambrecht 1994: 226):

(5.1’) Sentence: My car broke DOWN.
Presupposition: ‘speaker’s car is available as a topic for comment x’
Assertion: ‘x = broke down’
Focus: ‘broke down’
Focus domain: verb plus remaining postverbal core constituents

5.2.2 Sentence focus
In a sentence-focus construction the entire clause is within the focus domain, so there is no topic. No pragmatic presuppositions (other than non-distinctive presuppositions that would be involved in any focus type) are formally evoked by sentence-focus structures. Consider the following examples (Lambrecht 1994: 223): (P.207)

(5.3) Q: What happened?
A: a. my CAR broke down. English
   b. Mi si è rotta la MACCHINA. Italian
   c. J’ai ma VOITURE qui est en PANNE. French
   d. KURUMA ga KODYOO-si-ta. Japanese

Here there is no presupposition, the assertion and the focus coincide and the focus domain is the clause: (P.207)

(5.3’) Sentence: My CAR broke down.
Presupposition: none
Assertion: ‘speaker’s car broke down’
Focus: ‘speaker’s car broke down’
Focus domain: clause

Comparing these examples with those in (5.1), we see that Italian and French use a different word order for this type of pragmatic structure, Japanese uses a different morphological marking together with pitch prominence on both the subject NP and the predicate phrase, while English relies on stress on the subject alone to express the pragmatic difference. What the structures in all these languages have in common is the marking of the subject as a non-topic, and this lack of a subject-topic is one of the features that distinguishes marked focus structure (narrow-and sentence-focus structure) from unmarked focus structure (predicate-focus structure). (P.208)

5.2.3 Narrow focus
In a narrow-focus structure, the focus domain is limited to a single constituent, and any constituent, be it subject, object, oblique NP or nucleus, can be the focused constituent. Compare the following examples with those in (5.1) and (5.3). (P.208)

(5.5) Q: I heard your motorcycle broke down.
A.  a. My CAR broke down.                                English  
b. Sì è rotta la mia MACCHINA. /È la mia MACCHINA che si è rotta.    Italian (lit. ‘broke down my car’/ It’s my car which broke down )  
c. C’est ma VOITURE qui est en panne.        French (‘It is my car which broke down’)  
d. KURUMA ga kosooy-si-ta.                        Japanese  

In this structure the proposition ‘something of the speaker’s broke down’ is part of the pragmatic presupposition, the assertion is that it is the speaker’s car that broke down, the focus is ‘car’, and the focus domain is the whole NP. The focus domain is restricted to the single constituent. We can represent the information structure of this example as follows: (P.209)

(5.5”) Sentence:  
Presupposition:                   ‘speaker’s x broke down’  
Assertion:                           x = ‘car’  
Focus:                                 ‘car’  
Focus domain:                    NP  

In Lambrecht (1994, section 5.6), a distinction is drawn between marked and unmarked narrow focus, and this is a very useful contrast. The difference lies in the position of the narrow-focused constituent. Many languages have a clearly defined unmarked focus position in the clause; in verb-final languages, it is normally the immediately preverbal position (Kim 1988), as in Korean (Kim 1988, Yang 1994) and Kaluli (Schieffelin 1985). In English, the unmarked focus position is the final position in the core, which may or may not be the final position in the clause. Unmarked narrow focus is that falling on an element in the unmarked focus position, whereas marked narrow focus is that falling on an element in a position in the clause other than the unmarked focus position. English sentence with the different focal stress possibility indicated(see examples (5.6)). (P.209)

5.3       The morphosyntactic coding of focus structure
All of the languages use intonation to some extent in marking the different focus structure construction; they differ in terms of what other syntactic or morphological means they use in addition to intonation. In English the same syntactic structure can be used for all three types of focus structure, with each type being differentiated only by differences in accentuation. In a predicate-focus structure the accent is on the predicate phrase, and the subject NP is generally unaccented; in a sentence-focus structure and a marked narrow-focus structure the accent is on the focal NP and not on the predicate phrase. That the focus constituent in a narrow-focus structure is the only accented constituent in the sentence. Thus there is an important correlation between intonation and focus structure, as has been often noted (see e.g. Kempson 1975, Selkirk 1984, Steedman 1991, Lambrecht 1994). In English, aside from accentuation, it is also possible to use marked word orders to express narrow- or sentence-focus structure, such as using the narrow-focus cleft construction in It was Robin that hit you. (P.210)
In the Japanese examples different focus structures are distinguished by a combination of intonation and morphological marking, essentially the use of different postpositions either wA or gA. The particle wA marks a topic in a predicate-focus sentence such as example (5.1d), while gA may mark a sentence-focus structure, as in example (5.3d), if it is unstressed, or a narrow-focus structure, as in example (5.5d), if it is stressed; Kuno (1973) refers to these as ‘neutral description gA’ and ‘exhaustive listing gA’, respectively. (P.210-211)
In both French and Italian there is a restriction on focal elements appearing preverbally, and therefore it is not possible to mark a sentence-focus or narrow-focus construction simply by accenting a preverbal NP as in English. (P.211)
The constraint that these two languages share against preverbal focal NPs is actually not uncommon in the languages of the world. (P.211)
In Sesotho, one of the Sotho languages of southern Africa (Demuth 1989, 1990), there is an absolute constraint against focal elements appearing preverbally. This is an S V O language, accordingly subjects must be ‘highly topical, old, given information. (Demuth 1989). (see (5.10), P.212) From these facts we can see that languages differ in terms of what the authors call the potential focus domain, that is, the syntactic domain in which the focus element(s) may occur. What Lambrecht calls the ‘focus domain’, the actual part of the sentence in focus in the construction, the authors refer to as the actual focus domain. In English, the focus can be anywhere in the clause, and so the potential focus domain is the entire clause, while in many other languages, such as Italian, French, Chinese and Sesotho, the potential focus domain is generally limited to the verb and postverbal positions within the clause. (P.212)

5.4 The formal representation of focus structure

The authors represent focus structure as a separate projection. Though graphically separate, the focus projection is closely related to the constituent projection because of the influence of focus structure on constituent structure in many languages and because the constituents of the constituent projection define the focus domains. The focus structure projection is also closely related to the operator projection in that the potential focus domain must fall within the scope of the illocutionary force operator. The node anchoring the focus structure projection is labeled ‘speech act’, because the focus structure projection represents the division of the utterance, which is a speech act of some type (declarative, interrogative, etc.), into presupposed (non-focal) and non-presupposed (focal) parts. In these representations, the ‘ARG,’ ‘NUC’ and ‘ADV’ nodes are the basic information units in the focus structure projection (see section 5.1). The potential focus domain and actual focus domain will be represented as in the example of a predicate-focus structure in figure 5.3. (P.215)

Here the potential focus domain is the entire clause, and the actual focus domain is the nucleus plus the postnuclear arguments, with the sentence-initial NP as the topic of the sentence. In English the potential focus domain is the entire clause, with the actual focus domain being determined largely by intonation, unless there is an element in the precore slot. In Sesotho and in Italian sentences that do not contain interrogative pronouns (which appear in the precore slot in Italian) the
potential focus domain is always limited to the nuclear and postnuclear elements, as any prenuclear elements will always be interpreted as topical. (see Figure 5.5, P.216)

In the representations given above, only the constituent and focus structure projections are given. It is possible, however, to represent all three projections. This is illustrated in figure 5.6. (P.217)

There is an important difference between the relationship of the operator projection to the constituent projection and the relationship of the focus structure projection to the constituent projection. The operator projection has the same hierarchical structure as the constituent projection, and the operators modify the layers in this hierarchical structure. The focus structure projection, on the other hand, divides the linear string of elements in the constituent projection first into those elements within the potential focus domain and those outside of it and, second, within the potential focus domain, into those elements which are within the actual focus domain and those which are not. (P. 217)

Focus structure projection

Figure 5.6 Clause structure with constituent, operator and focus structure projections

5.5 Focus structure and the scope of negation and quantification

Focus structure is crucially involved in the interpretation of negation and quantification. The part of the sentence that is interpreted as being negated is normally referred to as ‘being in the scope of the negation’. Thus, given a sentence like John didn’t talk to Mary, the interpretation of what is being negated will be a function of the focus structure of the sentence (itself a function of the context) as reflected in intonation. (P.219)

(5.15) a. JOHN didn’t talk to Mary [Bill did].
   b. John didn’t TALK to Mary [he sent her e-mail].
   c. John didn’t talk to MARY [he talked to Susan].
   d. John didn’t TALK TO MARY [he had no contact with anyone].
The first three examples involve narrow focus, and in each instance the focus constituent is interpreted as being in the scope of negation, the remainder of the sentence being presupposed. The Final example is of a predicate-focus construction, and here the entire predicate phrase is negated.

Focus structure may also affect the interpretation of quantified NPs in a sentence. Given a sentence like (5.18a), with a universally quantified subject and an existentially quantified object, there are two interpretations for it, which are presented in (b). (P.220)

(5.18)  a. Every girl kissed a boy.
       b. (i) Each girl kissed a different boy (‘for each girl there is a boy such that the girl kissed the boy’, i.e. \[\forall x, \exists y (\text{kiss}^* x, y), \text{where } x = \text{girl} \text{ and } y = \text{boy}\])
       (ii) Each girl kissed the same boy (‘there is a boy such that for each girl, the girl kissed the boy’, i.e. \[\forall y, \exists x (\text{kiss}^* x, y), \text{where } x = \text{girl} \text{ and } y = \text{boy}\])

       c. A boy was kissed by every girl. (= (b ii), (b i))

If we look at these examples in terms of focus structure, there is a simple generalization capturing the facts; it is given in (5.20). (P.221)

(5.20) **Principle constraining the interpretation of quantified NPs**

Topical quantified NPs have scope over focal quantified NPs, i.e. topical Q \(\supset\) focal Q.

Ioup (1975) argues for two sets of factors affecting the interpretation of quantifier scope in sentences with multiple quantifiers. They are given in table 5.2. (P.222)

<table>
<thead>
<tr>
<th>Quantifiers Hierarchy</th>
<th>Greatest inherent tendency</th>
<th>least inherent tendency</th>
</tr>
</thead>
<tbody>
<tr>
<td>each &gt; every &gt; all &gt; most &gt; many &gt; several &gt; some (+NP pl) &gt; a few</td>
<td>Toward wide scope</td>
<td>least individualization, specificity</td>
</tr>
</tbody>
</table>

Table 5.2 **Factors affecting the interpretation of quantifier scope, from Ioup (1975)**

<table>
<thead>
<tr>
<th>Grammatical function Hierarchy</th>
<th>Greatest tendency toward wide scope</th>
<th>Least tendency toward wide scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic &gt; Deep and Surface Subject &gt; Deep Subject or Surface Subject &gt; IO &gt; Prep O &gt; DO</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ioup omits \(A + \text{NP}_{sg}\) due to uncertainty as to its exact placement on the hierarchy; she speculates that it would be placed after each and every. She also omits some + NP_{sg}. Ioup argues that the semantic properties of the quantifiers themselves strongly affect their scope interpretation, and she speculates that each, being at the top of the hierarchy, would always have wide scope. Her hierarchy interacts with the principle in (5.20) in an interesting way. (P.222)

Kuno (1991) also presents a number of factors affecting the interpretation of quantified NPs; he includes Ioup’s hierarchy among them. Some of the other factors are listed below, and two of them, ‘More discourse-linked Q > Less discourse-linked Q’ and ‘Topicalized Q > Non-topicalized Q’, are clearly related the principle in (5.20). By ‘topicalized’ Kuno means that the quantified NP appears in a special position at the beginning of the sentence, such as the left-detached position or the precore slot. (P.223)

**Factors affecting the interpretation of quantifier scope (from Kuno 1991)**

- Lefthand Q > Righthand Q
- Subject Q > Non-subject Q
- More discourse-linked Q > Less discourse-linked Q
Thus, focus structure is crucially involved in the interpretation of the scope of negation and quantified NPs. It is not, however, the only factor, as Ioup’s and Kuno’s contributions show. (P.223)

5.6 Intrasentential pronominalization

An extremely important problem which all syntactic theories attempt to deal with is ‘intrasentential pronominalization’, that is, the issue of determining when a pronoun will have a coreferential or non-coreferential interpretation with a lexical NP within the same sentence. The pioneers in the development of information-structure-based explanations for intrasentential pronominalization are Kuno (1972a, b, 1975), Bickerton (1975) and Bolinger (1979). Though they differ in the terminology used and in the details of their analyses, they all essentially worked with the concepts of information structure that the authors introduced earlier. They will present the important conclusions of their work using Lambrecht’s terminology. (P.223)

Before one can describe the constraints on possible coreference in pronominalization, it is necessary to specify the structural domain in which intrasentential pronominalization is possible. It is not possible within the domain of obligatory reflexivization. Intrasentential pronominalization is only possible outside the domain of obligatory reflexivization, i.e. either when the lexical NP or the pronoun is not a core argument, e.g. a possessor, when both are non-core arguments, or when the lexical NP and the pronoun are in different cores within a single clause. This is illustrated in (5.23). (P.224)

(5.23) a. Mary’s mother loves her/j.
b. Bill asked Susan to help him/j.

The main principle that Bolinger, Bickerton and Kuno propose to explain when intrasentential coreference is possible between two elements not in the domain of obligatory reflexivization may be formulated as in (5.24). (P.224)

(5.24) **Principle governing intrasentential pronominalization (preliminary formulation)**
Coreference is possible between a lexical NP and a pronoun within the same sentence if and only if the lexical NP is outside of the actual focus domain.

An important feature of the principle of intrasentential pronominalization is that it makes no direct reference to linear order. The irrelevance of linear order in some cases is illustrated by the following examples from Bickerton (1975: 26). In these examples, small capitals mark focal stress, and italics marks an item outside of the actual focus domain; the * indicates ungrammaticality with regard to the specified interpretation of coreference. All of sentences are grammatical if non-coreference is assumed. (P.225)

(5.26) a. My punching Billi annoyed HIMi.
b. * My punching himi annoyed BILLi.
c. What annoyed Billi was my punching HIMi.
d. * What annoyed himi was my punching BILLi.
e. * It was my punching BILLi that annoyed himi.
f. It was my PUNCHING Billi that annoyed himi.
g. It was my punching HIMi that annoyed Billi.
h. It was my PUNCHING himi that annoyed Billi.
In each of the sentences which permit a coreferential interpretation, the lexical NP is outside of the actual focus domain, while the pronoun is either focal (5.26a, a, g) or also outside of it as well (5.26f, h). In (5.26b), (5.26d) and (5.26e), the lexical NP is focal, and the only interpretation possible is one of non-coreference. This principle is not the whole story, though, as there are some problematic cases where the pronoun precedes the lexical NP antecedent, as in (5.27). (P.225)

(5.27)  a. * Hei asked Susan to help Billi.
        b. Heri/j mother loves Maryi.

While (5.27a) satisfies the principle that the lexical NP must be outside of the actual focus domain for a coreference interpretation to be possible, it allows only a non-coreference interpretation. In the case of (5.27b), there is again an unmarkedness topic form (a pronoun) in the unmarked position for a topic, and at the same time there is an unmarked focal form (a lexical noun) in the unmarked focus position. The actual interpretation depends upon the focus structure. (P.225)

There are times, however, when a pronoun can precede a lexical NP and the coreference interpretation is still possible, as in (5.26g,h), and in the following examples (b) and (c) are attested utterances from Carden 1982): (P.226)

(5.28)  a. Because hei arrived late at the party, Pauli missed seeing Anna.
        b. After hisi recent election as Republican national chairman, Bill Brocki said…
        c. When shei was five year old, a child of my acquaintance i announced a theory that she
        was in habited by rabbits.

These examples are cases of what has been called ‘backward pronominalization’, as the pronoun precedes the first mention of the lexical NP in the discourse. Sentences with backward pronominalization involving non-argument pronouns may or may not involve a clause boundary, but those with a clause boundary are much easier to interpret, as one would expect. Unlike in (5.27b), which involves clause-internal backward pronominalization, in (5.28b) the pronoun is in a PP in the left-detached position, which is outside the clause, and coreference is the preferred interpretation. We must therefore revise (5.24) as follows. (P.227)

(5.29)  Principle governing intrasentential pronominalization (revised)

Coreference is possible between a lexical NP and a pronoun within the same sentence if and only if
a. the lexical NP is outside of the actual focus domain, and
b. if the pronoun is in a syntactic argument position and precedes the lexical NP, there is a clause boundary between the pronoun and the lexical NP.

What is important for our purposes here is that the two positions differ in terms of their coreference properties. Consider the following examples: (P.228)

(5.34)  a. In Sam’s hometown, hei is a big hero. LDP
a’. In hisi hometown, Sami is a big hero. LDP
b. * In Sam’s front hallway hei put a big vase. PrCS
b’. In hisi front hallway Sami put a big vase. PrCS
c. With Sami’s new job, hei’ll make a lot of money. LDP
 c’. * With Sami’s new boss hei has played golf many times. PrCS

An NP in the left-detached position can be interpreted as coreferential with a subject NP in the following clause, whereas an NP in the precore slot will obligatorily be interpreted as non-coreferential with the
subject NP in the following core. This is because an NP in the left-detached position must be outside the actual focus domain, whereas an NP in the precore slot in these constructions is focal. (P.229)

The principle of coreference in (5.29) states that a lexical NP must be outside of the actual focus domain for there to be coreference. Therefore the non-coreference reading of (5.34b, c’) is due to the fact that the lexical NP is focal and thus within the actual focus domain, violating the principle of coreference. Thus syntactic structure and focus structure interact to constrain the possible interpretation of coreference in sentence-internal pronominalization. (P.229)

5.7 Intersentential pronominalization

Most communication does not take place using single sentences, but the principle that the form of the representation of a referent is associated with a certain degree of cognitive accessibility (as summarized in figure 5.2) still holds in longer segments of speech, and this principle is used in determining intersentential coreference (discourse anaphora) as well. The major difference between intrasentential and intersentential pronominalization is that in texts there is often a greater distance between the first mention of a referent and its subsequent mention, and this distance can affect the form of the subsequent mention. The distance (in terms of clauses) between a referring element and the previous mention (including zero anaphors) of its referent is labeled referential distance in Givón (1983). A zero anaphor will normally have a very short referential distance, whereas overt elements, for example, a full pronoun or a definite lexical NP, will have greater referential distances. But other factors are involved as well; one of these is thematic continuity. (P.231)

A sequence of clauses with a single topic is known as a topic chain. In languages that use zero anaphora regularly, the topic being spoken about will often be only mentioned once, with the rest of the clauses consisting of only the focus of the assertion. See, for example, the following passage from Mandarin Chinese (adapted from Chen 1984: 8); the zero anaphors will be represented as ‘pro’.

(5.37) a. Lào Qián yǒu zhèméng gé qiānì,
     Old Qian have such CL disposition
     ‘Old Qian has (just) such a disposition:

b. pro wèn péngyǒu yào shénme dōngxi,
     ask friend want what/something thing
     if (he) asks for something from (his) friend(s),

c. pro liè jiù déi géi pro pro,
     at-once then must give
     (he/she/they) must give (it) (to him) at once;

d. pro bù déi géi pro pro
     not give
     if (he/she/they) don’t give (it) (to him),

e. pro jiù juéde pro shì qiáo-bù-qǐ tā,
     then feel COP look-down-on 3sg
     (he) feels that (he/she/they) don’t think much of him,

f. pro jī tiān bù gāoxìng
     several days not pleased
     (and) (he) would be displeased for a few days.’

Here we have a topic (Lao Qian) and a theme (Lao Qian’s disposition) introduced in the first clause. As the theme is the same for the rest of the clauses, and the main topic of the entire thematic paragraph remains the same, there is no need to use anything other than a zero anaphor to refer to LaoQian in most of the rest of the passage, even when a secondary topic (friend) appears in clause (b) and is the main topic of clause (e) and (d). (P.232)
A third factor affecting the representation of a particular referent is the appearance or not of other semantically compatible referents in the intervening clauses. (P.232)

5.8 Syntactic templates, linking and focus structure

Some syntactic patterns cooccur with specific focus structure patterns, e.g. narrow focus on the WH-word in the precore slot in a WH-question in English and many other languages, and this correlation would be represented in the template for WH-questions in the syntactic inventory. Many templates are not associated with a specific focus structure construction, and their entry in the syntactic lexicon could not contain any focus structure information. Thus, forming the constituent and focus structure projections for a WH-question in English would involve the combination depicted in figure 5.8 (see P.235), which is a revision of figure 2.35. We may, therefore, revise the basic linking example presented in chapter 4 (figure 4.10) to reflect this interaction between the lexicon and discourse pragmatics, as in figure 5.9 (P.236).

Figure 5.9 Linking from semantics to syntax in a simple English sentence

Figure 5.9 reflects only one aspect of the interaction, and we will see in the next chapter that these notions are also important for understanding the nature of grammatical relations cross-linguistically. (P.234)

Chapter 6 Grammatical relations

6.0 Introduction

6.1 Conceptions of grammatical relations

Traditional grammar assumes a particular set of relations based on grammatical phenomena in Indo-European languages: subject, direct object and indirect object. These notions appear to be central to many grammatical phenomena, and many of them apparently are describable in these terms. These notions also seem important for many non-Indo-European languages, because subjects and objects appear to be elements in their grammars. (P.242)
One of the central questions of linguistic theory is ‘how are languages different and how are they alike?’ Primitives (underived from anything else) and derived (from some other syntactic, semantic or pragmatic phenomenon or some combination thereof) are two grammatical relations. Grammatical relation cannot be both primitive and derived. (P.243)

6.1.1 Grammatical relations as primitives
The primitive terms are a part of the foundation of the theory and play a role in the formulation of the basic principles of the theory. As such, they form a crucial part of the explanatory basis of the theory. (P.243)

6.1.2 Grammatical relations as derived notions
If grammatical relations are derived, what are they derived from? The authors give an overview of two general approaches: (1) deriving grammatical relations from constituent structure configurations, and (2) deriving them from other notions. (P.243)

6.1.2.1 Configurational definitions of grammatical relations
In early transformational theory (Chomsky 1965), syntactic phrase structure was the accepted source for grammatical relations. While the configurational definition of grammatical relations did not require absolutely rigid word order, it did require that the verb and object be adjacent or at least not separated by non-VP elements. This restriction also encountered difficulties in languages with very free word order. (P.243-244)

6.1.2.2 Non-configurational definitions of grammatical relations
In this section the authors present definitions of subject and object suggested by some of the major syntactic theories. (P.245)
In FG (Dik 1978, 1980, 1989), different choices for subject and object are said represent different ‘perspective’ or ‘vantage points’ in the coding of a state of affairs. Subject is defined as ‘that constituent which refers to the entity which is taken as a point of departure for the presentation of the state of affairs in which it participates’ (Dik 1978: 87). Object choice (from among the semantic roles left over after subject assignment) represents a further specification of the perspective. The choice of what semantic roles can be specified as subject and object is governed by the hierarchy of semantic roles presented in (6.2) (Dik 1978: 76; cf. 1989: 226): (P.246)

(6.2) Semantic Function Hierarchy (SFH)

\[
\begin{array}{ccccccc}
\text{Agent} & \text{Goal} & \text{Recipient} & \text{beneficiary} & \text{Instrument} & \text{Location} & \text{Time} \\
\times & \times & \times & \times & \times & \times & \times \\
\text{Subject} & \times & \times & \times & \times & \times & \times \\
\text{Object} & \times & \times & \times & \times & \times & \times \\
\end{array}
\]

For Givón (1979a, 1984b, 1990). Subject and object are ‘grammaticalized pragmatic case roles’ (1984b: 138). Subject is the ‘primary clausal topic’ and object is the ‘secondary clausal topic’. There is a hierarchy for ranking the semantic roles according to the degree to which they are likely to be the subject or object of a simple active clause. This is called the ‘topic accession hierarchy’ or simply ‘topic hierarchy’ (1984b: 139). It is given in (6.3). (P.247)

(6.3) Agent >Dative/Benefactive >Patient >Locative >Instrument/Associative >Manner adverbs

In LFG, the assignment of grammatical relations is based on Lexical Mapping Theory (Bresnan and Kanerva 1989, Bresnan and Moshi 1990, Bresnan 1994). In this theory, grammatical relations are constituted of two primitive semantic features. One is the property of being restricted in terms of
semantic roles. Subject and object are seen as unrestricted [-r] in terms of what semantic roles can be associated with them; all other roles are restricted [+r] in this regard. This then gives a four-way contrast based on the two properties, differentiating the four types of grammatical relation recognized in this theory (Bresnan and Moshi 1990: 167). (P.248)

\[(6.4)\]

\[
\begin{array}{ccc}
[-r] & \text{SUBJ} & [+r] \\
[-o] & & [-o] \\
[-r] & \text{OBJ} & [+r] \\
[+o] & & [+o] \\
\end{array}
\]

Based on these properties, grammatical relations can be grouped into four natural classes, with SUBJ and OBJ being [-r], OBJ and OBJ\(\theta\) being [+o], OBJ\(\theta\) and OBL\(\theta\) being [+r], and SUBJ and OBL\(\theta\) being [-o]. (P.248)

Assignment of grammatical relations through assignment of these properties is obligatory and universal. It is based on the thematic role hierarchy given in (6.5). (P.248)

\[(6.5)\] agent > benefactive > goal > instrument > patient/theme > locative

### 6.2 The cross-linguistic diversity of grammatical relations

In this section the authors investigate several languages from the point view of the universality and comparability of grammatical relations. (P.250)

#### 6.2.1 Do all languages have grammatical relations?

The first crucial issue is how one could tell whether a given clause-internal syntagmatic relation is syntactic, semantic, or pragmatic. That is, how can one tell if the constructions are organized as subject-object, actor-undergoer or topic-comment? There are criteria for deciding this question, based on the properties of grammatical relations. (P.250)

Grammatical relations have two distinct and in principle independent types of properties, coding properties and behavioral properties. Coding properties refer to such things as case and the other morphological properties, such as verb agreement, and behavioral properties are those which define the role of the NP in grammatical constructions. (P.250)

An example of a coding property in English is verb agreement; it is illustrated in (6.8). (see 6.8, P. 250 ) Verb agreement in English is sensitive to the syntactic relation of subject and not to the semantic relation of actor or the pragmatic relation of topic. (P.252)

The same kind of arguments can be made with respect to behavioral properties (see (6.12) and (6.13)). (P.252)

All of the examples we have looked at so far have been from English, a dependent-marking language. The same phenomena are found in head-marking languages, but, because they are head-marking, these tests are concerned primarily with the presence or absence of the bound argument markers on the verb rather than the presence or absence of independent NPs. (see examples (6.15, from Enga, a Papuan language, P.253-254)

The authors use this type of behavioral test to determine whether or not grammatical relations are a significant part of the grammar of every language. An example of a language in which there are not restricted neutralizations of semantic roles is Acehnese, an Australian head-marking language (see (6.17), P.255). With respect to the coding property of verb cross-reference in Acehnese, there is no neutralization of semantic relations for syntactic purposes and hence no evidence for grammatical relations.

Acehnese has constructions like the English ones in (6.12) and (6.13), and they provide evidence regarding the behavioral properties tests for grammatical relations. The Acehnese equivalents of (6.12) are given in (6.21). (P.257)
As with verb agreement in Acehnese, there appears to be no neutralization of semantic relations for syntactic purposes and hence no evidence grammatical relations. (P.258)

Acehnese, like English, has a matrix-coding construction in which a semantic argument of the verb in the dependent core appears in the main core. The Acehnese equivalents of the English constructions in (6.13) are given in (6.23). (P.258)

Acehnese can be said to be a language in which there is no motivation for postulating syntactic relations: grammatical constructions can be accounted for with two notions, semantic roles and ‘semantic argument of the verb’, neither of which are grammatical relations. (P.260)

Archi, a Caucasian language, also appears to lack grammatical relations (see Kibrik 1979a, b), as do Classic Tibetan (Anderson 1987), Kannada and Manipuri (Bhat 1991). (P.260)

LaPolla (1990, 1993) argues that Mandarin Chinese also lacks grammatical relations, due to the non-existence of restricted neutralizations in the grammar, and that, in striking contrast to Acehnese, the relevant syntagmatic relations are pragmatic (topic-comment), rather than semantic (LaPolla 1995a). Mandarin does not have verb agreement or cross-referencing morphology, so we will look only at behavioral properties (see (6.24), (6.25), (6.26), (6.27), P. 260-262). No construction has been found in Mandarin that has such a restricted neutralization of semantic roles for syntactic purposes. The authors may conclude that not all languages have grammatical relations, in the sense of syntactic syntagmatic relations that are independent of semantic and pragmatic relations and play a role in the grammar of the language. Most languages do have grammatical relations in this sense, but that is not sufficient for grammatical relations like ‘subject’ to be considered universally valid. (P.263)

6.2.2 Are grammatical relations the same across languages?

Most languages have grammatical relations, and therefore it is reasonable to ask whether the grammatical relations they have are the same as the grammatical relations found in other languages. (P.263)

6.2.2.1 Subjects

In characterizing ergativity (Dixon 1972, Amdrews 1985), it is useful to distinguish S, the single argument of an intransitive verb, A, the actor of a transitive verb, and U, the undergoer of a transitive verb. Grammatical relations are constituted of combinations of the function. (P.263)

In English, the grammatical relation ‘subject’ includes both S and A, while the grammatical relation ‘direct object’ encompasses only U. This pattern (subject = [S, A], object = {U}) defines an Accusative pattern. The name comes from the case = marking pattern in languages like German and Russian in which S and A receive nominative case, while U receives accusative case (see examples (6.30), from Russian). (P.263)

In an ergative language, the grouping of functions is different, at least for some grammatical phenomena. With respect to case marking, S and U are assigned absolutive case, while A receives ergative case. Thus in an ergative language, case marking treats S and U alike and treats A differently (see examples (6.31), from Dyirbal). (P.264)

This contrast can be represented as in figure 6.2. The boxes indicate the functions which receive special morphological or syntactic treatment. Warpiri and Dyirbal are both ergative systems with respect to non-pronominal NP case marking. (P.263-264)
In English either actors or undergoer can be the subject of the transitive verb, but in Warlpiri, while actors and undergoers can both be the subjects of intransitives (which is not the case in Acehnese), only actors can be the subjects of transitives. This means that there are different neutralizations of semantic roles in these two languages. Therefore, the notions of subject are similar but not identical. There are restricted neutralizations in both languages, but the neutralizations are different. Virtually all of the languages with a restricted neutralization with transitive verbs have a voice construction. (P. 266) Dyirbal also has an ergative system of case marking (see (6.37)). Word order in Dyirbal is grammatically unconstrained (‘free’). Therefore case marking is sensitive to a grammatical relation rather than to the semantic relations of actor and undergoer. Following Dryer (1986), the authors refer to these grammatical relations as ‘absolutive’ and ‘ergative’, see table 6.1. (P.267)

Table 6.1  **Systems of grammatical relations**  

<table>
<thead>
<tr>
<th>Traditional grammatical relations</th>
<th>Ergative grammatical relations</th>
</tr>
</thead>
<tbody>
<tr>
<td>[S, A] Subject</td>
<td>d.n.a.</td>
</tr>
<tr>
<td>[S, U] d.n.a.</td>
<td>Absolutive</td>
</tr>
<tr>
<td>[U] Object</td>
<td>d.n.a.</td>
</tr>
<tr>
<td>[A] d.n.a.</td>
<td>Ergative</td>
</tr>
</tbody>
</table>

Table 6.2 could give the impression that grammatical relations in English and Dyirbal are very similar, and indeed there are certain important similarities. Both languages have a grammatical relation ‘subject’ and have a voice alternation (passive in English, antipassive in Dyirbal) which permits semantic arguments other than the default choice to be subject. However, the difference between them derives from the nature of the default subject choice: in English it is actor, whereas in Dyirbal it is undergoer. In terms of grammatical function, subject in English groups S and A together and U is treated differently (direct object); subject in Dyirbal encompasses S and U, and A is treated distinctly. The basic opposition in English is between subject (S, A, d-S) and direct object (U), whereas in Dyirbal it is between what we have been calling ‘absolutive’ (S, U, d-S) and ‘ergative’ (A). (P.269)

Table 6.2  **Restricted neutralization of semantic roles**  

<table>
<thead>
<tr>
<th>Intransitive Vs</th>
<th>Transitive Vs</th>
<th>Grammatical relations</th>
<th>‘subject’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acehnese</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>English</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Warlpiri, Enga</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Dyirbal</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

**6.2.2.2 Objects**

Dryer (1986) argues that in many languages the actual syntactic and morphological behavior of the causative NP is not (or is not always) that of the traditional direct object. He calls the PATIENT/RECIPIENT roles the ‘primary object’ (PO), and the PATIENT OR THEME of a ditransitive (in that system) a ‘secondary object’ (SO). (P.271-272)
Dryer sees the PO/SO distinction as a grammatical relation on a par with subject, direct object and other grammatical relations, and so the nature of a language (or more accurately, a construction) as of the PO type is independent of whether it is also of the ergative or accusative type, therefore a language (construction) can be ergative and PO, ergative and DO, accusative and PO, or accusative and DO. Dryer argues that the function of PO marking is to distinguish a more topical object from a less topical object, ‘thus the PO/SO distinction can be viewed as a grammaticalization of secondary topic vs. non-topic’. This parallels the subject/object distinction, which ‘can be viewed as the grammaticalization of “more topical” vs. “less topical”’. (P.272)

LaPolla (1992; see also LaPolla 1994) shows the prevalence of the PO type marking among Tibeto-Burman languages, but argues that it does not constitute a grammatical relation in all languages that manifest it, as it has no syntactic consequences such as the antidalative rule. He also argues that the development of the marking in the Tibeto-Burman languages he examined is based on a semantic actor vs. non-actor contrast, not on a pragmatic topical vs. non-topical object contrast. In most of the languages discussed by LaPolla, the PO marking appears only with animate or human participants, and only when necessary for disambiguation, for example, where the word order differs from the actor-recipient-theme order usual for those languages. One consequence of this view is that while both the dative/antidalative patterns and PO (anti-ergative) marking are influenced by certain pragmatic factors such as identifiability and the inherent lexical content of the NPs involved, they do not necessarily have the same motivations, and so should be considered separately in discussions of these phenomena. (P.272-273)

### 6.2.3 Summary

The cross-linguistic diversity of grammatical relations appears to be so great that it is extremely problematic to assume that the traditional Indo-European-based notion of ‘subject’ and ‘object’ are features of the grammars of all languages. In Acehnese there does not seem to be any evidence that there is a restricted neutralization of semantic roles for syntactic purposes. Thus the evidence from Acehnese suggests strongly that grammatical relations are not universal in the sense that they play a role in the grammar of every language. The data from Mandarin support this conclusion, albeit in a different way; Acehnese has both restrictions without neutralizations and neutralizations without restrictions, while Mandarin has only the latter. On this view, grammatical relations are universal but may differ from language to language. (P.273)

There is no neutralization of the actor and undergoer with a transitive verb in Warlpiri and Enga; there is neutralization of actor and undergoer only with intransitive verbs, whereas in English and Dyirbal there is neutralization of actor and undergoer with both transitive and intransitive verbs. (P. 273)

It appears that the traditional, Indo-European-based notions of ‘subject’ and ‘direct object’ will not stand up to the criterion of typological adequacy introduced in chapter 1, and it is needed to develop a rather different approach to dealing with grammatical relations cross-linguistically. (P.274)

### 6.3 A theory of grammatical relations

The authors present an alternative view of grammatical relations. Grammatical relations exist only where there is a restricted neutralization of semantic or pragmatic relations for syntactic purposes. In English and Enga, the controller is syntactic (because of the restricted neutralization), whereas in Acehnese it is semantic (because of the restriction without neutralization). (P.274)

In the Malagasy relative clauses in (6.26-6.27) there is a restricted neutralization as to which arguments can function as the head of the relative clause. This syntactic argument bears the privileged grammatical function in the construction. And we refer to it as the pivot of the construction. Since it is defined by a restricted neutralization of semantic roles for syntactic purposes, it is a syntactic pivot. Because there are no restricted neutralizations in the comparable constructions in Acehnese or Mandarin, these constructions do not have syntactic pivot. In the Acehnese constructions in (6.21) and (6.22) there is a privileged function, but it is semantic rather than syntactic. The authors refer to the actor in (6.21) and
the undergoer in (6.22) as the semantic pivot of each of these constructions, just as they are the semantic controllers of cross-reference in (6.176)–(6.20). (P.275)

If the restriction is purely semantic, as in Acehnese, then the pivot is a semantic pivot. If, on the other hand, the restriction also involves a neutralization of semantic roles, as in the constructions in English, Dyirbal, Enga, Malagasy and Warlpiri, then the pivot is a syntactic pivot. (P.275)

A very important feature of the concepts of controller and pivot is that they exist only with reference to specific morphosyntactic phenomena, and each grammatical phenomenon may define one controller and/or one pivot. If a language has agreement, then there will be a controller for agreement. If there is a restricted neutralization associated with agreement, then controller will be a semantic controller. (P.275)

What, then, is the ‘subject’ in traditional grammar? It first of all subsumes both controllers and pivots, and second of all, it assumes that the controller and/or pivot of each of the major grammatical phenomena in the language (or at least a majority of them) is the same. There are two immediate problems with the traditional notion of subject, in terms of this discussion. First, it is very important to distinguish syntactic controllers and syntactic pivots from semantic pivots, both cross-linguistically and within individual languages, and the traditional notion of subject does not make this distinction. Second, it crucially assumes that languages are consistent in their choice of syntactic controller and pivot across constructions. (P.278)

The authors summarize this discussion in table 6.3. It is important to realize that all of these phenomena (except ‘possessor raising’) have been attributed traditionally to subjects, and no candidate for a universally valid notion of subject emerges from this table. (P.278)

<table>
<thead>
<tr>
<th>Grammatical phenomenon</th>
<th>Controller or pivot</th>
<th>Syntactic or semantic</th>
<th>roles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acehnese cross-reference</td>
<td>Controller</td>
<td>Semantic</td>
<td>[A], [U]</td>
</tr>
<tr>
<td>Acehnese ‘want’ construction</td>
<td>Both</td>
<td>Controller = semantic</td>
<td>[A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pivot = semantic</td>
<td>[A]</td>
</tr>
<tr>
<td>Acehnese ‘possessor raising’</td>
<td>Pivot</td>
<td>Semantic</td>
<td>[U]</td>
</tr>
<tr>
<td>Dyirbal purposive construction</td>
<td>Both</td>
<td>Both syntactic</td>
<td>[S, U, d-S]</td>
</tr>
<tr>
<td>Dyirbal coordinate construction</td>
<td>Both</td>
<td>Both syntactic</td>
<td>[S, U, d-S]</td>
</tr>
<tr>
<td>Enga cross-reference</td>
<td>Controller</td>
<td>Syntactic</td>
<td>[S, A]</td>
</tr>
<tr>
<td>Enga ‘want’ construction</td>
<td>Both</td>
<td>Controller = semantic</td>
<td>[A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pivot = syntactic</td>
<td>[S, A]</td>
</tr>
<tr>
<td>English verb agreement</td>
<td>Controller</td>
<td>Syntactic</td>
<td>[S, A, d-S]</td>
</tr>
<tr>
<td>English matrix-coding construction</td>
<td>Pivot</td>
<td>Syntactic</td>
<td>[S, A, d-S]</td>
</tr>
<tr>
<td>English <em>want</em> construction</td>
<td>Both</td>
<td>Controller = semantic</td>
<td>[A]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pivot = syntactic</td>
<td>[S, A, d-S]</td>
</tr>
<tr>
<td>Malagasy relativization</td>
<td>Pivot</td>
<td>Syntactic</td>
<td>[S, A, d-S]</td>
</tr>
<tr>
<td>Warlpiri-<em>kurra</em> construction</td>
<td>Pivot</td>
<td>Syntactic</td>
<td>[S, A]</td>
</tr>
</tbody>
</table>
Syntactic controllers and pivots are grammatical phenomena. Prototype theory (as it applies to grammatical analysis) involves semantic universals, such as lexical categories (e.g. color terms) and semantic relation categories (e.g. transitivity). Prototypes are applicable to all languages. Syntactic pivot as a grammatical relation does not reflect any semantic prototype, unlike actor and undergoer, but is simply the grammaticalization of usage patterns that commonly have the actor and topic, or undergoer and topic, being represented by the same NP. (P.280)

In order to distinguish this type of restricted neutralization from the type found in Dyirbal, English, Sama and Malagasy, the authors refer to the Warlpiri/Enga-type [S, A] pivots and controllers as **invariable syntactic pivots** and **invariable syntactic controllers**. Because there is in principle a choice of actor or undergoer to function as pivot or controller with transitive verbs in Dyirbal, English, Sama and Malagasy, the authors refer to the pivots and controllers defined by the [S, A, d-S] and [S, U, d-S] neutralizations as **variable syntactic pivots** and **variable syntactic controllers**. They summarize the fact from all of the languages we have looked at in table 6.4. Syntactic controllers defined by the same restricted neutralizations would likewise be variable or invariable, just like the syntactic pivots in the table. (P.281)

**Table 6.4 restricted neutralizations and pivot types**

<table>
<thead>
<tr>
<th>Language</th>
<th>Restricted neutralization</th>
<th>Pivot type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achenese</td>
<td>None</td>
<td>Semantic pivot</td>
</tr>
<tr>
<td>Dyirbal</td>
<td>[S, U, d-S]</td>
<td>Variable syntactic pivot</td>
</tr>
<tr>
<td>Enga</td>
<td>[S, A]</td>
<td>Invariable syntactic pivot</td>
</tr>
<tr>
<td>English</td>
<td>[S, A, d-S]</td>
<td>Variable syntactic pivot</td>
</tr>
<tr>
<td>Malagasy</td>
<td>[S, A, d-S]</td>
<td>Variable syntactic pivot</td>
</tr>
<tr>
<td>Sama</td>
<td>[S, U, d-S]</td>
<td>Variable syntactic pivot</td>
</tr>
<tr>
<td>Warlpiri</td>
<td>[S, A]</td>
<td>Invariable syntactic pivot</td>
</tr>
</tbody>
</table>

Syntactic controllers and pivots are the privileged syntactic arguments in grammatical constructions, and henceforth when the authors mean both of them, they use **privileged syntactic arguments** as a cover term for them. In section 4.5 the authors reinterpreted the Actor-Undergoer-Hierarchy in figure 4.2 as a unidirectional hierarchy with ‘argument of DO’ (i.e. AGENT) as the highest-ranked argument and ‘argument of pred’ (x)’ (i.e. PATIENT) as the lowest-ranked argument; the hierarchy in (4.51) is repeated in (6.51). (P.281)

(6.51) *Privileged syntactic argument selection hierarchy*

arg. of Do >1st arg. of do’ >1st arg. of pred’ (x, y) > 2nd arg. of pred’ (x, y) > arg. of pred’ (x)

If a verb takes actor and undergoer arguments, the actor will outrank the undergoer in terms of this hierarchy, since the actor will always code a higher argument than the undergoer, following the Actor-Undergoer-Hierarchy. The basic selection principles for syntactically accusative constructions syntactically ergative constructions are given in (6.52). (P. 282)

(6.52) *Privileged syntactic argument selection principles*

a. Syntactically accusative constructions: highest-ranking macrorole is default choice.

b. Syntactically ergative constructions: lowest-ranking macroroles is default choice

As mentioned above, there is no need for any grammatical relations aside from the notions of controller and pivot. All phenomena traditionally dealt with by the concept ‘direct object’, such as dative shift,
applicative constructions and passives, can be handled by the concepts undergoer and core argument. (P.285)

6.4 Discourse reference-tracking mechanisms and voice
One of the things which speakers and hearers must do is keep track of introduced referents in discourse, and syntactic pivots may play a central role in the grammatical means languages make available for this purpose. There are a number of different grammatical means which can serve this function, and some of them crucially involve syntactic pivot. (P.285)

6.4.1 Reference-tracking system
Tzutuji text in (6.54, see P.283-284), the primary topical participant, the thief, functions as the syntactic pivot in each of the clauses in which it occurs, as 6.55, see P.284) makes clear. This structure is sometimes called a ‘topic chain’. This type of reference tracking is called switch-function; the term originally proposed in Foley and Van Valin (1984). This system tracks one primary participant which is always realized as the syntactic pivot, and the verbal system indicates its semantic role: a change in voice indicates a change in semantic function. The most important feature of these systems for this discussion is that, given a transitive verb with an actor and an undergoer, the choice of which one will function as syntactic pivot can be influenced by discourse-pragmatic factors; that is, in topic chains in languages like Tzutujil, Dyirbal, Tepehua and English, the primary topical participant is chosen as pivot, and ‘primary topical participant’ is clearly a discourse-pragmatic notion of the type. (P.287)

An alternative reference-tracking system is switch-reference. Switch-reference is found mainly in verb-final languages, taking the form of a morpheme at the end of a clause which signals whether the subject of the next clause is the same referent as the subject of that clause. (P.287)

Switch-reference is tracking a function and signaling whether the referent in that function is the same as the referent in that function in the following clause or not. (P.288)

Switch-reference and switch-function are not the only means languages employ for keeping track of referents in discourse. Another system involves increasing the number of possible distinct referring expression, i.e. of making multiple distinctions among third-person referring expressions. (P.288)

In switch-function languages, there is often a gender system which is normally used for non-pivot coreference; this is the case in English. So, the way in which we keep track of non-pivot NPs is by gender, while pivots may be tracked with zero anaphora. (P.289)

6.4.2 Pragmatic pivots
All switch-function systems have variable syntactic pivots. Virtually all switch-reference systems, on the other hand, have invariable syntactic pivots. (P.290)

Variable syntactic pivots in switch-function systems correspond to what have been called pragmatic pivots in RRG. A pragmatic pivot is a variable syntactic pivot in which the selection of the argument to function as pivot of a transitive verb is not predictable from its semantic role and may be influenced by discourse-pragmatic considerations, in particular the topicality and activation status of its referent. The pivots in topic chains in (6.54) from Tzutujil, (6.56) from Dyirbal and English, and (6.57) from Tepehua are all pragmatic pivots. The prototypical subject in English is a pragmatic pivot, an actor-pivot in a predicate-focus construction; the prototypical ‘subject’ in Dyirbal is also a pragmatic pivot. The choice of argument to serve as a variable syntactic controller can also be influenced by discourse-pragmatic considerations, e.g. the pragmatic pivot in a clause in a topic chain is the controller of the pragmatic pivot in the next clause. Hence there are ‘pragmatic controllers’ as well, but in RRG the term ‘pragmatic pivot’ has been used to refer to both variable syntactic pivots and controllers of this type. The notion of pragmatic pivot is useful for a couple of reasons. First, it ties focus structure into the linking between syntax and semantics in some constructions in some languages. That is, it is a grammatical relation which explicitly recognizes the intimate involvement of pragmatics in some grammatical systems.
Second, because not all languages have pragmatic pivots, they are useful concept in language typology. The grammatical systems of languages which have constructions with pragmatic pivots look very different from those of languages which lack pragmatic pivots altogether. Acehnese, Enga and Warlpiri all lack constructions with pragmatic pivots, since they have only invariable syntactic pivots or semantic pivots. On the other hand, English, Dyirbal, Tepehua and Tzutujil, along with Malagasy and Sama, all have constructions with pragmatic pivots, and these constructions are among the most salient ones in their grammar. (P.291-292)

The authors compare the role of different pivot types in Dyirbal, Sama (Walton 1986) and English in table 6.6. Of the three languages with pragmatic pivots, they are much more important in the grammar of Dyirbal and Sama than they are in English, as they are a feature of more major constructions in those languages than in English. (P.293)

Table 6.6 Role of pivot and controller types in different languages

<table>
<thead>
<tr>
<th>Construction</th>
<th>Dyirbal</th>
<th>Sama</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>WH-question</td>
<td>Pivotless</td>
<td>PrP</td>
<td>Pivotless</td>
</tr>
<tr>
<td>Relativization</td>
<td>PrP</td>
<td>PrP</td>
<td>Finite: pivotless</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Participle: VSP</td>
</tr>
<tr>
<td>Topicalization</td>
<td>d.n.a.</td>
<td>PrP</td>
<td>Pivotless</td>
</tr>
<tr>
<td>Topic chaining</td>
<td>PrP</td>
<td>PrP</td>
<td>PrP (optional)</td>
</tr>
<tr>
<td>Imperative</td>
<td>SmC</td>
<td>SmC</td>
<td>ISC</td>
</tr>
<tr>
<td>Reflexivization</td>
<td>d.n.a. (cf. section 7.5.1)</td>
<td>SmC</td>
<td>SmC (preferred)</td>
</tr>
</tbody>
</table>

Hence pragmatic pivots play a more important role in the grammar of some languages because they are part of constructions which are the only option speakers have to express a particular semantic content. (P.294)

6.4.3 Types of voice constructions

In the prototypical instances of both passive and antipassive constructions, there are two distinct facets to the constructions. First, an argument which would not be selected as the privileged syntactic argument by the principles in (6.52) is selected as that argument; in a passive construction, it means that an argument lower on the hierarchy in (6.51) than the default choice is selected, while in an antipassive construction, it means that an argument higher on the hierarchy in (6.51) than the default choice is selected. Second, the argument that would be the default choice in terms of (6.52) either does not appears at all in the clause or appears as an oblique element of some kind; in this oblique status it no longer functions as a controller or pivot. (P.294)

While these two features of voice alternations cooccur in the prototypical constructions, they are logically independent of each other, and, as we shall see, they do not always occur together. The authors, therefore, give each a separate label and description. The first will be called the privileged syntactic argument (PSA) modulation voice, since it specifically deals with allowing a non-default argument to function as syntactic pivot or controller. The second will be called the argument modulation voice, since it involves the non-canonical status of a status of a macrorole argument. We can now break down the English passive and the Dyirbal -NAp antipassive into their component parts, as in (6.62). (P.295)

(6.62) a. English passive construction

1 PSA modulation: non-actor occurs as pivot/controller (default non-actor = undergoer).
2 Argument modulation: actor appears in periphery as object of by or is omitted.
b Dyirbal -NAψ antipassive construction

1 PSA modulation: actor appears as syntactic pivot/controller.
2 Argument modulation: undergoer appears in dative or instrumental case.

There are many languages in which the voice constructions do not match these prototype, and there are many instances in which a construction instantiates only one of the two facets of the prototypical passive or antipassive. The clearest example of how independent these two parts of the passive are comes from passives of intransitive verbs, which are found in a variety of languages, e.g. Icelandic, German, Latin and Turkish (Comrie 1977, Keenan 1985a). (P.295)

Roberts (1995) proposes that passive morphology serves to signal the suppression of the actor as a core argument and that it is associated with argument modulation passive only. The data (6.63, see P. 295) from Icelandic and the Ute and Sama passives in (6.69, see P.298) and (6.70, see P. 299) are purely argument modulation voice constructions, and they are all have passive morphology, whereas the Lango construction in (6.64, see P. 295-296) involves PSA modulation only and lacks passive morphology. (P.299)

Antipassive constructions instantiate pivot modulation and argument modulation voices separately. In discussing the use of the antipassive as opposed to the plain tense form (where case marking is the same as in simple sentences), Nichols (1982: 455) notes that ‘the subject of the antipassive is more thematic than that of the plain tense, and consequently the antipassive is favored in chain-final or paragraph-final position or as an independent utterance’. There is no modulation of the undergoer in this construction, as it is still in the nominative case and controls verb agreement. (P.300)

A given language may have different structures for the two types of antipassive. Jakaltek has three different antipassive forms, one for pivot modulation, two for argument modulation. In the pivot modulation antipassive, there is no ergative agreement marker on the verb and the suffix –n(i) appears affixed to the verb. This construction is used when an actor argument is questioned, clefted or serves as the head of a relative clause (see table 6.5). In one of the two Jakaltek argument modulation antipassives, the verb takes the antipassive marker –w-, no ergative marker appears on the verb, and the controller of the absolutive agreement is the actor, not the undergoer, which appears as an oblique (see examples (6.73) from Datz 1980). (P.301)

In these argument modulation antipassives the actor does become the potential pivot and controller in the clause, due to its being the only remaining direct macrorole argument. (P.301-302)

In conclusion, the authors have shown that the prototypical voice construction, be it a passive or an antipassive, is actually an amalgam of two distinct, more basic voice constructions, which the authors have labeled ‘PSA modulation voice’ and ‘argument modulation voice’ construction. Each of them may be given a general characterization as in (6.77). (P.302)

(6.77) General characterization of basic voice constructions

a. PSA modulation voice: permits an argument other than the default argument in terms of (6.52) to function as the privileged syntactic argument.

b. Argument modulation voice: gives non-canonical realization to a macrorole argument.

6.5 Some typological issues

In the authors’ discussion of grammatical relations in this chapter, they have argued that syntactic relations exist only when there is a restricted neutralization of semantic roles for syntactic purposes. We have seen examples of three patterns of restricted neutralizations: [S, A], [S, A, d-S] and [S, U, d-S] (see tables 6.2 and 6.3). There is, however, a fourth possible pattern of neutralization, namely [S, U]. These patterns raise a number of important questions. First, why do only three of the four seem to occur? Are there any instances of [S, U]? Second, which are the most frequent patterns and why? Third, are there any asymmetries in the distribution of the three types? That is, do they all cooccur equally in grammatical systems? (P.303)
[S, U] neutralizations do exist, although true neutralizations of this kind are rare, and they are often difficult to distinguish from undergoer-only restrictions. An example of this neutralization can be found in the distribution of the partitive (‘zerik’) case in Basque (see examples (6.78), Levin 1989, P 303). Another example of this kind of pivot can be seen in Belhare, a Tibeto-Burman language of Nepal (see examples (6.79), from Bickel 1996, P.304).

The two questions about the distribution of the types of neutralizations are distinct but closely related to each other. The most common restricted neutralization pattern cross-linguistically appears to be the [S, A] pattern. Virtually all languages have at least one construction which works with this pattern (Acehnese and Mandarin being obvious exception), and there are many languages in which this is only pattern found, e.g. Enga, Kewa, Fore and many other Papuan languages, Choctaw, Cree, Zapotec, Sanuma and many other languages of North and South America, Mparntwe Arrernte, Warlpiri and many Australian languages. The next most common pattern is the [S, A d-S] pattern of familiar accusative languages like English, Russian, German and Spanish, as well as Malagasy, Lango, Quechua and Tepehua. No language has only variable syntactic pivots and controllers; some phenomena, e.g. addressee of imperatives, have normally either invariable [S, A] controllers or semantic (actor) controllers. The controller of ‘want’ constructions and related constructions are always semantic controllers, and the controllers in coordinate constructions like those in (6.42), (6.56) and (6.57) are always variable syntactic controllers. The least common of the three most frequent patterns is the ergative syntactic pattern, [S, U, d-S]. It is found in a relatively small number of languages and is never the exclusive pivot or controller type. (P.304-305)

There is one more question: not only are [S, U] neutralizations rare, but there are no languages which have them exclusively, in stark contrast to the frequent monopoly of [S, A]. Why should these distributional patterns hold? Part of the answer lies in the importance of agency and animacy in language. Dixon (1979, 1994) argues that the only universally valid notion of subject is [S, A], and this stems from the fact that certain universal grammatical phenomena, e.g. forming imperative, causative constructions and control of reflexivization, involve AGENT-like arguments primarily rather than PATIENT-like arguments. It has also long been noted by many observers that language users typically pay more attention to animate referents than to inanimate referents and talk about them more. This is reflected, for example, in the inherent lexical content hierarchy proposed in Silverstein (1976, 19810 (see (7.54)), which has the speech act participants and other humans at the top and inanimate and abstract entities at the bottom. These two sets of observations are not independent of each other, as AGENT-like arguments are normally animate or human, while PATIENT-like arguments may, but need not, be animate or human. The authors represent this in (6.80). (P.305)

(6.80) Privileged syntactic argument selection hierarchy

arg. of Do > 1st arg. of do > 1st arg. of pred’ (x, y) > 2nd arg. of pred’ (x, y) > arg. of pred’ (x)

OBLIGATORY ANIMATE > VERY LIKELY ANIMATE > NEED NOT BEE ANIMATE

‘Arg. of DO’ is always animate, and the ‘1st arg. of do’’, especially if it is an instigator, is almost always animate; it is non-instigator EFFECTORS which are inanimate (see section 3.2.3.2). Many of the classes of state pred’ (x, y) verbs require the first argument to be animate, but none requires the second argument to be animate. Finally, there is no requirement on the single arguments of pred’ (x) verbs that they be animate. (P.306)

The importance of animate and AGENT-like arguments is a significant factor favoring [S, A] neutralizations. The wide occurrence of [S, A, d-S] and [S, U, d-S] neutralizations, however, suggests that here must be another factor at work which can override the animacy and agentiveness factors; the most obvious candidate for this second factor is discourse pragmatics. PSA modulation antipassive constructions allow actors of transitive verbs to function as the privileged syntactic argument in syntactically ergative constructions, and this why [S, U,d-S] neutralizations are so much more common than [S, U] neutralizations. Moreover, this neutralizations is most commonly found in so-called
‘extraction’ constructions, i.e. topicalization, relativization and WH-question formation, all of which have pragmatic conditions on their occurrence (see section 9.5). (P.306-307)

We now have four interacting factors involved in these neutralization patterns: topic, focus, animacy and agentivity. Topic, animacy and agentivity cohere in [S, A] and [S, A d-S] patterns, and, not surprisingly, these are the most common cross-linguistically. Focus, animacy and agentivity coalesce in the [S, U, d-S] pattern; in particular, the ‘d-S’ component is a reflection of the importance of agentivity. Of these four factors only focus would seem to motivate the [S, U] pattern; there is, however, a semantic parameter potentially relevant here, namely affectedness. The asymmetry between them stems from the fact that keeping track of referents in discourse is a more complex and demanding task than introducing new referents, and accordingly languages have typically devoted more grammatical machinery to the former task than to the latter. All a language needs for introducing new referents is a way of indicating focus, which they all have; some, but not all, have a special presentational construction for this purpose as well. Thus, it would appear that topic outranks focus as a factor, and this leads to the predominance of [S, A, d-S] over [S, U d-S] patterns. (P.307-308)

Chapter 8 Syntactic structure, II: complex sentences and noun phrases

8.0 Introduction
In this chapter the authors investigate the issue of syntactic structure of complex sentences and complex NPs. (P.441)

8.1 Theoretical issues
There are two fundamental questions that every theory must answer about complex sentences, they Are given in (8.1). (P.441)

(8.1) a. What are the units involved in complex sentence constructions?
    b. What are the relationships among the units in the constructions?

A great deal of controversy has surrounded the question of units in contemporary syntactic theory. In GB, all units in complex sentences contain a subject-predicate structure; the theory does not recognize any subclausal units in complex constructions. In GPSG, HPSG, ConG and LFG, on the other hand, both clausal and subclausal (VP) units are posited in complex sentences. In the authors’ approach, the answer to (8.1a) is derived from the layered structure of the clause: the fundamental building blocks of complex sentences are the nucleus, core and clause. The traditional answer to (8.1b), the question about the structural relationships among units in a complex sentence, is summarized as follows: (P.441)

Complex sentences are divided into: (a) those in which the constituent clauses are grammatically co-ordinate, no one being dependent on the others, but all being...added together in sequence, with or without the so-called coordinating conjunctions...(John talked to Mary, and they went to the store, and...); and (b) those in which one of the clauses (‘the main clause’) is ‘modified’ by one or more subordinate clauses grammatically dependent upon it and generally introduced...by a subordinating conjunction. Subordinate clauses are subdivided by function as nominal, adjectival, adverbial, etc.; and further as temporal, conditional, relative, etc. (Lyons 1968: 178, emphasis in original) (P.441)

The various types of subordinate clauses in clued sentential ‘subject’ and ‘object’, e.g. That it is raining comes as no surprise (clause as ‘subject’) and Max regretted that he had insulted Susan (clause as ‘object’), and clauses used as sentential modifiers, e.g. Sally talked to Bill after the got home from work. The theory of the units will henceforth be referred to as the theory of juncture and the theory of relations as the theory of nexus, following RRG. (P.441-4420)
### 8.2 Levels of Juncture

All theories agree that the clause is a possible unit in complex sentence formation. Where they differ, however, is in how to characterize the subcultural units. As stated above, the authors take the units in complex constructions to be those of the layered structure of the clause: nucleus, core and clause. In complex constructions, the following patterns emerge. (P.442)

\[(8.2)\]

- a. \([\text{CORE} \ldots \text{[NUC PRED]} \ldots + \ldots \text{[NUC PRED]}]\) Nuclear juncture
- b. \([\text{CLAUS} \ldots \text{[CORE} \ldots \text{]} \ldots + \ldots \text{[CORE} \ldots \text{]} \ldots \text{]}\) Core juncture
- c. \([\text{SENTENCE} \ldots \text{[CLAUSE} \ldots \text{]} \ldots + \ldots \text{[CLAUSE} \ldots \text{]} \ldots \text{]}\) Clausal juncture

The unmarked linkage paradigm is for units of the same level to combine, i.e. nucleus with nucleus, core with core, and clause with clause. There is one striking instance of a marked, asymmetric linkage, clause with core. (P.442)

**Nuclear juncture** involve a single core containing multiple nuclei, this is illustrated with examples from French, English and Mandarin in (8.3). (P.442)

\[(8.3)\]

- a. je fer-ai mang-er les gâteaux à jean
  
  1st make-3sgFUT eat-INT the.Mpl cakes Dat John
  
  ‘I will make John eat the cakes.’
- b. John forced open the door.
- b’. John forced open the door.
- c. Tā qiāo pō le yī gè fānwnān.
  
  3sg hit break PRFV on CL bowl
  
  ‘He broke (by hitting) a ricebowl.’

The constituent projections for the sentences in (8.3) are given in Figure 8.1. In both cases, the two nuclei make up a complex nucleus which takes a single set of arguments in the core (see P.57).

The abstract schema for core junctures is given in (8.2b). Here we have a single clause made up of multiple cores, and each core may itself be internally complex, i.e. may contain a nuclear juncture. Examples of core junctures from French, English and Mandarin are in (8.5). (P.444)

\[(8.5)\]

- a. je laisser-ai Jean mang-er les gâteaux.
  
  1st let-1sgFUT John eat-INF the.Mpl cakes
  
  ‘I will let John eat the cakes.’
- b. I ordered Fred to force the door open.
- c. John forced the door to open.
- d. Tā jiāo wǒ xiě zì.
  
  3sg teach 1sg write characters
  
  ‘She teaches me to write characters.’

The structures for these examples are given in figure 8.2. Note that the second core in English sentences is itself complex, as it contains a nuclear juncture of the type discussed above. There are clear structural differences between the nuclear and core junctures in figure 8.1 and 8.2. (P.444)

The structural differences between English core and nuclear junctures are reflected in several ways. First, core junctures may require a complementizer, in this case to (see section 8.4.2), whereas nuclear junctures do not permit one. This can be seen most clearly when the second nucleus is a verb (see examples (8.7), P.445)

Second, the two nuclei may be adjacent in some nuclear junctures, e.g. (8.3b) or Mary pushed open the windows, whereas this is impossible with a core juncture, as (8.8) shows. (P.445)

\[(8.8)\]

- a. *John forced to open the door. (< John forced the door open)
b.*Sam persuaded to leave sally. (< Sam persuaded Sally to leave)

Figure 8.1 Nuclear junctures in French, English and Mandarin
English nuclear junctures are much more limited than those in French and Mandarin. In particular, nuclear junctures are only possible in English if the predicate in the second nucleus is intransitive, i.e. is a verb, adjective or preposition taking a single argument. (P.446)

The schema in (8.2c) is for clausal juncture. The sentence in (8.12) contains all three juncture types. (P.447)

(8.12) Mary called Fred yesterday, and she asked him to paint her room white.

The whole sentence is a clausal juncture, a single sentence made up of two clauses, *Mary called Fred yesterday* and *she asked him to paint her room white*. The second clause contains a core juncture, *she asked him to paint her room white*, and the second core in the second clause contains a nuclear juncture, paint her room white. The structure of this sentence is given in Figure 8.4. (P.448)
To recap the juncture types, nuclear junctures are single cores containing more than one nucleus, and multiple nuclei function as a single complex predicate taking a single set of core arguments. In a core juncture, on the other hand, there is a single clause containing more than one core. Each core may have its own core argument(s) not shared with the other core(s). In a clausal juncture, whole clauses are joined, and each clause may be fully independent of the others. (P.448)

8.3 Nexus relations

The traditional contrast between subordination and coordination seems to be very clear cut for languages like English and its Indo-European brethren, but when one looks farther afield, constructions appear which do not lend themselves to this neat division. Papuan languages from Papua New Guinea, such as Chuave (Thurman 1975) and For (Scott 1978), present constructions which seem to have aspects of both nexus types (see examples (8.13) and (8.14). (P.448-449)

In Chauve and Fore languages the non-final clauses lack the expression of a crucial and obligatory grammatical category. Every independent utterance in Chuave and Fore ends with an illocutionary force morpheme; they cannot be an independent utterance without it. (P.449)

A further example of this three-way contrast can be found in Amele, another Papuan language (Roberts 1988). Roberts contrasts switch-reference constructions with coordinate and subordinate constructions. The basic Amele switch-reference construction is given in (8.17). (P.449)

(8.17) a. Ija hu-m-ig sab j-ig-a.
   1sg come-SP-1sg food eat-1sg-TPAST
   ‘I came and ate the food.’
   b. Ija ho-co-min sab ja-g-a.
   1sg come-DFP-1sg food eat-2sg-TPAST
   ‘I came and you ate the food.’

Like the Chauve, Fore and Kewa switch-reference constructions, the linked clause depends upon the final clause for the expression of an obligatory grammatical category (operator), in this case tense. Despite their coordinate translations, there is evidence against analyzing them as coordinate: unlike coordinate constructions, tense, mood (illocutionary force) and negation can be shared across conjuncts in the switch-reference constructions (see examples (8.18)-(8.20). (P.450-451)
Amele has three types of true subordinate clauses: complement clauses with verbs of cognition and saying, relative clauses, and adverbial clauses. The switch-reference constructions cannot be analyzed as complement clauses and relative clauses: they are clearly not relative clauses (they are not nominal modifiers), and they are not arguments, either syntactic or semantic, of the matrix verb; in addition, switch-reference marking is not found on complement or relative clauses. Hence the only possible analysis of them as subordinate is to classify them as adverbial clauses, and Roberts presents a number of arguments against this analysis, two of which will be presented here. First, it is possible for subordinate clauses to be postposed after the matrix clause; this is not possible with switch-reference or coordinate constructions (see examples (8.22-8.24), P. 452-453). Switch-reference constructions behave like coordinate constructions, not subordinate constructions, with respect to the possibility of occurring after the matrix clause. Second, a pronoun in an initial adverbial subordinate clause can be coreferential with a full NP in the subsequence matrix clause, but this is impossible in switch-reference and coordinate constructions. (P.453)

Looking at the switch-reference constructions, it seems clear that the clauses are ‘added together in sequence’ and that the linked clauses are neither modifiers nor arguments of the final clause. On the other hand, they share with subordinate structures the important property of being dependent, albeit in a different way; switch-reference constructions exhibit operator dependence, e.g. shared tense and illocutionary force, whereas subordinate constructions are structurally dependent, i.e. they cannot occur independently, even though they may appear to be fully inflected for the obligatory operators. (P.454)

The nexus type of the switch-reference constructions will be called cosubordination, following Olson (1981). The three nexus types are summarized in figure 8.5. Subordination subsumes two distinct construction types: units functioning as core argument (e.g. ‘subject’ and ‘object’ complement clauses), on the one hand, and modifiers (e.g. relative clauses, adverbial clauses), on the other. (P.454)

![Figure 8.5 Nexus types](image)

### 8.4 The interaction of nexus and juncture

All three nexus types are possible at all three levels of juncture, and consequently there are nine possible juncture-nexus types in universal grammar. A language need not have all nine, and in fact most do not; for example, English exhibits seven juncture-nexus types, Nootka (Wakashan; North America) has six (Jacobsen 1993), and Korean appears to have all nine (Yang 1994). It is important to keep in mind that these juncture-nexus types are abstract linkage relations, not grammatical construction types; each juncture-nexus type may be realized by more than one grammatical construction type in a language. The juncture-nexus types found in English and some of their formal instantiations are given in (8.26). (P.455)

(8.26) **English juncture-nexus combinations**

a. Max made the woman leave. 
  Vince wiped the table clean.  
  Nuclear cosubordination
b. Ted tried to open the door.
  Sam sat playing the guitar.
  Core cosubordination
c. David regretted Amy’s losing the race.
  That Amy lost the race shocked everyone.
  Core subordination
d. Louisa told Bob to close the window. Core coordination
   Fred saw Harry leave the room.
e. Harry ran down the hall laughing loudly. Clausal cosubordination
   Paul drove to the store and bought some beer.
f. John persuaded Leon that Amy had lost. Clausal subordination
   Bill went to the party after he talked to Mary.
g. Anna read for a few minutes, and she went out. Clausal coordination

8.4.1 Operators in complex sentences

The distinguishing feature of cosubordination is operator dependence, i.e. obligatory sharing of operators across the units in the juncture. In a nuclear juncture, the relevant operators are (nuclear) directional, (nuclear) negation and aspect; in a core juncture, they are modality, (core) directional, internal negation; and in a clausal juncture, they are any of the clausal operators, most often tense and illocutionary force. All operators above the level of juncture are shared equally by all units, i.e. in a core juncture, all cores are equally within the scope the tense and illocutionary force operators. All operators below the level of juncture are free, subject to their compatibility with the sentences of the predicate; for example, if the nucleus in one of the cores in a core juncture contained a stative verb, it would not be able to take progressive aspect, a nuclear operator, not because of the restrictions imposed by the juncture-nexus type but because of the incompatibility of progressive aspect with stative verbs. The authors illustrate this with the contrast between nuclear and core junctures in Mandarin. In (8.3a), repeated below in (8.27a), the postverbal perfective aspect marker le occurs after both verbs and has scope over both. It cannot occur between them, as shown in (b), and the two verbs cannot have distinct aspect operators, as (c) shows. The full representation of (8.27) with operator and constituent projections is given in figure 8.6 (P.456)

```
<table>
<thead>
<tr>
<th>SENTENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLAUSE</td>
</tr>
<tr>
<td>CORE</td>
</tr>
<tr>
<td>ARG</td>
</tr>
<tr>
<td>NUC</td>
</tr>
<tr>
<td>ARG</td>
</tr>
<tr>
<td>NUC</td>
</tr>
<tr>
<td>NUC</td>
</tr>
<tr>
<td>NUC</td>
</tr>
<tr>
<td>NUC</td>
</tr>
<tr>
<td>PRED</td>
</tr>
<tr>
<td>PRED</td>
</tr>
<tr>
<td>NP</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>NP</td>
</tr>
</tbody>
</table>
| Tā qiāo pò le yīge fān wān
| V        |
| V        |
| NUC      |
| NUC      |
| NUC      |
| ←ASP     |
| CORE     |
| CLAUSE   |
| SENTENCE |
```
Figure 8.6 Operator sharing in Mandarin nuclear juncture

(8.27)  
a. Tā qiāo pò le yī ge fānwān
   3sg hit break PRFV one CL bowl
   ‘he broke (by hitting) a ricebowl.’
b. *Tā qiāo le pò yī ge fānwān.
c. * Tā zhēngzhāi qiāo pò le yī ge fānwān.
   1sg PROG hit break PRFV one CL bowl
   ‘* He is hitting broke a ricebowl.’

Operators in nuclear junctures are illustrated with the following pair of sentences from Barai (Olson 1981). (P.457-458)

(8.29)  
a. Fu kāi fu-one kume-fie va.
   3sg friend 3sg-GEN call-listen continue
   ‘He continued calling and listening for his friend.’
b. Fu vazai ufu furi numu akoe.
   3sg grass cut finish pile throw.away
   ‘He finished cutting, pled and threw away the grass.’

In the above (a) is an example of nuclear cosubordination and (b) one of nuclear coordination. The structure of these sentences is presented in Figure 8.7 (see P. 458).

The contrast in operator projections in the two non-subordinate nexus types in core junctures is illustrated in the English examples in (8.30) and figure 8.8). (P.459)

Further examples of same-pivot core coordinate constructions can be found in Turkish. Watters (1993) shows that the same-pivot constructions in (8.31) have distinct types due to the different interpretations of the scope of the core operators -mEll- ‘ought’ and –Ebil- ‘able’ in them. This difference is attributable to the different properties of the complementizers. (P.460)

(8.31)  
a. Gid-ip gör-meli-yiz.                                   Core cosubordination
   go-CMPL see-MODAL-1pl
   ‘We ought to go and see.’
b. müzik dinle-yerek, uyu-yabil-ir-im               Core coordination
   music listen-CMPL sleep-MODAL-AOR-1sg
   ‘Listening to music, I can sleep.’

Both core share the same privileged syntactic argument in each example; the operator projection represents the fact that the modal operator has scope over both cores in (8.31a) but not in (b). Thus, it is the scope of the core-level operators that is crucial for distinguishing the two non-subordinate nexus types. The structures of these two sentences are presented in Figure 8.9 (see, P.461).

Clausal junctures occur in all languages, and clausal coordination is unquestionably a universal juncture-nexus type. In clausal coordination, each clause is completely independent of the other in terms of operators, even to the point of having distinct illocutionary force, if need be (see examples (8.37). (P.463)

Operators play a crucial role in distinguishing cosubordination from coordination at all levels of juncture, but they play no role at all in determining levels of juncture, which are defined purely structurally. In a nuclear juncture, multiple predicates or nuclei constitute what is in effect a single complex predicate with a single set of arguments. In non-subordinate core junctures, the cores must share a core argument; as shown in section 8.3 and depicted in Figure 8.2, one of the core arguments functions as a semantic argument in each core, in that it occurs syntactically in one core but is interpreted as a semantic argument of the linked core. In subordinate core junctures, the linked unit functions syntactically as an
argument of the nucleus in the matrix core. In clausal junctures, the core and peripheral constituents of the two clauses are independent, there is no argument sharing between the clauses. (P.468)

8.4.2 The status of complementizers

It is clear that languages have a category of what the authors call clause-linkage markers which serve to express important aspects of the syntax and semantics of complex constructions. The elements which serve this function may be drawn from a variety of morphosyntactic categories, e.g. adpositions (as in English), determiners (e.g. the Lakhota complementizer ki, which is also the definite article), case markers (as in Mparntwe Arrernte; Wilkins 1989) and bound elements like the linking suffixes found in Nootka and the Papuan languages discussed above. Hence the authors gloss these elements ‘CLM’ for ‘clause-linkage marker’ rather than ‘CMPL’ for ‘complementizer’, to reflect their more general functional class. The clause-linkage markers that are used in particular constructions are in part a function of the level of juncture; in English, for example, to and from mark only linked core, where that marks only clausal units. (P.476)

The distribution of these markers across juncture-nexus types follows an interesting pattern: nuclear junctures lack them altogether, there is usually a restricted number of them in core junctures in a language, and the greatest elaboration of them occurs in clausal junctures. The reason for this distribution is two-fold. First, languages simply have the largest number of constructions instantiating clausal juncture, fewer at the core level and very restricted number at the nuclear level. Second, as we will see in the next section, the possible semantic relations among the units in a nuclear juncture are very restricted; in languages that have nuclear junctures, there is usually only one kind of construction at this level of juncture, namely a causative construction. Hence no markers are necessary. At the core level, the semantics of the construction are to a considerable extent a function of the semantics of the matrix verb, and therefore there are only a few semantic contrasts independent of the matrix verb to be coded, primarily, as we have seen, with respect to temporal sequencing. Finally, at the clausal level, the widest range of semantic relations between the units can be expressed, and since the units are largely independent of each other in terms of their semantic content, the burden of expressing the semantic relations among them falls on the clause-linkage markers (P.477)

8.4.3 The Interclausal Relations Hierarchy

The nine possible juncture-nexus types may be organized into a hierarchy in which they are ranked in terms of the tightness of the syntactic link or bond between them. The resulting hierarchy will be termed the ‘Interclausal Syntactic Relations Hierarchy’ and is presented in figure 8.16. The linkage types at the top of the Interclausal Syntactic Relations Hierarchy all involve integrating the components of the juncture into a single subclausal or clausal unit, e.g. the nuclei in a nuclear juncture make up a single core with a single set of core arguments, and the core in a core juncture are part of a single clause. (P.477-478)

Nuclearcosubordination
Nuclear subordination
Nuclear coordination
Core cosubordination
Core subordination
Core coordination
Clausal cosubordination
Clausal subordination
Clausal coordination

Strongest: Tinghest integration into a single unit

Weakest: Least integration into a single unit

Figure 8.16 Interclausal Syntactic Relation Hierarchy
The Interclausal Syntactic Relations Hierarchy thus make it possible to make predictions about the form of the linked unit in a particular juncture-nexus type, given an account of the operators in a language. (P.478)

The juncture-nexus types of the Interclausal Syntactic Relations Hierarchy are purely syntactic, but they are used to express a wide variety of semantic relations between the units in the construction. As first argued by Silverstein (1976) and Givón (1980), such semantic relations themselves can be ranked in a continuum based on the degree of semantic cohesion between or among the units in the linkage, i.e. the extent to which a given construction expresses facets of a single event, action or state of affairs or discrete events, actions or states of affairs. A list of some these relations is given (8.55). (P.478-479)

(8.55) **Interclausal semantic relations**

a. **Causative**: the bring about of one state of affairs directly by another state of affairs, usually an event or action, e.g. (8.3a), (8.26a).

b. **Aspectual**: a separate verb describes a facet of the temporal envelope of a state of affairs, specially its onset, its termination or its continuation, e.g. start, finish, etc.

c. **Psych-action**: a mental disposition regarding a possible action on the part of a participant in the state of affairs, e.g. decide, forget, want, etc.

d. **Puposive**: one action is done with the intent of realizing another state of affairs.

e. **Jussive**: the expression of a command, request or demand, e.g. (8.30b).

f. **Direct perception**: an unmediated apprehension of some act, event or situation through the senses, e.g. see, hear, etc.

g. **Propositional attitude**: the expression of a participant’s attitude, judgment or opinion regarding a state of affairs, e.g. believe, consider, etc.

h. **Cognition**: an expression of knowledge or mental activity, e.g. know, think about, etc.

i. **Indirect discourse**: an expression of reported speech, e.g. say, etc.

j. **Conditional**: an expression of what consequence would hold, given the conditions in a particular state of affairs, e.g. if, etc.

k. **Simultaneous states of affairs**: one state of affairs is temporally coterminous with another, e.g. while, the same as, etc.

l. **Sequential states of affairs**:

1. Overlapping: one state of affairs partially overlaps with another, e.g. before, etc.

2. Non-overlapping: one state of affairs begins immediately after another one end, e.g. as soon as, etc.

3. Non-overlapping, with an interval: there is a temporal interval between the end of one state of affairs and the beginning of the next, e.g. after, etc.

m. **Temporally unordered states of affairs**: the temporal relation between states of affairs is unexpressed.

This list should not be taken as complete; rather, it represents major distinctions along a semantic continuum, much the same way the thematic relations discussed in chapter 3 fall along a semantic continuum, and more distinctions are possible. These semantic relation can be ranked in a hierarchy in terms of how closely related the propositions in the linkage are (the notion of ‘semantic cohesion’ mentioned above). This hierarchy will be termed the Interclausal Semantic Relations Hierarchy, and it is given in figure 8.17. (P.480)
Silverstein (1976) and Givón (1980) also argue that there is a fundamentally iconic relationship between the syntax and semantics of clause linkage: the closer the semantic relationship between two proposition is, the stronger the syntactic link joining them is. That is, the closeness of the semantic relationship between the units in a juncture is mirrored in the tightness of the syntactic relationship between them. This can be seen most clearly when we juxtapose the Interclausal Syntactic relations and the Interclausal Semantic Relations Hierarchies to create the Interclausal Relations Hierarchy in Figure 8.18. (P.480-481)

All languages can express the semantic relations in the Interclausal Semantic Relations Hierarchy part of the Interclausal Relations Hierarchy, and there are fewer juncture-nexus types in the Interclausal Syntactic Relations Hierarchy than distinct semantic relations in the Interclausal Semantic Relations Hierarchy; hence a language invariably has fewer syntactic juncture-nexus types than there are semantic
relations that need to be expressed. Consequently the mapping between the two sides of the Interclausal Relations Hierarchy is many-to-one. (P.480-481)

8.5 Focus structure in complex sentences

There is a very general structural principle governing the potential focus domain in complex sentences, which was originally proposed in Van Valin (1993b); it is stated in (8.61). (P.485)

(8.61) The potential focus domain in complex sentences

A subordinate clause may be within the potential focus domain if it is a direct daughter of (a direct daughter of ...) the clause node which is modified by the illocutionary force operator.

In principle there is no limit to the number of direct daughters involved, and therefore the specification in parentheses should be considered to be recursive. In terms of cross-linguistic variation, there appear to be only two possibilities: the potential focus domain is restricted to main clause only, in which case (8.61) is irrelevant to the language, or the potential focus domain can extend to the deepest subordinate clause in any sentence, as long as the condition in (8.61) is met. There appear to be no languages that arbitrarily limit the potential focus domain to a specific depth of embedding; that is, languages with a restriction like ‘only two clauses down and no more’ do not exist. (P.485)

In figure 8.14 (see, P. 467) the subordinate clause, a that-clause, is a direct daughter of the clause modified by the illocutionary force operator; this can be seen most clearly in the operator projection, even though it is presented in both projections. Hence it is within the potential focus domain. In Figure 8.20 the authors replace the operator projection by the focus structure projection to depict this. As in the figures in chapter 5, the dotted line represents the potential focus domain, and the ‘ARG’, ‘NUC’, etc. indicate the basic information units. (P.485)
Figure 8.20  Potential focus domain in clausal subordination (*that*-complement)

Figure 8.13 (see, P.466) involves an adverbial subordinate clause. The subordinate clause is not a direct daughter of the clause node modified by the illocutionary force operator; it is, rather, an adjunct modifier of the core. Hence the potential focus domain does not extend into the subordinate clause, but the clause as a whole is within the potential focus domain, as it is a constituent of the periphery of the main clause. This is illustrated in figure 8.21 (P.487).

Another type of evidence involves the distribution of focus-sensitive elements. For example, if a language has overt focus particles marking NPs in focus, then their distribution in embedded clauses would be a telling indicator of whether the potential focus domain extends into embedded clauses. If they can occur in a particular type of embedded clause with their focus-marking function, that is evidence that that clause type is within the potential focus domain (see examples from Lakhota, P. 8.64-8.67).

The potential focus domain in these Lakhota constructions is summarized in (8.69) and the simplified representations of these constructions in figure 8.22 (see, P.491)

---

8.6  The structure of complex noun phrases

In this section the authors discuss NPs which have clauses and infinitives as constituents. (P.492)

8.6.1  Juncture and nexus in complex NPs

NPs and sentences have similar but not identical layered structures and this comes out most clearly in complex constructions. There are four layers in sentential units (sentence, clause, core and nucleus), whereas there are only three in NPs (NP, coreN, nucleusN). Hence the NP level is the analog to the clause
level of juncture, and there are three distinct linkage types at the NP level which correspond to nexus differences in complex sentences. Each constituent NP can have the full range of operators and arguments, e.g. *The two tall sisters of my neighbor and the two short brothers of my best friends are going out together.* This will be referred to as NP coordination. (P.492)

It is possible to link two NPs which share a determiner, an NP level operator, but have all other operators independently, e.g. *The three green cars and two red cars were sold in an hour.* This is an example of NP cosubordination. It is possible to have a subordinate modifier at the NP level, a restrictive relative clause, e.g. *the two red cars which were sold yesterday.* The structure of the first two types of linkage is presented in figure 8.23 (P.493) and 8.24 (P.494).

There are at least two types of coreN linkage. The first involves *that*-clauses serving as the coreN argument of nouns like *story, rumor, belief, opinion*, etc. The structure of coreN subordination is given in figure 8.25 (P.495). The other includes infinitive complements to nouns like attempt, order, request, and promise, etc. Consequently there appears to be only one type of non-subordinate linkage at the coreN level, and therefore we will posit coreN subordination and coreN cosubordination within complex NPs. The structure of coreN cosubordination is illustrated in figure 8.26 (P.494).

![Figure 8.23 English NP coordination](image-url)
English has productive syntactic noun compounding constructions, which would be a nuclear N juncture. An example of this would be the N + hunter pattern (which is itself an instance of the more general N + V-er pattern), as in duck hunter, lion hunter, deer hunter, etc. The resulting compound nominal takes a single set of operators, all of which have scope over both components of the complex nucleus, e.g. the two tall duck hunters, those three Dutch deer hunters, etc. There appears to be only one nexus type at the nuclear level; in both the English and the Lakhota constructions, all operators would have scope over the derived nucleus, including all nuclear operators. The structure of these nuclear junctures is given in figure 8.27 (P.497).

It appears that while there are juncture-nexus distinctions among complex NP constructions, they have a different distribution from that in complex sentence constructions. That is, while all three nexus types are possible at both the clausal and NP levels of juncture, only two nexus types are found at the core level, subordination and cosubordination, and there appear to be no nexus contrasts at all at the nuclear level. This is summarized in table 8.1 (P.497)

<table>
<thead>
<tr>
<th>Level of juncture</th>
<th>Nexus type(s)</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP</td>
<td>Coordinate</td>
<td>Figure 8.23</td>
</tr>
<tr>
<td></td>
<td>Cosubordinate</td>
<td>Figure 8.24</td>
</tr>
<tr>
<td></td>
<td>Subordinate</td>
<td>Restrictive relative clause</td>
</tr>
</tbody>
</table>

Figure 8.24 English NP cosubordination

Figure 8.27 English nuclear N juncture

Table 8.1 Juncture and nexus in the NP
8.6.2 Relative clauses

The prime example of NP subordination is restrictive relative clauses. In such a construction, a clause is used as a restrictive modifier of an NP; it is part of the periphery of the NP, since it is an optional modifier, not a core argument. (P.497)

In the constructions with relative pronouns, the relative pronouns occur in the precore slot. The structures of English and German examples are given in figure 8.28 (P.499) and 8.29 (P.500). These structures are analogous to those of clausal subordination with adverbial clauses (see figure 8.13); in both cases a clause is used as a modifier of matrix unit. Hence clausal subordination involving adverbial clauses is structurally parallel to NP subordination involving restrictive relative clauses. (P.498)
8.6.3 Headless relative clauses and WH-complements

The final type of complex construction to be discussed is not really a type of complex NP, but it is nevertheless very similar to relative clauses; hence it is necessary to have talked about relative clauses before examining it. The constructions in question are exemplified in (8.73). (P.503)

(8.73)  a. I can’t remember who Jose saw.  
          b. What Mary bought is a mystery to me.  
          c. Robin could not identify who had talked to Kim at the party to the police.

The italicized clause in (a) – (c) have the same structure as the relative clause in figure 8.28, but they are not nominal modifiers, as there is no head noun. Hence they are usually referred to as headless relative clauses. The relative pronoun who is located in the precore slot, because first, in the non-subject headless relatives in (8.73a, b), the WH-word is clearly in that position, and second, in other constructions involving WH-words in English it occurs the precore slot. Hence the authors posit a uniform position for the WH-element in all of these constructions. As in literally headed relative clauses, the WH-head of the relative is coindexed with the NP dominated by the ARG node in the matrix core. Finally, there are pure WH-complements, which in English are marked by the complementizer whether, as in Robin doesn’t know whether Pat will arrive or not. The structure of sentences with whether-complements is basically the same as the structure for that-complements in figure 8.14. It typically occurs with interrogative complements and in place of that, which does not occur with this type of complement clause. Like that, whether will be considered the clause-linkage marker for this type of subordination. (P.503-504)
8.7 Syntactic templates for complex sentences

Clausal subordination involving ‘object complements’ (e.g. *that*-clauses), as in figure 8.14, would require a specific template which is given 8.34 (P.506).

The structure of (8.37c) is given in figure 8.33 (P.504)

Nuclear subordination, as exemplified in figure 8.7, also requires a specific template, given in figure 8.35. There are two important criterial features of this template. The first is that the modified nucleus
(NUC1) is always dominated by a core node. The second important point is that the modifying nucleus, NUC2, does not predicate and therefore does not dominate a PRED node (see 8.4.1). (P. 506)

![Diagram of nuclear subordination]

There are general templates for coordination and cosubordination, independent of the level of juncture. They are given in figure 8.36. The essential difference between the two templates is that in coordination the linked units are daughters of a node of the next-highest layer of the clause, whereas in cosubordination they are daughters of a node of the same layer of the clause. (P.507)

![Diagram of coordination and cosubordination]

There are two templates in figure 8.36 can be combined in a single complex construction. Examples of this are given in (8.75). (P.507)

(8.75)  a. Sandy tried to persuade Kim to visit Robin.
       b. Pat asked Robin to try to visit Kim.

*ask or persuade + infinitive* realizes core coordination. The structures of these two sentences are given in figure 8.37
Figure 8.37a Syntactic structure of (8.75a)

[Diagram of syntactic structure with nodes labeled for core, clause, sentence, argued from left to right and top to bottom.]

Sandy tried to persuade Kim to visit Robin.
Finally, there is a general template for externally headed relative clause; it is given in figure 8.38. The linear order is irrelevant; the periphery and therewith the relative clause could be prehead as well. The clause node can be filled out with clause templates containing a precore slot, as in English WH-relative, or lacking one, as in the Malagsy, Jakaltek and English *that*-relative. (P.507)