Chapter 1

Introduction

1.1 Preliminaries

Case may be defined as a dependent morpheme attached to a NP which represents its relation to the verb which it is an argument of (Blake 1994). The study of case has a lot of aspects, morphological, syntactic, semantic, and pragmatic. This is responsible for a variety of approaches to case and case marking. What is most intriguing about the study of case is that it requires researchers to make explicit a set of assumptions about how different components of grammar, in particular semantics and syntax, are associated and how each component, in particular semantics of major lexical categories, is organized. This is so, since irregular case frames are often exhibited by a set of constructions, e.g. psych verb, subject-to-object/subject-to-subject raising, possessor raising, and light verb constructions, which, as will be shown in Chapters 4-6, display complex associations between semantics and syntax which themselves require thorough investigation.[1]

The purpose of this work is twofold: to provide a general framework for the typological study of case systems; and to present an in-depth study of Korean, Japanese, Icelandic, and Imbabura Quechua case systems. These case systems have presented a challenge to multistratal frameworks, e.g. **Government and Binding Theory** [**GB**] (Chomsky 1981, 1986), **Relational Grammar** [**RelG**] (Perlmutter 1983, Perlmutter and Rosen 1984). A major concern in this work is the extent to which lexico-semantic information provided by verbs accounts for both the typological variation of case systems, accusative, (split-)ergative, and active systems, and a set of irregular case frames displayed by a variety of constructions in those four languages mentioned above and, to a lesser extent, how to organize lexical information provided by verbs in such a way as to make correct predictions about their case frames.

1.2 The Organization of Lexical Information

The basic claim of this work is that cases are not associated with structural positions or grammatical relations, but with lexical information provided by predicates. The framework proposed here incorporates the essential features of **Role and Reference Grammar** [**RRG**] (Van Valin 1993, Van Valin and LaPolla in press), a version of parallel structure grammar with a multi-tiered lexical representation (cf. Bresnan 1994, Mohanan 1990, Sadock 1991), but it involves a number of crucial departures from RRG as presented in Van Valin (1993) and Van Valin and LaPolla (in press).

RRG assumes that the lexical representation of a predicate consists of two tiers of semantic roles: thematic relations and macroroles. The thematic relation tier consists of a decompositional representation of verb meaning à la Dowty (1979), while the macrorole tier carries generalized semantic roles. What sets RRG apart from other parallel structure grammars, e.g. **Lexical-Functional Grammar** [**LFG**] (Bresnan 1982a), **Autolexical Theory** [**AT**] (Sadock 1991, Schiller et al. 1996), is that RRG posits an independent level for generalized semantic roles, termed macroroles, which have no exact counterpart in other theories.[2] RRG regards the association between thematic relations and macroroles as lexical and puts operations which change the linking between macroroles and grammatical relations, e.g. passivization, outside the lexicon (see Ch.2). (1) describes how lexical (as opposed to syntactic) information is organized in RRG:

(1)

	Grammatical Relations
Syntax	
	Macroroles
Lexicon	
	Thematic Relations

I will provide a full account of the RRG linking system in Chapter 2. The primary question to be investigated in this work is the extent to which lexical information, i.e. the association between thematic relations and macroroles, licenses case assignment.

1.3 Typology of Case Systems: Parametrization and Constraint Ranking

The traditional way of reconciling the typological diversity of language and the concept of universal grammar within the framework of GB is to appeal to the concept of **parameter**. The basic scheme behind parametrization is given in (2):

(2) Process of Language Acquisition

	UG:	Grammar:
Primary linguistic data ---------->	Principles and unset parameters ---------->	Principles and set parameters

Children are assumed to set parameters after they are exposed to primary linguistic data. This approach has been applied to the domain of case assignment as well. For example, consider (3), a proposal made by Bobaljik (1992, 1993) (see Marantz 1991 and Murasugi 1992 for similar lines of inquiry) to attribute the distinction between accusative and ergative case systems to a single parameter (cf. Levin and Massam 1984):

(3) Case X is obligatorily assigned/checked.

Obligatory Case Parameter [**OCP**]

a. In nominative-accusative languages, CASE X is NOMINATIVE (=ERG)
b. In ergative-absolutive languages, CASE X is ABSOLUTIVE (=ACC).

Glossing over the issue of how to assign these obligatory and other Cases, we may make a few observations about (2). First, it seems to be necessary to propose another parameter in addition to OCP for active case systems, which mark subjects differently, depending on the semantic properties of a verb (see Merlan 1985, Mithun 1991, and O'Connor 1992, among others).[3] Second, it is not obvious how Bobaljik (1992, 1993) may extend his proposal (3) to account for split-ergative case systems. This may turn out to be a serious problem, since most ergative languages display a split of some sort (see Comrie 1981a, Dixon 1994, Silverstein 1976, and Tsunoda 1981).

Legendre et al. (1993) may be taken as a response to the above criticism. They solve the first problem by adopting **Optimality Theory** [**OT**] (Prince and Smolensky 1993), a constraint-based formalism with an emphasis on constraint interaction that derives

the typological variation from ranking of a set of universal constraints as in (4a)-(4h) (Legendre et al. 1993: 466):

(4) a. Agents [=A]receive abstract case C_1.
b. Patients [=P] receive abstract case C_2.
c. Agents do not receive abstract case C_2.
d. Patients do not receive abstract case C_1.
e. Core arguments (agents and patients) do not receive abstract case C_4.[4]
f. Some argument is case-marked C_2.
g. High-prominence arguments receive abstract case C_1.
h. Low-prominence arguments are not core case-marked (C_1 or C_2)

Legendre et al. assume three abstract cases: C_1, C_2, and C_4 and that in all languages, C_1 and C_2 are the abstract cases respectively assigned to A and P for a simple transitive input AP. They make the same assumption as Bobaljik (1992, 1993) that in any given language, C_1 and C_2 are realized through whatever surface forms are used to refer to agent and patient NPs in a transitive clauses.[5] C_4 in (4e) is a cover term for all oblique cases including dative, locative, ablative, and instrumental case.[6]

They propose to define three major case systems, accusative, ergative, and active, in terms of the relative ranking of (4a)-(4h), as shown by (5a)-(5c):

(5) a. Accusative: **(4g)** > (4h) > (4f) > (4c) > **(4a)** > **(4d)** > (4b) > (4e)
b. Ergative: (4h) > (4f) > **(4g)** > (4c) > **(4a)** > **(4d)** > (4b) > (4e)
c. Active: **(4a)** > **(4d)** > **(4g)** > (4h) > (4f) > (4c) > (4b) > (4e)

The three constraints, (4a), (4d), and (4g), which undergo re-ranking, are put in boldface in (5). Like Bobaljik (1992, 1993), Legendre et al. (1993) claim that the case marking patterns of transitive clauses remain constant in any language and that there is a typological variation only in intransitive clauses. (5a) assigns nominative case to intransitive subjects, since (4g) tops the constraint hierarchy. If the constraint (4g), which tops the constraint hierarchy (4a), is ranked a bit lower, and all other rankings remain constant, we will get the ergative case system. Finally, if we modify (5a) by moving the constraints (4a) and (4f) to the top of the hierarchy, we will get active case systems.

There are four potential problems with (4). First, (4a)-(4e) apply to agents and patients alone. As Paul Smolensky noted (personal communication), it remains to be

investigated how to accommodate the other thematic relations, i.e. theme, locative, and especially experiencer, which exhibits irregular case marking patterns crosslinguistically. Second, they do not show how to handle dative-subject constructions (see Verma and Mohanan 1990), which are attested in many languages including Kannada, Tamil, Hindi, Icelandic, Japanese, Korean, Russian, Warlpiri, and Georgian.[7] Furthermore, it is not clear how to provide a principled account of oblique cases other than dative case, e.g. instrumental, ablative, allative, and locative case, within Legendre et al.'s (1993) framework, since they group all oblique cases under the rubric of C_4. Third, it is not immediately obvious how (4a)-(4h) may be extended to handle irregular case frames exhibited by psych verb and a variety of raising and complex predicate constructions. Especially challenging are those case frames with more than one nominative or accusative case which abound in East Asian languages such as Japanese and Korean. Finally, the constraint system given in (4) might lead to an explosion in the number of possible case systems, since there are, logically speaking, 40320 (=8!) possible rankings of the eight constraints (4a)-(4h). There may not be so many possible rankings, since not all of these constraints are in conflict, but it remains to be seen how to restrict the range of possible case systems.[8]

The bulk of this work is devoted to solving all of these four problems by supplying the enriched lexical representations of verbs developed within the framework of RRG to the OT computational system.

1.4 Overview

The present study takes the following course of progress. Chapter 2 provides a brief introduction to OT and RRG. Chapter 3 has three goals: to propose a set of universal constraints for core cases, i.e. nominative, accusative, ergative, and dative; to demonstrate that one may derive all the major case systems from re-ranking the proposed constraints; and to provide a principled account of instrumental and comitative case in English,

Japanese, Korean, and Russian. It is shown in Chapter 3 that it is possible to restrict the range of possible case systems by appealing to functional factors which are external to the constraint system. These two chapters form a backdrop against which the set of irregular case frames in Korean, Japanese, Icelandic, and Imbabura Quechua will be analyzed in Chapters 4-6.

Chapter 4 applies the constraint set to case frames displayed by Japanese psych verbs. It is shown that a variety of case frames displayed by psych verb constructions in Japanese arise from the way thematic relations are associated with macroroles. Chapter 5 provides an account of what has been described as "case spreading" and "case stacking" in Korean, Japanese, Icelandic, and Imbabura Quechua. It is proposed that it is necessary to relax the requirement made by the previous RRG literature that there should be a one-to-one correspondence between thematic relations and macroroles. Chapter 6 investigates a variety of constructions in Korean and Icelandic, subject-to-subject/subject-to-object raising, possessor raising, and light verb constructions, all of which have been lumped together under the rubric of "raising/ascension" in the GB and RelG literature. It is proposed that a verb may involve more than one LS if and only if one is entailed by the other. These two proposals in Chapters 5 and 6 involve crucial departures from RRG as presented in Van Valin (1993) and Van Valin and LaPolla (in press), which impose a biuniqueness constraint on the association between macroroles and thematic relations, according to which each macrorole, actor or undergoer, may be associated with only one thematic relation.

To sum up, Chapters 4-6 show that a rich lexical representation of verb semantics available is crucial for describing and explaining the set of irregular case frames in Korean, Japanese, Icelandic, and Imbabura Quechua. Chapter 7 concludes the work.

Notes

1. This means that any case theory should be couched within a particular theory of linking between semantics and syntax; no separate theory of case is required (cf. Pollard and Sag 1994: Ch.1).

2. See Alsina (1993) and Zaenen (1993), however, both of whom adapt Dowty's (1991) proto-role account into LFG. Alsina's version of protorole is particularly close to the RRG macrorole, since both participate in the linking between lexical semantics and syntax and both are discrete, in sharp contrast to Dowty's original formulation (cf. Ackerman and Moore 1994, Filip 1995). See also Davis (1996) in this connection.

3. See Bittner and Hale (1996) for an attempt to assimilate active case systems to either accusative or ergative case systems. I leave an examination of their proposal to another occasion.

4. Although it is not clear to me why there is no C_3 in (4a)-(4h), I follow Legendre et al.'s (1993) numbering.

5. For example, Woolford (1995) treats the Palauan case and agreement system as a manifestation of a single constraint hierarchy with a re-ranking triggered by aspectual (i.e. perfective vs. imperfective) information. I must leave it as an open question whether one may collapse a case and agreement system as a single system or not (see Smith 1992 in this connection).

6. I do not consider the validity of (4g) and (4h) here, whose main function is to trigger passivization.

7. Paul Smolensky (personal communication) suggested to me a possibility of explaining dative case on subject NPs licensed by inverse verbs within Dowty's (1991) framework. It is not clear to me, however, how a set of entailments assumed by Dowty contribute to explaining the dative case assignment on the subject NP.

8. Legendre et al. (1993) go on to combine a typology of case systems with that of voice systems, which I have nothing specific to say about in this work. I leave an evaluation of their attempt for further research.

Chapter 2

The Theoretical Framework

2.1 Introduction

The main framework which will be adopted in this thesis is **Optimality Theory** [**OT**] (Prince and Smolensky 1993), a constraint-based formalism with an emphasis on constraint interaction. OT grew out of connectionism (Legendre et al. 1990, Smolensky 1994), but it abstracts away from a connectionist substrate: the relative strengths of constraints are encoded in ordinal terms.[1] OT has wide applications to a variety of areas of linguistics that include phonology (McCarthy and Prince 1993), syntax (Grimshaw 1993, Pesetsky 1995b, Woolford 1995), and acquisition (Demuth 1995, Smolensky 1996).

OT is applied to the domain of case marking in this thesis. An input to an Optimality-based grammar of case marking is supplied by the two-tiered system of semantic roles developed within **Role and Reference Grammar** [**RRG**] (Van Valin 1993, Van Valin and LaPolla in press). RRG is a version of parallel structure grammar (cf. Bresnan 1994, Mohanan 1990, Sadock 1991) that posits three parallel constraining components, syntax, lexical semantics, and information structure, and thus contrasts with **Government and Binding Theory** [**GB**] (Chomsky 1981, 1986) and **Relational Grammar** [**RelG**] (Perlmutter 1983, Perlmutter and Rosen 1984), which assume more than one syntactic representation and operations, e.g. **move alpha** (GB), **relation-changing rules** (RelG), which link those multistratal representations.

This chapter is organized as follows. Section 2.2 introduces the overall architecture of OT. Section 2.3 is devoted to outlining the RRG view of syntax, lexical semantics, and their linking. A particular focus is placed on its two-tiered semantic structure, the thematic relation tier and the macrorole tier, whose combination serves as an input to an OT grammar of case, and on how syntax and semantics are linked in complex sentences, in

particular control and subject-to-object raising and subject-to-subject raising constructions. Section 2.4 provides a summary of this chapter.

2.2 Optimality Theory

OT is a constraint-based formalism which has so far been applied mainly, if not exclusively, to generative phonology and syntax, but it is neutral with respect to the nature of linguistic theories or problem domains which it is applied to. OT shifts the explanatory burden of a linguistic theory from input-based rewrite rules to output-based constraints and views a grammar as a function which maps each linguistic input (e.g. an underlying phonological string) to its correct structural description (e.g. a prosodic parse; see Prince and Smolensky 1993).

OT assumes that grammar consists of the following three components:

(1) a. **Con**: The universal set of constraints out of which grammars are constructed.

b. **Gen**: A function which defines, for each possible input, the range of candidate linguistic analyses available to the input.

c. **Eval**: A function that comparatively evaluates sets of linguistic forms with respect to a given constraint hierarchy.

OT assumes that Gen always provides a correct output. (2) describes the way input-output pairings are accomplished with these components. Suppose that we have a grammar X, a particular ranking of Con, and an input in_i:

(2) Schema for An Optimality-Based Grammar
Gen $(in_i) = \{cand_1, cand_2, cand_3, \ldots\}$
Eval (X, $\{cand_1, cand_2, cand_3, \ldots\}$) ----> $cand_k$ (the output, given in_i)

This grammar associates input in_i with output $cand_k$.

The essential idea behind Con is that a set of constraints at work in a particular language are universal and may make contrary claims about the well-formedness of most representations. This entails that all constraints in OT are, in principle, violable. This view is in sharp contrast to the more common view (see Shieber 1986 and Pollard and Sag 1994) that constraints in grammar are mutually consistent.[2]

The function Gen contains information about representational primitives and their most basic modes of combination. Gen produces a possibly infinite set of candidate analyses which are consistent with a given input by freely exercising the basic structural resources, e.g. free ranking of Con. OT emphasizes the role of constraint interaction, which will be explained and illustrated below, and downplays the role of Gen, assuming that it does what is necessary under the circumstance.

The candidate analyses are tested against Eval, a system of ranked constraints with the following six properties. First, constraints are non-graded. The relative strengths of constraints are quantified in ordinal terms. Thus, OT is in contrast to **Variable Rule Model** [**VRM**] (Guy 1991, Labov 1969; see also Guy 1995 and Sells et al. 1995 for their comparison), in which constraints are quantified in probabilistic terms. Second, a grammar resolves conflicts among constraints by ranking them in a **strict dominance hierarchy**, where each constraint has absolute priority over all the lower-ranking constraints in the hierarchy combined. In this respect, too, OT is in contrast to VRM, whose output is determined by all relevant constraints. Third, constraints may be violated only when doing so allows satisfaction of higher-ranking constraint(s). Fourth, individual grammars are derived from the way the universal constraints are ranked. **Constraint re-ranking** offers a systematic way of deriving typological variation from universal grammar.[3] Fifth, Eval assesses the various candidate output forms and ranks them according to how well they satisfy the constraint system. The degree of success is cast in terms of **harmony**, where the most harmonic candidate least violates the constraint system. Any candidate form from Gen that best-satisfies or minimally violates the set of constraints is an optimal output associated with the input. It is important to note in this connection that in OT, it is possible and quite commonplace for an optimal candidate to violate constraints. The only requirement for a candidate to be **optimal** is that it is the minimal violator in the given candidate set. Finally, non-optimal candidates have no grammatical status. For example, no direct inferences about historical changes or variations may be drawn from their ranking.[4]

An example will help clarify how to compute harmony. Suppose a set of constraints are ranked in the order: A, B, C, D, E, in which A dominates B, B dominates C, and so on. Assume further a candidate set: W, X, Y, Z. Although candidates are, in principle, infinite, there are usually no more than a handful of serious candidates to consider, with all others failing for trivial reasons. The operation of an OT grammar is represented in tables like (3). The constraints are ranked from left to right as columns of the table, while the candidates are listed on separate rows:

(3)

Candidate	A >>	B >>	C >>	D >>	E
W		*	*!		
X	*!				*
→ Y		*		*	*
Z	*!				

The arrow points to an optimal candidate, the asterisks are violation marks, while an exclamation mark after an asterisk indicates the fatal violation for a non-optimal candidate. The shaded portions in the table indicate that they have nothing to do with the outcome at all.

Evaluation of the candidates proceeds as follows. Candidates W and Y tie in satisfying constraint A, and therefore the decision between them must be passed on to the subordinate constraints. Candidates X and Z also tie by violating A. This is a crucial failure and these candidates are eliminated from consideration. No amount of respect paid to subordinate constraints, i.e. B, C, D, and E, could rescue X and Z. Candidates W and Y also tie again, this time by violating B; neither violation is critical. Finally, W fails, but Y passes constraint C. Candidate W critically fails, and thus candidate Y emerges as optimal, a status indicated by the arrow. Although violations after critical decision points are noted for completeness, they have no bearing on the outcome.

There are two deviations from the standard OT view of a constraint system, i.e. strict dominance hierarchy as the determinant of typological variation.

First, OT allows constraints to tie (Broihier 1995, Kager 1994, Pesetsky 1995b, Zubritskaya 1994). This is one of OT ways of incorporating optionality.[5] Tied constraints form a block in the constraint hierarchy and set themselves apart from the other (lower and higher) constraints. I will use two versions of tied constraints in Chapter 3: the 'pooled violation' and 'reordering' version (Broihier 1995).

The 'pooled violation' version of tied constraints is at work when all violation marks from a block of tied constraints are combined into one column. The tie block as a whole serves as a single constraint. Evaluation proceeds as normal otherwise. For illustration, consider the following competition, in which constraints C, D, and E tie:

(4)

Candidate	A >>	B >>	C	D	E	F
→ X			*			*
Y				*	*!	
Z			*		*!	

(4) describes a situation in which candidates X, Y, and Z do not violate constraint A or B, but violate C, D, and/or E, which form a block. The tie block crucially dominates constraint F and is dominated by constraints A and B. Candidate X emerges as a winner, since it violates only one constraint in the tie block, while both Y and Z violate two constraints. It does not matter which constraint(s) in the tie block X, Y, and Z violate in this version of tied constraints. What is important is rather which candidate violates the smallest number of constraints in the tie block.

The 'reordering' version of tied constraints is illustrated in (5), in which the dotted vertical lines indicate that constraints C and D tie:

(5)

Candidates	A >>	B >>	C	D
W		*!		
X			*!	
→ Y				*
Z			*!	*

Candidates	A >>	B >>	D	C
W		*!		
→ X				*
Y			*!	
Z			*!	*

These variably ranked constraints behave as a cluster in terms of constraint ranking (see Tranel 1995 for a formulation of this observation). (5) describes a situation in which two rankings (6a,b) are simultaneously available:

(6) a. A > B > **C > D**
b. A > B > **D > C**

Candidates W, X, Y, and Z tie in passing constraint A, and therefore the decision among them must be passed on to the subordinate constraints. In contrast to candidate W, candidates X, Y, and Z tie, again, by satisfying constraint B. X violates constraint C, Y violates constraint D, while Z violates constraints C and D. Candidate Z must be eliminated from the competition, since in either ranking, Z falls short of X and Y. On the one hand, candidate Y emerges as a winner in (6a), since X violates C, the higher constraint (than D) (6a), while Y does not. On the other hand, candidate X is a winner in (6b), since Y violates D, the higher constraint (than C) in (6b), while X does not. Since these two rankings are simultaneously available in (5), we end up with two winners, candidates X and Y.

Second, OT allows constraint re-ranking not only for deriving cross-linguistic variations, but also for explaining language-internal (Itô and Mester 1995, Sells et al. 1995, Tranel 1994, Woolford 1995) ones. A particular set of morphemes may trigger re-ranking of constraints. In short, more than one constraint ranking may co-exist within a grammar.[6]

The general methodology used in OT is summarized in (7):

(7) Typology in Optimality Theory

1. Hypothesize a universal set of possible structural descriptions (Gen).
2. Hypothesize a universal set of well-formedness constraints (Con).
3. Consider all possible rankings of the constraints into dominance hierarchies; these define the predicted set of possible language-particular grammars.
4. For each possible hierarchy, determine the well-formed structures of the corresponding language.

OT recasts the relationship between **explanatory** and **descriptive adequacy** (Chomsky 1965) in terms of universal constraints and their relative ranking. OT takes the relative ranking of universal constraints as a grammar of a particular language and achieves

descriptive adequacy by handling all the data in a particular domain (e.g. syllabification, stress assignment, case marking) of a particular language. A further test of the explanatory value is to ask whether all possible ranking manifest real or, at least, plausible languages i.e. languages that could or could have existed. This final step is designed to ensure that all the constraints constitute universal grammar.[7]

2.3 Role and Reference Grammar

2.3.1 Projection Grammar

RRG is a structural-functionalist theory whose first detailed exposition appeared in Foley and Van Valin (1984). It is also a lexicalist theory which is based on a detailed lexical decomposition system à la Dowty (1979).

RRG claims that grammar may be explained only with reference to semantics and pragmatics and posits three parallel components, i.e. syntax, semantics, and pragmatics:

Table 1: RRG Projection Grammar

Syntax	Constituent Structure Operator Projection
Semantics	Semantic Structure: Thematic Relation (Logical Structure) Tier Macrorole (Actor/Undergoer) Tier
Pragmatics	Focus Structure

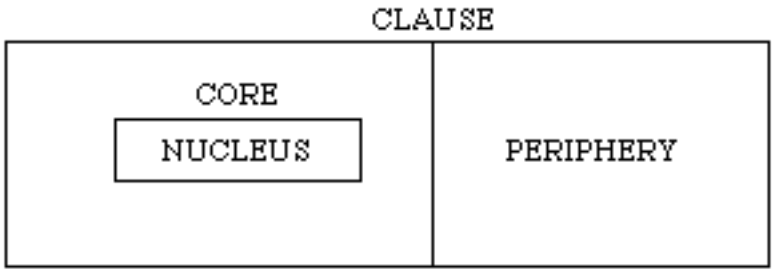
These parallel representations are termed **projections**. They are distinct but co-present and allow simultaneous access to each other. RRG is similar to **Lexical-Functional Grammar** [**LFG**] (Bresnan 1982a and articles therein), in that these modules of grammar are subject to different organization and governed by different principles. The component of syntax falls further into **constituent structure**, which carries both predicates and their argument(s), and **operators**, i.e. grammatical categories such as aspect, negation, modal, and tense which modify different layers of the clause. **Semantic structure** deals with the semantics of major lexical categories and has two independent tiers, the thematic relation tier and the macrorole tier. Finally, **focus structure** handles topic/focus assignment (cf.

Lambrecht 1994). In what follows, I will focus on those representations which are relevant to this work, constituent structure, operator projection, and semantic structure.

2.3.2 Constituent Structure: Simple Clause and Noun Phrase

There are three layers which constitute a **clause**, each enclosing the lower ones: the innermost layer is the **nucleus**, which corresponds to the predicate; the nucleus plus all the arguments of its predicate form the **core**; the outermost layer is the clause. The **periphery** consists of adjuncts, e.g. locative and temporal adverbials, which modify the core within the clause. The relation among these three layers, which is termed the **layered structure of the clause** [**LSC**], is diagrammed schematically in Figure 1:

Figure 1: Layered Structure of the Clause [LSC]



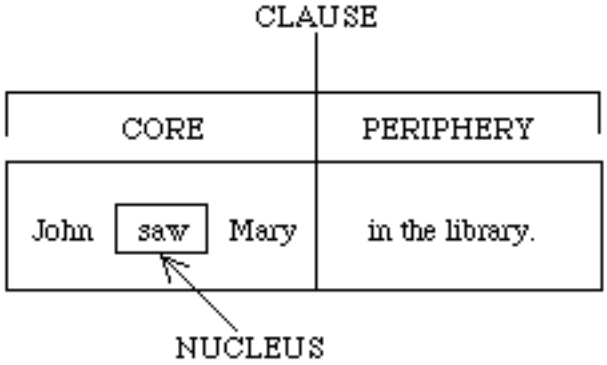
This layered structure serves as the foundation for the operator projection, which will be introduced in the next subsection, as well as for constituent structure. Table 2 is a summary of the organization of the LSC, while Figure 2 illustrates it:

Table 2: Three Layers of the Clause

Nucleus	Predicate
Core	Predicate + Argument(s)
Periphery	Non-Arguments (=Adjuncts)
Clause (= Core + Periphery)	Predicate + Argument(s) and Non-Arguments

This scheme is universal, since every language distinguishes between predicates and their arguments, and also distinguishes between NPs/AdPs which are arguments of the predicate and those which are not. The above three-way distinction represents immediate dominance relations and holds no matter what word order strategy a language may use:

Figure 2: LSC in English



Since constituent structure is unordered, it remains be explored how to derive an ordered sequence of constituents from constituent, semantic, and focus structure (see Van Valin 1993: 89-97 for an initial attempt). I propose to add another representation comparable to **surfotax** (Sadock 1990) or **word order domain** (Reape 1994; cf. Kathol 1995) which expresses linear precedence relations.

There are two additional elements which may appear in a sentence, the **precore slot** [**PCS**] and the **left-detached position** [**LDP**]. The PCS is clause-internal, but core-external. It is the position in which question words occur in languages such as English (8a) and German (8b), in which they normally do not occur *in situ*:

(8) a. What did you buy in the supermarket?

b.

Wem	gehört	das	Buch?
whom:DAT	belong:3SG	the:NOM	book:NOM

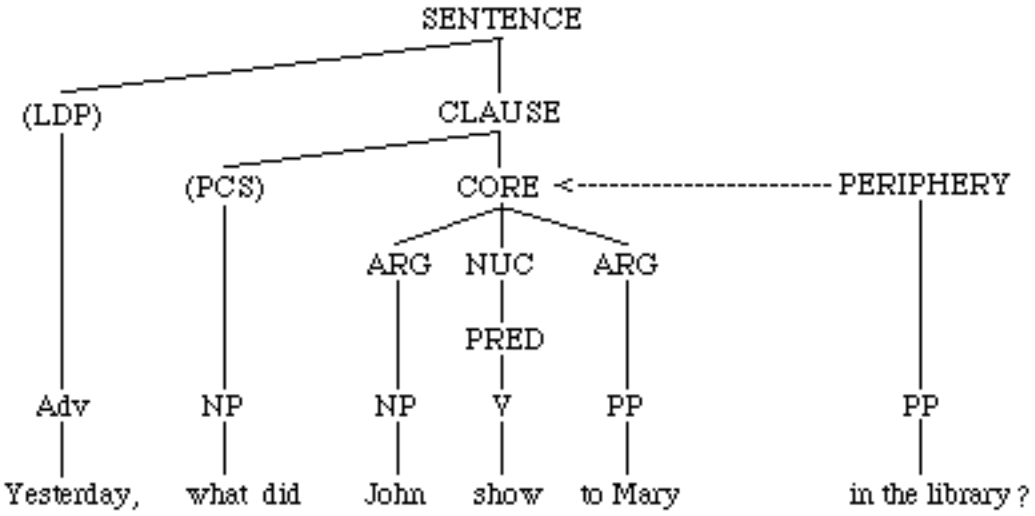
'Whom does the book belong to?'

The PCS is also the location for the fronted element in a sentence such as *Miso soup I hate*. In contrast, the LDP is clause-external. It is the location for sentence-initial elements, most commonly adverbials, which are separated from the clause by a pause. The LDP is always presupposed and hence never constitutes part of the assertion or question. Both LDP and PCS are structural positions which are treated on a par with nucleus, core, and clause.

(9) is an English example which contains all of nucleus, core, clause, PCS, and LDP, while Figure 3 diagrams its LSC. (9) is the clearest case which illustrates the opposition between the PCS and LDP in English:

(9) Yesterday, what did John show to Mary in the library?

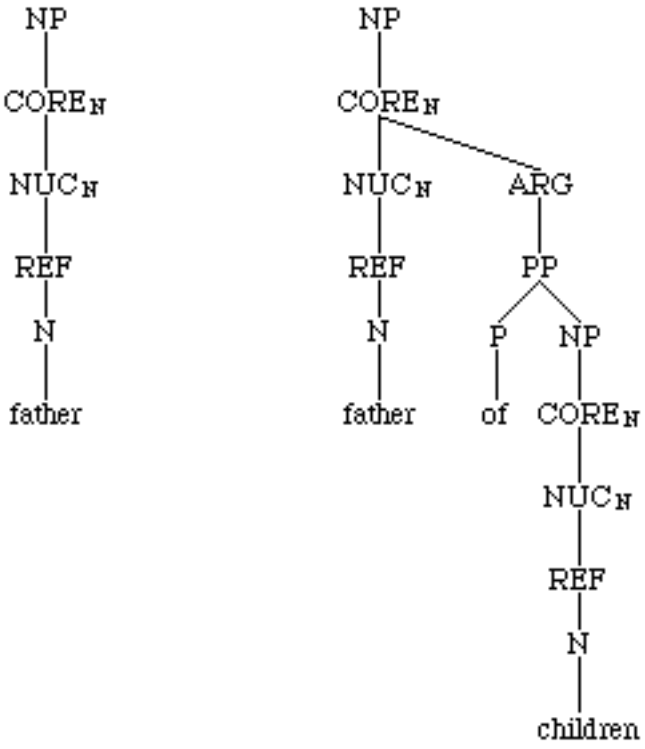
Figure 3: LSC of (9)



In Figure 3, an arrow indicates that the periphery serves as an adjunct to the core.

Van Valin and LaPolla (in press) extend this three-layered scheme to NP structures. The **layered structure of the NP** [**LSNP**] consists of a nominal nucleus (NUC_N) which dominates a referring element (REF) which is a noun (N). With a non-relational noun, the nucleus is the only constituent of the nominal core ($CORE_N$); with a relational noun, e.g. *father, friend, sister*, there is an argument in a PP headed by a non-predicative preposition *of*. There two structures are illustrated in Figure 4:

Figure 4: LSNP in English



Of is non-predicative in the above nominal construction, since it does not license an argument. Furthermore, it is semantically empty, since it can occur with argument NPs with a variety of semantic functions, as demonstrated by (10a)-(10e) (Van Valin and LaPolla in press: Ch.2):

(10)	a.	the attack of the killer bee	Agent
	b.	the gift of a new car	Theme
	c.	the destruction of the city	Patient
	d.	the leg of the table	Possessor
	e.	the presentation of Mary (with the award)	Recipient

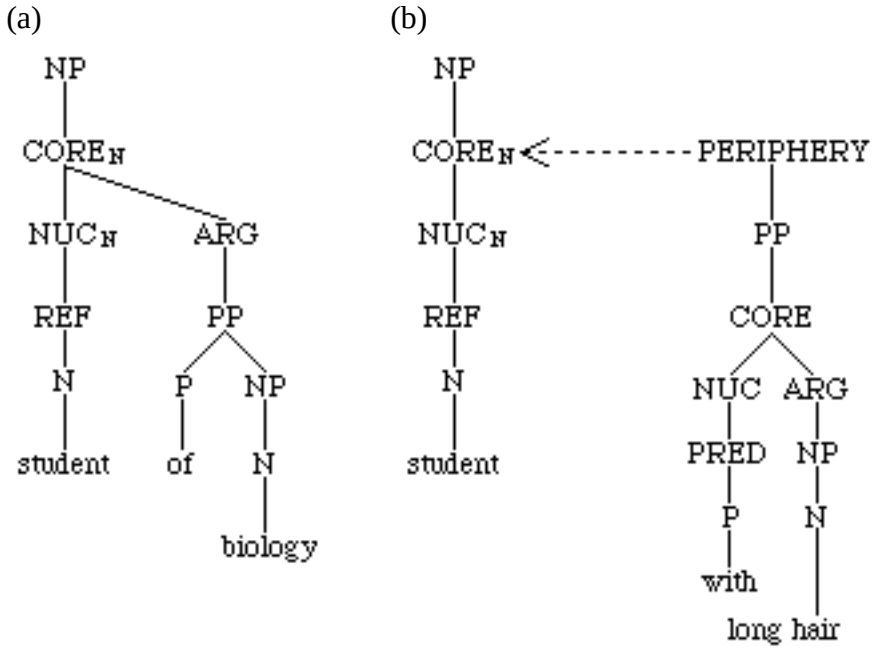
In contrast to *of*, predicative adpositions have well-defined semantic contents.

There is a structural distinction in NP structures which corresponds to that between core and periphery in clause structures. This is illustrated by (11a,b):

(11) a. a student of biology
b. a student with long hair

Student in (11a) is a relational noun which takes as argument an area which he/she majors in. In contrast, *with long hair* in (11b) is a predicative PP which specifies how the student looks. Figure 5 diagrams the core-periphery contrast in NP structures in English:

Figure 5: Core-Periphery Distinction in NP Structures



The structural difference between *of biology* and *with long hair* may be made explicit by appeal to *one*-substitution. Compare (12a) with (12b):

(12) a. *one (=student) of biology
b. one (=student) with long hair

If we may assume that *one* substitutes for a $core_N$ alone, and not a $nucleus_N$, we may attribute the contrast between (12a) and (12b) to that between Figure 5 (a) and Figure 5 (b); otherwise, the contrast between (12a) and (12b) would remain unexplained.

I postpone a treatment of possessor phrases, illustrated in (13), until the end of the next subsection, since they require reference not only to constituent structure, but also to the operator projection:

(13) Peter's arm/brother/book

2.3.3 Operator Projection

Grammatical categories such as aspect, tense, and modality and determiners, negation, and quantifiers are treated in RRG as clause-level and NP-level operators, which modify different layers of the clause and NP. Each of the clause and NP levels, i.e.

nucleus, core, and clause/NP, may be modified by one or more operators. RRG does not take the operators to be part of the layered structure of the clause/NP and separates them from the constituent structure. The major clause-level operators are listed in Table 3, and examples are given in (14):

Table 3: List of Nuclear, Core, and Clausal Operators

Nuclear operators:	Aspect Directionals (only those modifying orientation of action or event without reference to participants), Negation (e.g. *un*happy)
Core operators:	Directionals (only those expressing the orientation or motion of one participant with reference to another participant or to the speaker) Modality (root modals, e.g. ability, permission, obligation) Internal (i.e. narrow scope) negation
Clausal operators:	Status (e.g. epistemic modals, external negation) Tense, Evidentials, Illocutionary Force

(14) English

1. He may be leaving soon.	TENSE/STATUS (clausal)-ASPECT (nuclear)
2. She had been able to see them.	TENSE (clausal)-MODALITY (core)
3. Will they have to be leaving?	IF/TENSE (clausal)-MODALITY (core) -ASPECT (nuclear)

Japanese

1. Taroo-ga Hanako-o naguri-hajime-ta.
   Taro-NOM Hanako-ACC hit-begin-PAST
   'Taro began to hit Hanako'.

   ASPECT (nuclear)-TENSE (clausal)

2. Taroo-ga okasi-o tabe-ta-daroo.
   Taro-NOM cake-ACC eat-PAST-probably
   'Taro might have eaten a cake'.

   TENSE (clausal)-STATUS (clausal)

3. Taroo-ga Hanako-ni hanasi-owara-nakat-ta.
   Taro-NOM Hanako-DAT talk-finish-NEG-PAST
   'Taro did not finish talking to Hanako'.

   ASPECT (nuclear)-NEGATION (core)-TENSE (clausal)

The nuclear operators have scope over the nucleus; they modify the action, event, or state with no reference to the participants. For example, aspect is a nuclear modifier, since it tells us about the internal temporal structure of the event itself, without any reference to anything

else. The core operators modify the relationship between a core argument, most typically the actor, and the action. This is true of core directionals, modality, and internal negation, as illustrated by (15a)-(15c):

(15) a. John went *away* from the restaurant.
b. Mary *must* leave the party early.
c. Tom did *not* drop the charge against his boss.

Away in (15a) refers to the relationship between *John* and his action. *John* is located with reference to *the restaurant* and is described as going further and further from it. Likewise, *must* in (15b) refers to the relationship of obligation between *Mary* and *leaving*. *Not* in (15c) negates the direct object *the charge* alone, not the entire clause. Finally, clausal operators such as tense and evidentials modify the entire clause. For example, tense describes the relationship between the time of the utterance and the time of the event which is denoted by the entire clause.

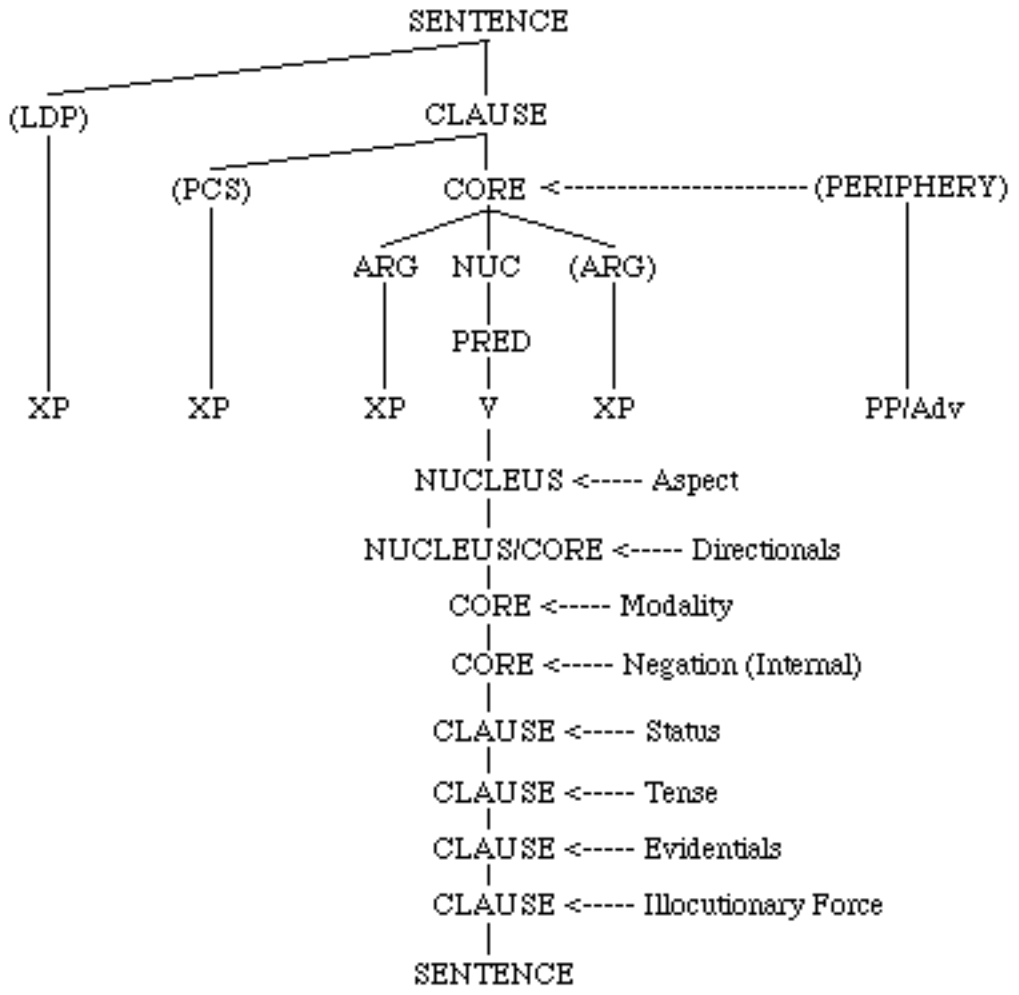
A look at the set of examples given in (14) suggests that core operators always occur outside nucleus ones and that clausal operators occur outside core operators. Foley and Van Valin (1984) propose (16) to capture linear distribution of these three types of operators:

(16) **Universal Scope Principle**
The ordering of the morphemes expressing operators with respect to the verb indicates their relative scope.

That is, when an ordering relationship may be established among operators, they always have to be ordered in the same linear order, i.e. in such a way that their linear order reflects their scopal relations in an iconic way (see Bybee 1985 for an analogous proposal). For example, (16) predicts that if both tense and aspect are suffixes, the aspect suffix will come between the verb stem and the tense suffix. There are few exceptions to (16), in contrast with predicates and their argument(s), whose ordering is subject to language-particular conventions. (16) applies to NP-level operators as well as clause-level ones.

One may get the complete picture of the clause by combining the operators with the constituent structure, i.e. the predicate and its argument(s):

Figure 6: Formal Representation of the Clause Structure



Constituent structure and operator projection are linked through the verb, since it is the only crucial element common to both. This separation has an advantage of making it very clear that operators are ordered with respect to each other in terms of their scope.

An important feature of the RRG view of clausal syntax is a separation between constituent structure and operator projection. This also constitutes an essential feature of the layered structure of the NP [LSNP]. NP-level operators include determiners in general (e.g. definite/indefinite articles, demonstratives, deictics), quantifiers, numbers, negation, nominal aspect (i.e. mass/count distinction), and adjectival/nominal modifiers. Table 4 lists up a variety of NP-level operators in English on the basis of which layer they modify: $nucleus_N$ operators, $core_N$ operators, and NP operators:

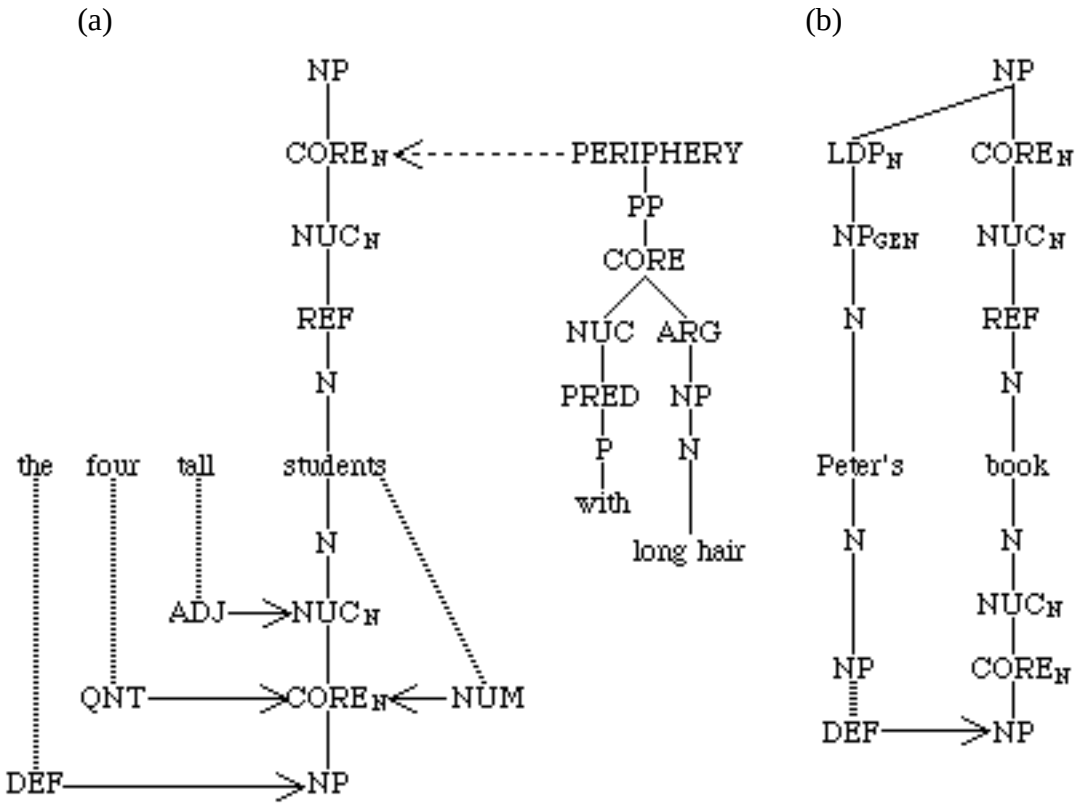
Table 4: List of $Nuclear_N$, $Core_N$, and NP Operators in English

$Nucleus_N$ operators:	Adjectival/Nominal modifier, nominal aspect (i.e. count vs. mass)
$Core_N$ operators:	Quantifiers, negation, numbers
NP operators:	Determiners (articles, demonstratives, deictics)

A word is in order about how to treat possessive phrases in this system. NPs that contain a genitive NP in the LDP are interpreted as definite. This suggests that the possessor phrase does double duty; it is not only part of the constituent projection which signals possession, but also part of the operator projection which signals definiteness. This dual status sets possessive phrases apart from other NP-level operators.

Two English examples are given below: one (Figure 7 (a)) contains all three types of NP-level operators, while the other (Figure 7 (b)) contains a possessive phrase *Peter's*:

Figure 7: LSNP with Operators in English



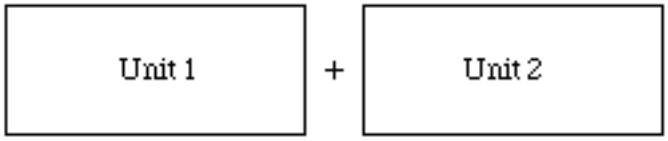
$Core_N$ operators such as quantifiers have scope over peripheral modifiers, e.g. *with long hair* in Figure 7 (a), which modify cores. I refer the reader to Van Valin and LaPolla (in press: Ch.8) for a detailed account of complex NPs and their linking.

2.3.4 Complex Sentences: A Typology of Clause Linkage

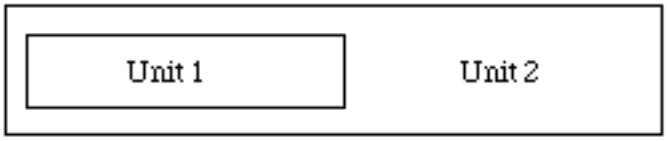
The LSC and operator projection set the stage for the RRG theory of complex sentences. There are two parameters which constitute the RRG typology of complex sentences, **juncture** and **nexus**. Juncture is concerned with what type of unit is linked, while nexus is concerned with how two or more units are linked. Juncture has three subtypes, **nuclear**, **core**, and **clausal juncture**. On the other hand, nexus has as many subtypes, **coordination**, **subordination**, and **cosubordination**:

Figure 8: Three Nexus Types

(a) Coordination



(b) Subordination

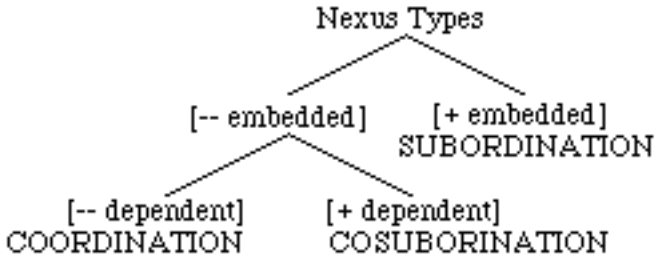


(c) Cosubordination

Coordination arises from joining two or more units of equal status, while subordination involves embedding one unit in another. The embedded unit does not normally have the form of an independent main clause. In addition to these two traditional types, RRG introduces a new nexus type, cosubordination, which was originally proposed in Olson (1981). In a cosubordinate linkage at a given level of juncture, the linked units depend on the matrix unit for expression of one or more of the operators for that level. The distinctive feature of cosubordination as opposed to coordination is the shared operator(s) at the level of juncture. For example, core cosubordination involves a combination of more than one core who have to share core (as well as clausal) operators.

The foregoing discussion suggests that subordination differs from coordination and cosubordination in terms of embedding or structural dependence, while cosubordination is distinguished from coordination in terms of operator dependence. Cosubordination may be described as "dependent coordination" in a sense. The relationship among these three nexus types may be represented in terms of two features, [±embedding] and [±dependence], as shown in Figure 9:

Figure 9: Features Defining Nexus Types



These nexus types may be ordered according to the degree of independence, as in (17):

(17) Coordination > Subordination > Cosubordination

Cosubordination is less independent than subordination, since it involves operator sharing, but not structural dependence.

There are three possible levels of juncture, nuclear, core, and clausal, and there are also three possible nexus relations among the units in the juncture, coordination, subordination, and cosubordination. All three types of nexus are available in all three forms of juncture, and hence there are nine possible juncture-nexus types. They may be ranked in terms of the tightness of the syntactic bond, as shown in Figure 10:

Figure 10: Tightness of the Syntactic Bond in Juncture-Nexus Types

Nuclear Cosubordination	Tightest integration into a single unit
Nuclear Subordination	
Nuclear Coordination	
Core Cosubordination	
Core Subordination	
Core Coordination	
Clausal Cosubordination	
Clausal Subordination	
Clausal Coordination	Least integration into a single unit

As one goes up the above hierarchy, the linked unit loses more and more features of an independent clause until it is reduced to a bare nucleus in nuclear cosubordination. These juncture-nexus types form a finite set of universally available schemata and represent a very general set of constraints on how complex sentences are formed. It is important to keep in mind that languages need not have all of these nine juncture-nexus types; they represent the maximum number of nexus-juncture types which a single language could have. Different languages use different subsets of the above set of schemata.

In what follows in this subsection, I will concentrate on nuclear and core junctures, since they pose interesting questions about case marking and provide a basic schema for clause structures of constructions in Japanese, Korean, Icelandic, and Imbabura Quechua which will be investigated in Chapters 3-6.

Let us begin with nuclear junctures, **nuclear coordination**, **cosubordination**, and **subordination**, which are respectively illustrated by (18a)-(18c):

(18) a. Nuclear Coordination

Fu	vazai	ufu	furi	numu	akoe.
3SG	grass	cut	finish	pile	throw.away

'He finished cutting, piled, and threw away the grass'.

b. Nuclear Cosubordination

Je	ferai	manger	les pommes	à	Jean.
1SG	make:FUT	eat	the apples	DAT	Jean

'I will make Jean eat the apples'.

c. Nuclear Subordination

Kooen-de	Taroo-ga	arui-te-i-ta.
park-INSTR	Taro-NOM	walk-LINK-be-PAST

'Taro was walking in the park'.

(18a) is from Barai (Papuan: Olson 1981), (18b) is from French, while (18c) comes from Japanese. All of them involve a combination of more than one nucleus to form a complex nucleus with a single set of core arguments.

(18a) is an example of nuclear coordination. The definitional feature of coordination is that it allows each nucleus, core, and clause to be modified respectively by nuclear, core, and clausal operators independently. Thus, nuclear coordination should allow each nucleus to have its own nuclear operator. (18a) fits into this definition, since it allows the first

nucleus *ufu* 'cut' alone to be modified by an aspectual operator *furi* 'finish'.[8] This nuclear operator does not have scope over the other two nuclei, *numu* 'pile' and *akoe* 'throw away'. The constituent structure of (18a) with its operator projection is diagrammed in Figure 11:

Figure 11: Barai Nuclear Coordination (18a)

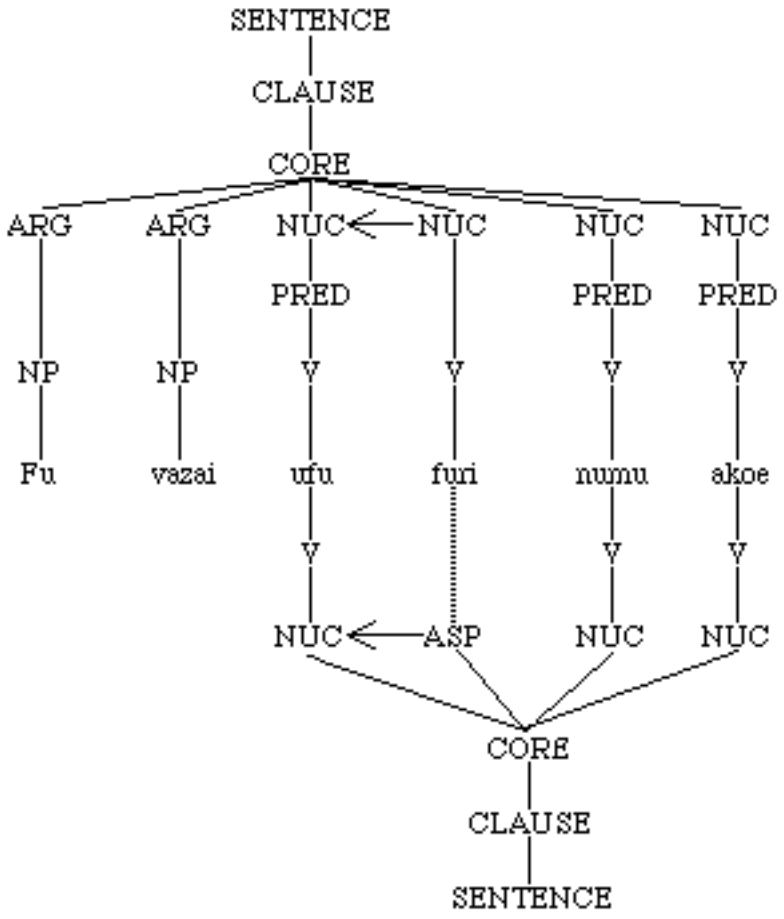
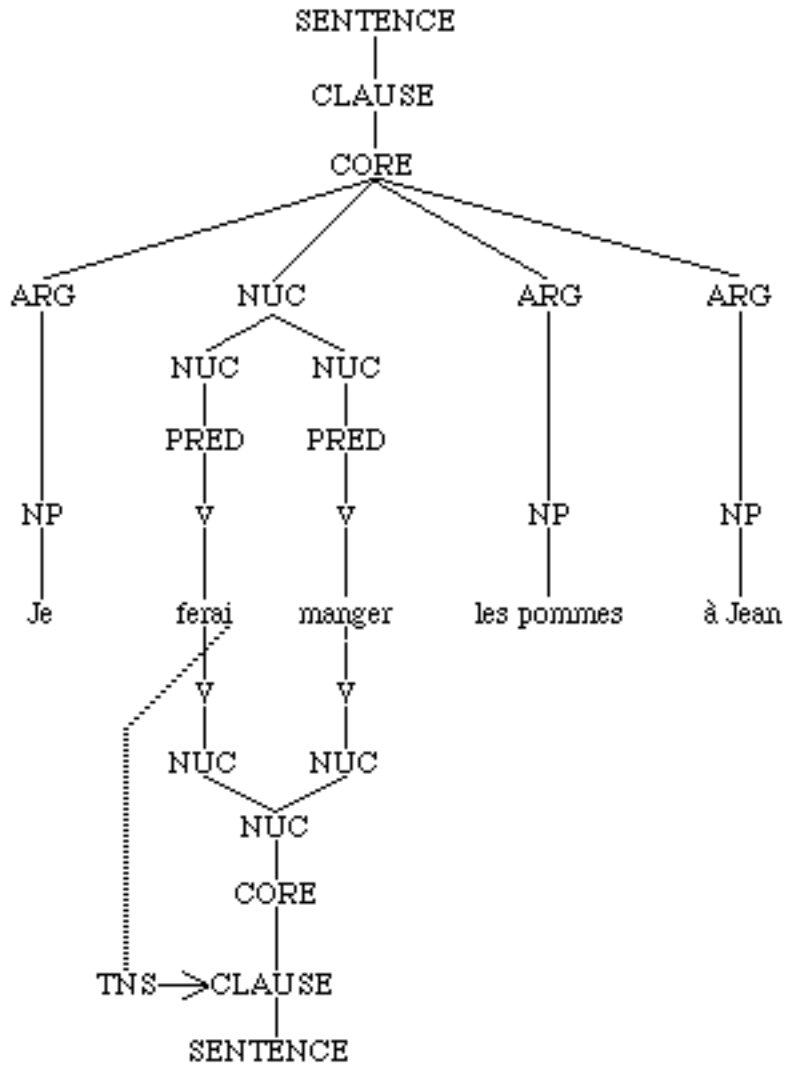


Figure 11 shows that the nuclear operator *furi* 'finish' modifies only *ufu* 'cut', while leaving the other two nuclei outside its scope.

(18b) illustrates nuclear cosubordination. The defining feature of cosubordination at the nuclear level is that it forces more than one nucleus which form a complex nucleus to share nuclear operators. In other words, it is impossible for any nuclear operator to modify each nucleus independently. The constituent structure of (18b) with its operator projection is given in Figure 12:

Figure 12: French Nuclear Cosubordination (18b)



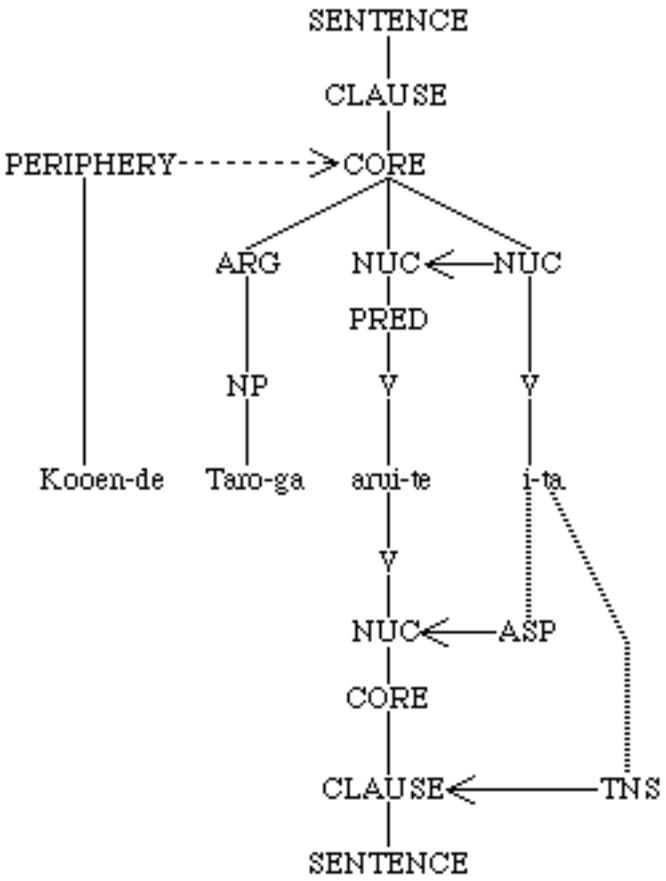
English examples of nuclear cosubordination in English are given in (19a,b):

(19) a. John *painted* the house *red.*
b. Mary *forced open* the door.

Both of them describe a state resulting from the subject's action. The complex nuclei in (19a) and (19b) are italicized. A series of nuclei which form a complex nucleus with a single set of core arguments are normally adjacent to each other. This is illustrated by the French example (18b), in which the causative predicate *ferai* is adjacent to the dependent predicate *manger* 'eat'. However, (19a) illustrates that they do not have to be. The most crucial feature of nuclear cosubordination is an obligatory sharing of nuclear operator(s).

(18c) exemplifies nuclear subordination. The hallmark of nuclear subordination is that the subordinate nucleus does not function as predicate, but rather as modifier. The structure of (18c) is presented in Figure 12:

Figure 13: Japanese Nuclear Subordination (18c)



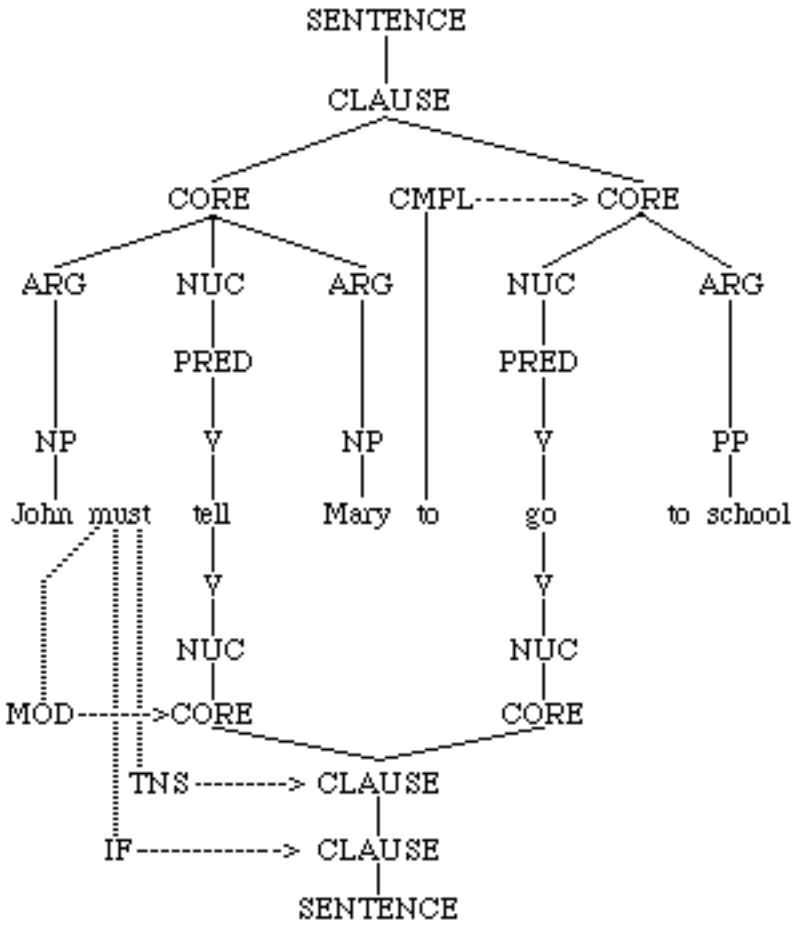
The use of verbs as aspectual operator in serial verb constructions such as (18c) is the prime example of nuclear subordination. The subordinate nucleus in (18c) is represented as a NUC node which dominates a verb which is not a predicate (hence no PRED label) but rather a modifier. It is not a predicate, since it does not contribute any arguments to the core. What is peculiar about nuclear subordination is that the subordinate nucleus not only occupies a slot in constituent structure, but is an operator in the operator projection, since it functions as an aspectual operator, in this case a progressive operator. This is the only nexus-juncture type in which a verb is represented as a constituent in one projection and as an operator in the other.[9]

Let us proceed to core junctures. (20a) and (20b) illustrate core coordination and cosubordination, respectively. They are distinguished from core subordination, illustrated in (20c), which involves structural embedding:

(20) a. Core Coordination
John must tell Mary to go to school.
Core Cosubordination
b. John must try to open the window.
Core Subordination
c. John regretted *Mary's losing the race*.

Suppose that *must* in (20a,b) is a deontic modal operator. The definitional feature of core coordination is that it allows each core to be modified by core operators independently. (20a) fits in this characterization, since *must* in (20a) has scope only over the matrix core; What *John* is obliged to do is *tell Mary*, but *Mary* is not obliged to *go to* school:

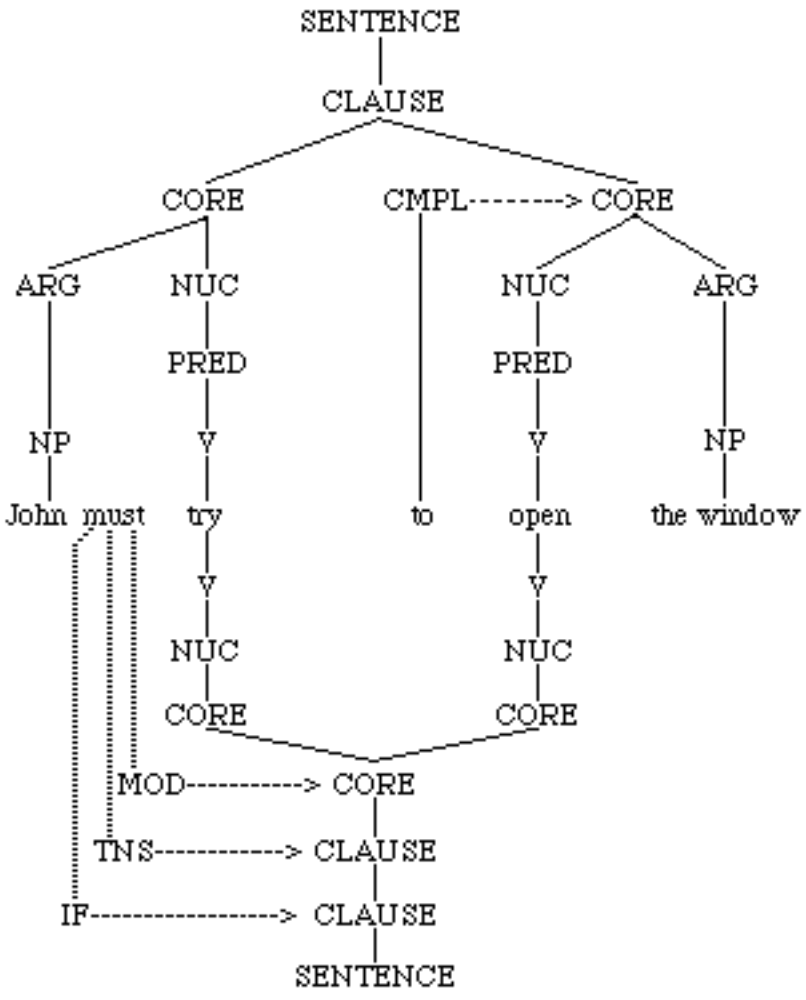
Figure 14: English Core Coordination (20a)



The constituent structure of (20a) with its operator projection is diagrammed in Figure 14 above.

In contrast, the distinctive feature of core cosubordination is that it forces all cores to share core operators such as deontic modal. Thus, in (20b), the core operator *must* has scope over both cores; what *John* is obliged to do is *try to open the window*, but not only *try*. Both (20a) and (20b) have two nuclei, each with its own set of core arguments, constituting two distinct but overlapping cores; they overlap in that the linked units share one core argument. Their difference, then, boils down to whether or not (20a) and (20b) may share core operators like deontic modal. The constituent structure of (20b) is given in Figure 15:

Figure 15: English Core Cosubordination (20b)



Finally, (20c) involves core subordination. The dependent unit, italicized in (20c), serves as a core argument of the nucleus in the matrix core. True subordination at the core level involves the subordinate unit serving as a core argument. The gerund in (20c) may also occur as the pivot in a passive construction, since it is a core argument:

(21) *Mary's losing the race* was regretted by John.

(21) stands in contrast with (22a,b), the passive counterparts of (20a) and (20b):

(22) a. *To go to school must be told Mary by John.
b. *To open the window must be tried by John.

That these infinitives do not passivize, unlike the gerund in (19c), shows that they are not core arguments of the matrix verbs and hence not in a subordinate relation to the matrix core.

To sum up this subsection, constituent structure and operator projection, both of which are based on the LSC, serve as the basis for the RRG theory of simple and complex sentences. Their factorization into separate dimensions receives support from the fact that coordination and cosubordination differ only with respect to operator dependence.

2.3.5 Semantic Structure

2.3.5.1 Verbs and Their Arguments

RRG differs from all varieties of generative grammar by using a rich system of decompositional representations of verbal semantics (see Butt 1994, however, for an initial attempt to incorporate those representations into LFG). Semantic structure consists of two independent subtiers, the thematic relation tier and the macrorole tier. Each argument of a predicate bears a relation to both tiers.

The thematic relation tier is based on Vendler's (1967) four-way aspectual classification of verbs, **states**, **achievements**, **accomplishments**, and **activities** (see Dowty 1979 for an alternative). They are distinguished from each other on the basis of their temporal properties. States are non-dynamic and temporally unbounded, activities are dynamic and temporally unbounded, achievements are temporally bounded instantaneous

changes, while accomplishments refer to temporally extended, i.e. not instantaneous, changes of state leading to a result. Van Valin and LaPolla (in press: Ch.3) characterize those aspectual classes in terms of a combination of three features, [dynamic], [telic], and [punctual]. Each class is illustrated by a few English verbs in (23a)-(23d):

(23) a. State [-- dynamic], [-- telic], [-- punctual]
e.g. *be tough, be tall, hate, believe, belong to*

b. Activity [+ dynamic], [-- telic], [-- punctual]
e.g. *walk, run, roll, swim, eat*

c. Accomplishment [+ dynamic], [+ telic], [-- punctual]
e.g. *melt, freeze, dry, learn*

d. Achievement [+ dynamic], [+ telic], [+ punctual]
e.g. *explode, shatter, crash, burst*

(23) is different from the ones proposed by Dowty (1979), Foley and Van Valin (1984), and Van Valin (1993), in that causation is taken to be orthogonal to aspectual properties such as telicity (see also Jackendoff 1990 and Koenig 1994 for analogous proposals) in (23).

There are a set of syntactic and semantic tests for assigning verbs to these four classes, some of which are taken from Dowty (1979):

Table 5: Tests for Determining Aktionsart Types

Criterion	States	Activities	Achievements	Accomplishments
1. Occurs with progressive	No	Yes	No	Yes
2. Occurs with adverbs like *vigorously*, *actively*, etc.	No	Yes	No	No
3. Occurs with adverbs like *quickly*, *slowly*, etc.	No	Yes	No	Yes
4. Occurs with *X for an hour*, *spend an hour X ing*	Yes	Yes	No	Yes
5. Occurs with *X in an hour*, *take an hour to X*	No	No	No	Yes
6. *X for an hour* entails *X* at all times in the hour	Yes	Yes	d.n.a.	No
7. *Z is Xing* entails Z has Xed	d.n.a.	Yes	d.n.a.	No

Test 1 is useful only in languages with a progressive aspect, e.g. English, Icelandic. It may be taken as an indicator of [+ dynamic] plus [-- punctual], because it can occur with activity (24c) and accomplishment (24d) verbs, not with state (24a) or achievement (24b) verbs:

(24) a. *Peter is being fat/a physician/a student.
b. *The time bomb was exploding in the station.
c. John is running/swimming/dancing all night long.
d. The snow was melting in the sun.

Test 3 applies only to [+ dynamic] verbs and serves to distinguish [-- punctual] (25a) from [+ punctual] (25b) verbs.

(25) a. The snow was melting slowly in the sun.
b. *The bomb exploded quickly in the station.

Pace adverbs such as *slowly* and *quickly* can occur with accomplishment verbs, but not with achievement verbs, which have little temporal duration. Tests 4 and 5 distinguish between [+ telic] and [-- telic] verbs, while tests 6 and 7 set accomplishment verbs (24b) apart from activity verbs (26a):

(26) a. Mary was singing -----> Mary had sang.
b. The snow was melting --/--> The snow had melted.

Finally, test 2 is used to pick up [+ dynamic] verbs (27d,e):

(27) a. *Peter is vigorously fat/a physician/a student.
b. *The time bomb was exploding vigorously.
c. *The snow was melting vigorously in the sun.
d. John is running/swimming/dancing vigorously.
e. The committee actively evaluated his proposal.

Each of these *Aktionsart* types has a corresponding causative type, as illustrated in (28)-(31):

(28)	a.	State:	The boy is afraid of the dog.
	b.	Causative state:	The dog frightens the boy.
(29)	a.	Achievement:	The balloon popped.
	b.	Causative achievement:	The dog popped the balloon.
(30)	a.	Accomplishment:	The ice melted.
	b.	Causative accomplishment:	The hot water melted the ice.
(31)	a.	Activity:	The ball rolled.
	b.	Causative activity:	The boy rolled the ball to the pond.

(28)-(31) show that causation is orthogonal to the temporal properties of verbs. The addition of causation does not affect their aspectual properties. These tests are certainly not

perfect, but they are combined to form a reliable set of criteria to distinguish those four aspectual classes from each other.

A word is now in order for alternations between two *Aktionsart* types. Those alternations often arise as a result of the interaction between a verb's lexical property and the context in which it occurs. A very important alternation among them is the one between activities and accomplishments, which is illustrated by English examples (32) and (33):

(32) a. John walked in the park for an hour.
b. John walked to the park in an hour.
(33) a. John ate spaghetti for twenty minutes.
b. John ate a plate of spaghetti in ten minutes.

(32a)-(33a) are activities, while (32b)-(33b) are accomplishments. If motion verbs have a definite goal (which provides an endpoint), they behave like accomplishments; if they do not have a definite goal, they behave like activities. The same contrast is observed in (33a,b). The verb *eat* behaves as activity when they have an object, as in (33a), which is a mass noun or bare plural. In contrast, (33b) is an accomplishment, since there is a specified amount, which provides a delimitation of the event. That is, the terminal point is reached when all of the spaghetti has been consumed. Van Valin and LaPolla (in press: Ch.3) term these accomplishment uses of activity verbs **active accomplishment**.

Van Valin and LaPolla (in press: Ch.3) sum up these verb classes as in Table 6:

Table 6: Lexical Representations for *Aktionsart* Classes

Verb Class	Logical Structure
STATE	**predicate'** (x) or (x, y)
ACTIVITY	**do'** (x, [**predicate'** (x) or (x, y)])
ACHIEVEMENT	INGR **predicate'** (x) or (x, y)
ACCOMPLISHMENT	BECOME **predicate'** (x) or (x, y)
ACTIVE ACCOMPLISHMENT	**do'** (x, [**predicate$_1$'** (x)]) & BECOME **predicate$_2$'** (y, x) **do'** (x, [**predicate$_1$'** (x, y)]) & BECOME **predicate$_2$'** (y)
CAUSATIVE	'X' CAUSE 'Y', where 'X' and 'Y' are LSs of any type.

'&' in Table 6 means 'and then'. These representations are termed **logical structures** [**LS**]. RRG follows the conventions of formal semantics in presenting constants (normally predicates) in boldface, followed by a prime and variable elements in normal typeface.

States and activities are treated as simple predicates in this decompositional system. There is no special formal indicator which marks stative predicates, whereas all activity verbs contain the generalized activity predicate **do'**, which serves as the marker of membership in this class. These two classes are the most basic; they are building blocks for all the other classes. Achievement and accomplishment verbs consist of a state or activity predicate and a symbol for change. 'INGR' stands for 'ingressive' and encodes instantaneous changes, while 'BECOME' represents change over some temporal span. 'INGR' and 'BECOME', thus, serve as the marker of achievement and accomplishment verbs, respectively.

It might seem to be odd to assume a complex structure for simple activity verbs such as *walk* and *run*, but there are many languages which construct activity predications that way. Basque is a good example of this. Almost all verbal expressions that correspond to intransitive activity verbs in languages such as English are created by combining a noun with the verb *egin* 'do', as illustrated by (34):

(34) Ni-k lan-Ø egin d-u-t.
1SG-ERG work-NOM do 3SG:NOM-AUX-1SG:ERG
'I did work'.

Other combinations include *amets egin* 'to dream', *negar egin* 'to cry', *igeri egin* 'to swim', and *barre egin* 'to laugh'. The first LS of active accomplishments in Table 6 is for (32b), while the second one is for (33b), as shown by (35a,b):

(35) a. **do'** (John, [**walk'** (John)]) & BECOME **be-at'** (park, John)
b. **do'** (John, [**eat'** (John, spaghetti)]) & BECOME **consumed'** (spaghetti)

(35a) and (35b) represent a situation in which the subject got into some state as a result of his activity. Finally, it is important to note that the elements in boldface plus prime, e.g. **melted'**, **be-at'**, **hear'**, **run'**, are part of the vocabulary of the semantic metalanguage used in the decomposition. They are not words taken from any particular natural language.

LSs with variables in the argument positions as given in Table 6 are the cores of the lexical entry for a verb and are the basis for the RRG theory of **thematic relations**. RRG follows the spirit of Jackendoff (1976, 1983) in defining thematic relations in terms of argument positions in decompositional representations. The derivation of thematic

relations from argument positions in LSs entails that the assignment of thematic relations to verbs in RRG is independently motivated. The definitions are summarized in Table 7:

Table 7: Thematic Relation Assignment [10]

1. STATE VERBS			
A. Locational	**be-at'** (x, y)	x=locative	y=theme
B. Non-locational			
1. State or condition	**predicate'** (x)	x=patient	
2. Perception	**see'** (x, y)	x=experiencer	y=theme
3. Cognition	**believe'** (x, y)	x=experiencer	y=theme
4. Possession	**have'** (x, y)	x=locative	y=theme
2. ACTIVITY VERBS			
A. Single argument	**do'** (x, [**predicate'** (x)])	x=effector	
B. Two arguments	**do'** (x, [**predicate'** (x, y)])	x=effector	y=locus

Locus in Table 7 refers to the object in *John drank wine for an hour*. Only two types of predicates, states and activities, define thematic relations. All the other types are derived from these two basic types. The second argument of multiple activity verbs is typically non-referential and hence are distinguished from all the other arguments in Table 6, which are normally referential.[11]

The label of effector refers to a participant that brings about something, but there is no implication of its being volitional or original instigator. It is the effecting participant by definition, but covers **agent**, **force**, and **instrument**. The crucial question, then, is how to derive agent, force, and instrument from this underspecified characterization of effector, i.e. the first argument of an activity predicate **do'**.

Agents have two additional meanings in addition to bringing about something: control and intent. That is, agents are willful initiating participants. The reason agents are not listed in Table 7 is that agency is a pragmatic implicature which arises from the way a particular verb is used in sentential contexts, but it is normally not an inherent lexical property of the verb (Holisky 1987). This is confirmed by the contrast between (36a) and (36b):

(36) a. John killed his wife on purpose.
b. John killed his wife accidentally.

The fact that *kill* can occur with an agency-canceling adverb such as *accidentally* suggests that *kill* does not lexicalize agency. The verb *kill* is in contrast to the verb *murder*, which lexicalizes agency:

(37) a. John murdered his wife on purpose.
b. *John murdered his wife accidentally.

It is prudent, then, to put the operator DO when the verb lexicalize agency and keep the lexical entries of other activity verbs underspecified with respect to agency. The lexical entries of *kill* and *murder* are given in (38a) and (38b), respectively.

(38) a. *kill* [**do'** (x, ø)] CAUSE [BECOME **dead'** (y)]
b. *murder* DO (x, [[**do'** (x, ø)] CAUSE [BECOME **dead'** (y)]])

Forces and instruments are not listed in Table 7 either, since they are subtypes of effector. Forces are inanimate effectors which share two essential features with human and animate effectors: they can act and move independently. In addition, forces are not under the control of another effector. In contrast, instruments are not capable of moving or acting independently and are under another effector's control.

(39) and (40) indicate how forces and instruments are represented in LS terms:

(39) a. The typhoon destroyed the town with its high winds.
b. [**do'** (typhoon, ø)] CAUSE [BECOME **destroyed'** (town)]
(40) a. John broke the window with a chair.
b. [**do'** (John, ø)] CAUSE [**do'** (chair, [BECOME **be-at'** (window, chair)])]] CAUSE [BECOME **broken'** (window)]

The causing event in (40) is complex. The instrument argument is the inanimate effector in the second argument of the subordinate CAUSE. The definitions of force and instrument are given in (41):

(41) a. Force: Inanimate 'x' argument in the LS configuration below
b. Instrument: Inanimate 'y' argument in the LS configuration below

[[**do'** (x, [....])] CAUSE [**do'** (y, [....])]] CAUSE [BECOME/INGR **predicate'** (….)]

If 'x' in (41) were animate, it would be a good candidate for agent.

The second tier of semantic roles consists of **macroroles**, **actor** and **undergoer**. These are generalized semantic roles which correspond to the two primary arguments of a

transitive verb, but unlike Dowty's (1991) **proto-roles**, constitute a tier independent of the thematic relation tier.[12] They are termed macroroles, since each subsumes a number of thematic relations for syntactic purposes and act as the interface between thematic relations and grammatical relations. The necessity to make reference to macroroles in syntax is demonstrated by the following findings:

(42) a. Van Valin (1991) shows that verb agreement in Icelandic is controlled only by macrorole arguments and that nominative case is assigned to macroroles arguments alone.

b. Yang (1994) shows that quantifier floating in Korean may be launched only by macrorole arguments.

c. Nakamura (1995c) shows that long-distance quantifier floating may be hosted only by undergoers in Japanese (cf. Tsujimura 1989).

d. Van Valin (1990) shows that resultative expressions may be controlled only by undergoers in English.

e. Farrell (1994) argues that participial adjectives in English may modify initial 2 of the verbal base (which may be equated with undergoer).

f. Durie (1987) shows that in control constructions in Acehnese, the omitted argument in the embedded core is always an actor.

g. Kishimoto (1996) shows that the distinction between actor and undergoer controls the unaccusative-unergative distinction in Japanese.

h. Harris (1981) shows that **initial 1** (which may be equated with an actor in RRG terms) can control reflexivization in Georgian.

This list is far from exhaustive.

It is important to note at this juncture that just as actor is not equivalent to agent, it is likewise not equivalent to syntactic subject. Likewise, undergoer is neither equivalent to patient nor syntactic direct object. This can be seen clearly in (43):

(43) a. John [SUBJ, ACTOR] ate the sandwich [DOBJ, UNDERGOER].
b. The sandwich [SUBJ, UNDERGOER] was eaten by John [ACTOR].
c. It [SUBJ] rained yesterday.
d. The boy [SUBJ, ACTOR] ran down the stairs.
e. The boy [SUBJ, UNDERGOER] got sick.

(43b,e) show that undergoers as well as actors can serve as the subject. That is, undergoers are not always equivalent to direct objects. (43b) also show that actors are not always subjects. In the passive construction (43b), the actor has the status of syntactic adjunct.

A natural question that arises at this juncture is which macrorole value is marked, [+ MR] or [-- MR]. The fact that many syntactic processes have to refer to macroroles, actors, or undergoers, as demonstrated by (42a)-(42h), while there seem to be few, if any, syntactic processes which refer exclusively to non-macroroles seems to suggest that non-macroroles, i.e. [-- MR], is the unmarked value. I follow the spirit of Archangeli (1984) in assuming that only the marked value [+ MR] is present in lexical representation, while the unmarked value [-- MR] is supplied by the default rule in syntactic representation.[13] (44) and (45) are my proposal:

(44) **Macrorole Underspecification** [14]
The marked feature [+ MR] is present in lexical representation, while the unmarked feature [-- MR] is underspecified lexically and supplied by the default rule (45) in syntactic representation.

(45) Default Rule: [ ] ------> [-- MR]

(44) allows a violation of the biuniqueness condition on the mapping between thematic relations and macroroles, which is assumed in Van Valin (1993) and Van Valin and LaPolla (in press). I will explore the consequence of (44) and (45) in Chapters 5 and 6.

The association between these two tiers, the thematic relation tier and the MR tier, within semantic structure is captured by the **actor-undergoer hierarchy** [**AUH**] (46) and the **macrorole assignment principles** [**MAP**] (47):

(46) Actor-Undergoer Hierarchy [AUH]

Actor ----------> Undergoer
<----------

Arg. of DO	Arg. of **do'** (x,…)	1st Arg. of **pred'** (x, y)	2nd Arg. of **pred'** (x, y)	Arg. of state **pred'** (x)
Agent	Effector	Locative Experiencer	Theme	Patient

["----->" = increasing markedness of realization of thematic relation as macrorole]

(47) Macrorole Assignment Principles [MAP]

a. Number: the number of macroroles which a verb takes

1. If a verb has two or more arguments in its LS, it will take two macroroles, actor and undergoer.
2. If a verb has one argument in its LS, it will take one macrorole.

b. Nature: for verbs which take one macrorole,

1. If the verb has an activity predicate in its LS, the macrorole is actor.
2. If the verb has no activity predicate in its LS, the macrorole is undergoer.

(46) determines how to rank actor and undergoer with respect to each other. It states that given the LS of a verb, the argument bearing the thematic relation which appears leftmost on the cline will be chosen as the actor and the argument bearing the thematic relation which appears rightmost on it will be selected as the undergoer. Although the prototypical actor is an agent, whereas the prototypical undergoer is a patient, effectors, experiencers, and locatives can also be actors, while locatives and themes can also serve as undergoer, as illustrated in (48)-(49):

(48) a. John [effector-actor] dropped the vase accidentally.
b. John [experiencer-actor] loved his mother.
c. John [locative-actor] had a lot of friends in college.
(49) a. Mary angered John [experiencer-undergoer] by her attitude.
b. Mary loaded the lorry [locative-undergoer] with bricks.
c. Mary borrowed the magazine [theme-undergoer] from John.

Locative and experiencer may act as either actor, undergoer, or non-macrorole, since they are at the middle of the hierarchy (46).

(50) a. Mary gave John [locative-non-macrorole] the magazine.
b. John put the newspapers in the box [locative-non-macrorole]

(47a) is concerned with the number of macroroles which a verb may take. This is largely predictable from its LS; there are only three possibilities: 0, 1, 2. If a verb has two or three arguments in its LS, e.g. [**do'** (x, ø)] CAUSE [INGR **have'** (y, z)], **admire'** (x, y), [**do'** (x, ø)] CAUSE [INGR **hit'** (y)], the unmarked situation is for it to receive two macroroles, actor and undergoer. If a verb has only one argument in its **LS**, e.g. **do'** (x, [**walk'** (x)]), BECOME **broken'** (x), it typically receives one macrorole. If the verb has an activity predicate in its LS, the macrorole has to be an actor; otherwise, it should be an undergoer. Verbs with no LS argument, e.g. **snow'**, **rain'**, have no macrorole.

(47a) is violable, in that it is possible for a two-place verbs to receive only one macrorole. It is also possible for one-place or two-place verbs to have no macrorole at all. If the number of macroroles does not follow from (47), it would have to be specified in the

lexical entry of the verb. [1MR] means that there is one macrorole, while [0MR] (e.g. *seem*) means that there is no macrorole to assign. Here are a few examples from English:

(51) a. The cat was lying on the mat.
b. John seemed to be working in the backyard.
c. Mary talked to the captain.
d. This book belongs to Tom.

Intransitive verbs with two LS arguments such as *lie*, *talk*, and *belong* have only one macrorole, an undergoer with *lie* and *belong* and an actor with *walk*. The only information that has to be listed in the lexical entries of those English verbs is [1MR]. *Belong* is in contrast to *have*, which follows (47a) strictly and licenses both actor and undergoer. These features in the lexical entry of a verb indicate that the default principles in (47a) are overridden. English subject-to-subject raising verbs such as *seem* and *appear* take no macrorole and have the feature [0MR] in their lexical entries. The nature of the macrorole does not have to be stipulated, however. The choice of undergoers for *lie* and *belong* falls out of (47b2), while the choice of actor for *talk* follows from (47b1).

The choice of actor always follows (46) because of (47a1) and (47b1), while the choice of undergoer does not necessarily do so. This is illustrated by (52)-(54), with undergoers italicized:

(52) a. John loaded *bricks* [theme-undergoer] onto the lorry.
b. John loaded *the lorry* [locative-undergoer] with bricks.
c. *The lorry* was loaded with bricks.
d. *The lorry* was easy to load with bricks.
(53) a. John provided *food and water* for Mary.
b. John provided *Mary* with food and water.
c. *Mary* was provided with food and water.
d. *Mary* was easy to provide with food and water.
(54) a. John empties *the water* from the tank.
b. John empties *the tank* of the water.
c. *The tank* was emptied of the water.
d. *The tank* was easy to empty of the water.

(52a)-(54a) follow (46) and (47) and involve the canonical linking. In contrast, locatives outranks themes for undergoer status in (52b)-(53b). (52c,d)-(54c,d) provide evidence that the locatives serve as undergoer in (52b)-(54b), since passivization and "tough" movement apply normally to undergoers only (Farrell 1994, Foley and Van Valin 1984). It is

important to notice that this marked linking, which is responsible for the holistic effect associated with (52b), is still licensed by (47), since it has two macroroles, actor and undergoer, and assigns the actor status to the thematic relation which is ranked the highest with respect to the actor end of AUH.

The number of macroroles which a verb receives corresponds closely to the characterization of a verb in terms of the traditional notion of transitivity: single macrorole verbs are intransitive, two macrorole verbs are transitive. The traditional notion refers to a number of arguments that appear in the syntax, and this corresponds to the number of core arguments. It is necessary, then, to distinguish semantic transitivity, which refers to the number of macroroles, from syntactic transitivity, which refers to the number of core arguments. The number of core arguments does not have to be the same as that of macroroles (Van Valin 1991; see also Michaelis 1993 and Yang 1994). Throughout this work, the term transitivity should be understood as semantic transitivity or **M-transitivity** (Narasimhan 1995), and not as the number of syntactic arguments:

(55) Transitivity in terms of Macroroles (M-transitivity)

a.	Transitive	2 Macroroles
b.	*In*transitive	1 Macrorole
c.	*A*transitive	0 Macrorole

Finally, let us devote some space to examining a semantic analysis of two-place activity verbs by Van Valin and LaPolla (in press: Ch.3). Their claim is that two-place activity verbs such as *eat, drink,* and *watch* involve the following macrorole assignment:

(56) The second argument of a two-place activity predicate is necessarily nonreferential and therefore takes a non-macrorole value in violation of MAP, according to which a verb with two LS arguments normally gets two macroroles, actor and undergoer.

For example, a verb *watch* is analyzed in the manner of (57b):

(57) a. John watched the movie for an hour.

b.

LS		**do'** (John, [**see'** (John,	movie)])
Thematic Relation	Effector		Locus
Macrorole	Actor		Non-MR

Van Valin and LaPolla regard this irregular macrorole assignment as a crucial piece of evidence for a mismatch between semantic and syntactic transitivity. These activity verbs are taken to be transitive syntactically, but intransitive semantically. Although I am fully convinced that a mismatch between these two types of transitivity plays an important role in grammar (see Ch.4), I argue that there is no merit in maintaining (56). (58) is my proposal:

(58) A two-place activity verb takes two macroroles, actor and undergoer, in full accordance with MAP (47).

(58) has an obvious merit of accounting for the case assignment in the following Japanese examples with no modification, since all the objects in (59a)-(59d) receive accusative case:

(59) a. Taroo-ga Eigo-o iti-jikan benkyoo-si-ta.
Taro-NOM English one-hour study-do-PAST
'Taro studied English for an hour'.

b. Taroo-ga hon-o iti-jikan yon-da.
Taro-NOM book-ACC one-hour read-PAST
'Taro read a book for an hour'.

c. Taroo-ga TV-o san-jikan mi-ta.
Taro-NOM TV-ACC three-hour watch-PAST
'Taro watched TV for three hours'.

d. Taroo-ga biiru-o iti-jikan non-da.
Taro-NOM beer-ACC one-hour drink-PAST
'Taro drank beer for an hour'.

(59a)-(59d) contain activity verbs. (56) makes an incorrect prediction that all of the objects in (59a)-(59d) should receive dative (or other oblique) case. In order to maintain (56), Van Valin and LaPolla (in press: Ch.3) would have to make the following extra stipulation:

(60) The second argument of a two-place activity verb receives accusative case even when they are non-macrorole arguments.[15]

In contrast, (58) has no problem in handling (59a)-(59d).

Given this initial assessment, it is necessary for Van Valin and LaPolla (in press) to come up with very strong evidence for (56) which would render it worthwhile to allow MAP to be violated. Van Valin and LaPolla (in press: Ch.3) argue that the second argument of an activity verb is not an undergoer, but rather a non-macrorole, for the following two reasons:

(61) a. It does not undergo passivization, which applies only to undergoers.
b. Those two-place activity verbs do not occur in participial absolute constructions, in which any verb with an undergoer may occur.

I focus on these two syntactic constructions in Italian and show that their proper analyses do not require (56) at all.

Let us start with participial absolute constructions in Italian. Van Valin and LaPolla cite the following pair in support of (56):

(62) a. Mangia-t-i gli spaghetti, uscir-ono.
eat-PSTP-MASC:PL the spaghetti go.out:PAST-3PL
'Having eaten the spaghetti, they went out'.

b. *Mangiati spaghetti, uscir-ono.
eat:PSTP:MASC:PL spaghetti go.out:PAST-3PL
'Having eaten spaghetti, they went out'.

(62a) is an active accomplishment, while (62b) is an activity. Under the assumption that a participial absolute in Italian consists of a verb in participial form which is accompanied by its undergoer (see Cresti 1990 for a RelG account of Italian psych verbs), they argue that since there is no reason to expect the two-place activity verb *mangiare* 'eat' to behave differently from the corresponding active accomplishment form, it is reasonable to attribute this contrast to the non-macrorole status of *spaghetti* in (62b). However, their argument is called into question by the fact that causative psych verbs such as *preoccupare* 'worry' also do not occur in participial absolute constructions, as demonstrated by (63a) (Cresti 1990: 64):

(63) a. *Preoccupata la mamma, Gianni
worry:PSTP:MASC:SG his mother Gianni

tentave di rassicurarla.
try:PAST:3SG to reassure:her

'Having worried his mother, Gianni tried to reassure her'.

b. Temute le ripercussioni di questo atto,
fear:PSTP:1PL the repercussions of this act

decidemmo di convocare un'assemblea.
decide:PAST:1PL to call an assembly.

'Having feared the repercussions of this act, we decided to call an assembly'.

The LSs of the Italian verbs *mangiare* 'eat', *preoccupare* 'worry', and *temere* 'fear' are given in (64a)-(64c), respectively:

(64) a. *preoccupare* [**do'** (Gianni, ø)] CAUSE [**fear'** (his mother, Gianni)]
b. *mangiare* **do'** (they, [**eat'** (they, spaghetti)])
c. *temere* **fear'** (we, repercussion)

It is not difficult to see that what sets (64c) apart from (64a,b) is that undegoer is associated with the lowest-ranking argument of a state predicate (i.e. theme and patient) in (64c), but not in (64a) or (64b). The correct generalization is something like (65):

(65) Participial Absolutes in Italian
A participial absolute consists of a verb in participial form accompanied by its undergoer which is associated with the lowest-ranking argument (in terms of AUH) of the state predicate in the LS of the verb.

(65) correctly predicts that unaccusative predicates, but not unergative ones, may occur in this construction (Cresti 1990). The foregoing discussion shows that the contrast between (62a) and (62b) is explainable without appealing to (56).

Another syntactic evidence Van Valin and LaPolla provide in support of (56) is that activity verbs in Italian do not undergo passivization, while the corresponding active accomplishment verbs do so. They see this contrast as evidence that the second argument of an activity verb is not an undergoer, but a non-macrorole core argument, under the assumption that undergoers may undergo passivization in Italian. (66a) and (67a) contain an activity and active accomplishment verb, while (66b) and (67b) are the passive counterparts of (66a) and (67a) respectively:

(66) a. Anna ha mangia-to spaghetti per cinque
Anna have:3SG:PRES eat-PSTP spaghetti for five
minuti.
minutes

'Anna ate spaghetti for five minutes'.

b. *Spaghetti sono stat-i mangia-t-i
spaghetti be:3PL:PRES be:PSTP-MASC:PL eat-PSTP-MASC:PL
da Anna per cinque minuti.
by Anna for five minutes

'Spaghetti was eaten by Anna for five minutes'.

(67) a. Anna ha mangia-to gli spaghetti in
Anna have:3SG:PRES eat-PSTP the spaghetti in

cinque minuti.
five minutes

'Anna ate the spaghetti in five minutes'.

b. Gli spaghetti sono stat-i
the spaghetti be:3PL:PRES be:PSTP-MASC:PL

mangia-t-i da Anna in cinque minuti.
eat-PSTP-MASC:PL by Anna in five minutes

'The spaghetti was eaten by Anna in five minutes'.

Van Valin and LaPolla attribute the ungrammaticality of (66b) to the non-macrorole status of *spaghetti* in (66a). The question, then, is whether or not we can capture the contrast between (66b) and (67b) without appealing to (56). The answer is yes. An alternative account would be something like (68):

(68) Passivization may not apply to undergoers which are the second arguments of activity verbs in Italian.

(68) shows that the contrast between (66b) and (67b) does not require (56) at all.

To sum up, there is no evidence for (56) that makes it worthwhile to allow MAP to be violated and make the extra assumption (60). This leads us to conclude, contrary to Van Valin and LaPolla (in press), that two-place activity verbs require no special treatment; they take both actor and undergoer in accordance with (47a1).[16]

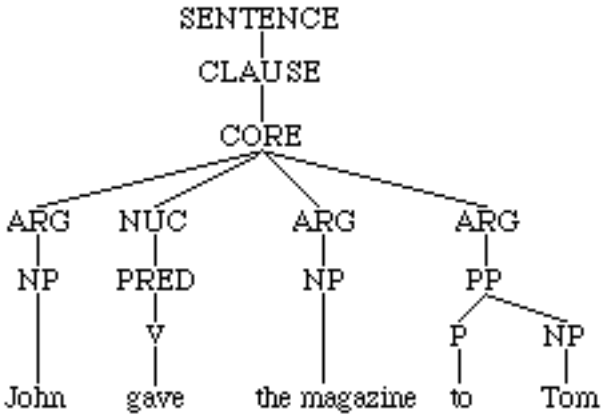
2.3.5.2 Adjuncts

I have just presented a system of lexical decomposition which yields a semantic representation of the core of the clause, i.e. for the predicate in the nucleus and its core argument(s). In what follows, I will show how adjuncts may be represented semantically. There are two types of adjuncts, peripheral PPs and adverbs. I will concentrate on the treatment of PPs and refer the reader to Van Valin and LaPolla (in press: Ch.4) for semantic representations of adverbs.

Van Valin and LaPolla adopt Jolly's (1993) three-way typology of prepositions: 1. argument-marking prepositions; 2. adjunct prepositions, which are predicates in their own right; and 3. argument-adjunct [AAJ] prepositions, which are defined as "predicates in their own right which introduce an argument into the clause and share it with the LS of the core, rather than taking the LS of the core as an argument".

Argument-marking prepositions are best illustrated by *to* with *give*:

Figure 16: Syntactic Representation of Argument-Marking Non-Predicative Preposition



As shown in Figure 16, the preposition *to* is not represented as a predicate, but rather as simply marking the third argument of *give*. The semantics of its argument is entirely a function of the semantics of the verb in the nucleus.

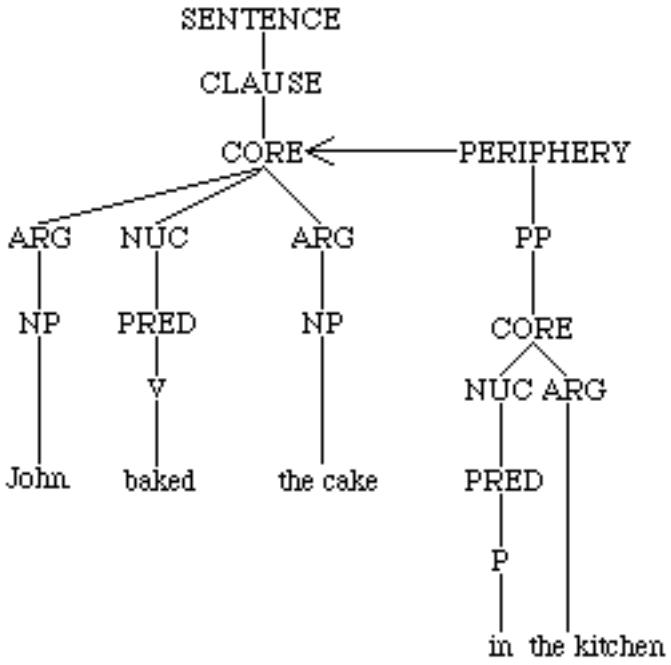
The prepositions in peripheral PP adjuncts are always predicative, since they do not mark subcategorized arguments of the verb. Because they modify the core as a whole, they take the whole LS of the verb of the clause as one of their arguments. This is illustrated by (69)-(70):

(69) a. John baked the cake *in the kitchen.*
b. **be-in'** (kitchen, [[**do'** (John, ø)] CAUSE [BECOME **baked'** (cake)]])

(70) a. John baked the cake *after work.*
b. **be-after'** (work, [[**do'** (John, ø)] CAUSE [BECOME **baked'** (cake)]])

In both (69b) and (70b) the LS of the event is treated as an entity being located with respect to a spatial or temporal reference point. Figure 17 diagrams the constituent structure of (69a):

Figure 17: Syntactic Representation of Adjunct Predicative Preposition



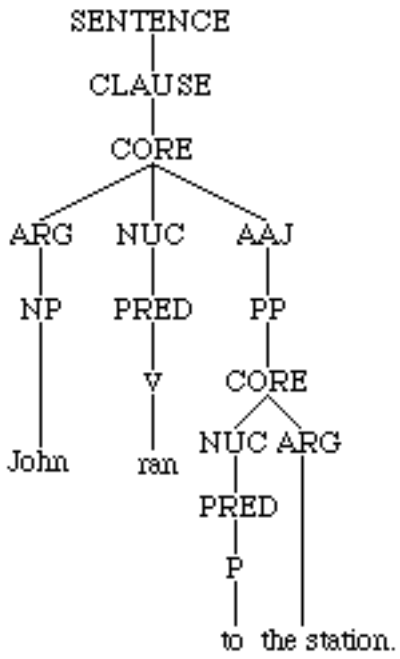
AAJ prepositions provide the interesting intermediate case between argument-marking and adjunct prepositions. They are predicates, but they introduce core arguments of verbs, rather than modifiers of the whole core. They are illustrated by *to* with motion verbs such as *walk* and *run*:

(71) a. John ran yesterday.
b. **do'** (John, [**run'** (John)])

(72) a. John ran *to the station*.
b. **do'** (John, [**run'** (John)]) & BECOME **be-at'** (station, John)

The preposition *to* in (72a) introduces the LS of its own ('BECOME **be-at'** (station, John)') and thus is distinguished from the argument-marking preposition *to* in Figure 16. An AAJ preposition differs from an argument-marking preposition, in that the meaning of its argument is not derived from the LS of the verb, and from an adjunct preposition in that it does not take a LS as one of its arguments. Rather, it shares an argument with the LS of the verb. In (72), *John* is not only the argument of the verb *run*, but serves as the second argument of the preposition *to*. It is this shared argument which is the defining feature of an AAJ preposition. The constituent structure of (72a) is given in Figure 18:

Figure 18: Syntactic Representation of Argument-Adjunct Predicative Preposition



There may be more than one AAJ PP with some verbs. An example is provided in (73a), whose LS is given in (73b). Both *from his office* and *to the store* in (73a) are AAJ PPs:

(73) a. John ran from his office to the store.
b. [**do'** (John, [**run'** (John)])] & [BECOME NOT **be-at'** (his office, John)]
& [BECOME **be-at'** (station, John)]

Finally, it may be useful to have a look at a single preposition which has all the three uses, in order to see clearly how they are related. Consider (74a)-(74c):

(74) a. John hoped *for a car*. Argument-marking
b. John baked the cake *for Mary.* Argument-adjunct
c. John worked *for his family*. Adjunct

Van Valin and LaPolla (in press: Ch.7) follow Jolly (1993) in postulating the following semantic representation of *for*:

(75) **want'** (x, LS_2) & DO (x, [LS_1 ... CAUSE ... LS_2])

The import of (75) is that the participant denoted by 'x' in (75) wants some state of affairs (LS_2) to obtain and intentionally does LS_1 in order to bring about LS_2. The operator 'DO' plays a very important role here, since it is impossible for the action in LS_1 to be non-volitional, as demonstrated by (76a,b):

(76) a. *John knows Greek *for mental exercise*.
b. *Rita found a fifty-mark note *for fun*.

Only verbs of hope or desire take *for* as an argument marker. For the argument-marking use of *for*, only the first part of (75) is relevant. A closer look at (74a) reveals that the object of *for* is a reduced proposition semantically. That is, (74a) means that John hoped that he would get a car. The LS of (74a) is something like (77):

(77) **want'** (John, [BECOME **have'** (John, car)])

(77) shows that the first half of (75) suffices for licensing the argument-marking preposition *for*. We may now characterize *for* as marking the second argument of **have'** in LSs such as (77).

The argument-adjunct use of *for* involves the whole LS in (75). The complete representation of (74b) is given in (78):

(78) [**want'** (John, [BECOME **have'** (Mary, cake)])] & [[DO (John, [**do'** (John, Ø) CAUSE [BECOME **baked'** (cake)]] CAUSE [BECOME **have'** (Mary, cake)])]]

'LS_1' in (75) corresponds to the whole LS of the verb *bake*, whereas 'LS_2' corresponds to '[BECOME **have'** (Mary, cake)]'. (74b) involves the argument-adjunct use of *for*, since the LS of *for* shares an argument *cake* with the LS of the verb *bake*.[17, 18]

The adjunct use of *for* also involves the whole LS in (75). The full semantic representation of (74c) is given in (79):

(79) [**want'** (John, [BECOME **have'** (students, Ø)])] & [[DO (John, [**do'** (John, [**sing'** (John)])])]]

The difference between (78) and (79) comes down to whether the LS of *for* shares an argument with the LS of the verb. (79) does not. The second argument of **have'** is left underspecified in (79) and is filled in on the basis of contextual information.

2.3.6 Semantic/Syntactic Pivot

The vast majority of languages provide evidence for the postulation of syntactic functions in addition to semantic roles, thematic relations and macroroles. The traditional description of syntactic phenomena is in terms of a set of grammatical relations, but the

investigation of Austronesian languages including Tagalog (Schachter and Otanes 1972, Schachter 1976), Acehnese (Durie 1985, 1987), and Balinese (Artawa and Blake 1994) has amply demonstrated that analyses based on the traditional concept of grammatical relations alone are highly problematic.[19]

RRG takes a different view of grammatical relations, i.e. subjects, direct objects, and indirect objects, from other theories in four respects:

(80) a. Grammatical relations are neither primitives (unlike RG and HPSG) nor derived from structural configurations (unlike GB).

b. Only subjects are recognized as grammatical relations; RRG has nothing corresponding to direct objects or indirect objects.

c. Grammatical relations are not universal; there are languages such as Acehnese (Durie 1985, 1987) which do not require us to postulate grammatical relations.

d. Subjects are not the only controller of syntactic processes.

RRG preserves the term **pivot** as an umbrella term for all sorts of controllers of syntactic processes, e.g. reflexivization, agreement, control, relativization, coordination, raising, and distinguishes it from subject in the narrow sense (or **syntactic pivot**).[20]

(80a,b) beg a question of how RRG characterizes subjects. Van Valin (1993: 56) describes the RRG view of subject as follows.

> In all languages there are syntactic constructions in which there are restrictions on which NPs and AdPs (arguments and non-arguments) can be involved in them; these restrictions define a privileged syntagmatic function with respect to that construction... In languages like English, Dyirbal, and Lakhota, on the other hand, there is a restricted neutralization of semantic roles with respect to the privileged syntagmatic function in most syntactic constructions...

The NP which involves a restricted neutralization is what has traditionally been termed subject. The essential idea is that in order for a subject to exist, there has to be a restricted neutralization of semantic roles associated with the privileged function in the construction.

To illustrate a restricted neutralization, consider (81) and (82):

(81) a. Susan wants to run in the park.
b. Susan wants to be taller.
c. Susan wants to eat a hot dog.
d. *Susan$_i$ doesn't want the panhandler to accost ___$_i$
e. Susan doesn't want to be accosted by a panhandler.

(82) a. Jack seems to be running in the park.
b. Jack seems to be taller.
c. Jack seems to be eating a hot dog.
d. *Jack$_i$ seems the panhandler to have accosted ____$_i$
e. Jack seems to have been accosted by a panhandler.

(81) and (82) display a restricted neutralization with respect to the omitted argument in (81) (equi-NP deletion) and with respect to the argument in a core with a nucleus of which it is not an argument in (82) (subject-to-subject raising). There is a missing argument in the dependent core in (81), while in (82) an argument of the dependent verb appears in the matrix core; hence in (81) the privileged syntagmatic function defining the construction is that of the missing argument, while in (82) it is that of the "raised" argument. In (81) and (82), there are restrictions on which arguments may be omitted or "raised", as shown by (81d) and (82d). The missing argument in the dependent core in (81a,c) is an actor, in (81b,e) an undergoer, and likewise the "raised" argument is an actor in (82a,c), an undergoer in (82b,e). In (81d) and (82d), the missing or "raised" arguments have the same semantic role as in the corresponding grammatical examples (81e) and (82e). This is a crucial piece of evidence that the restriction may not be stated in terms of semantic roles, thematic relation or macrorole. There is, thus, a restricted neutralization with respect to the omitted NP in (81) and the "raised" NP in (82), which correspond to the traditional subject.

RRG allows two types of semantic pivots in addition to syntactic pivots, which correspond to subjects in traditional terms. First, RRG defines syntactic accusativity and ergativity in terms of the relative ranking of actor and undergoer, as shown in (83):

(83) a. Hierarchy of markedness of pivot choice: syntactically accusative
Actor > Undergoer

b. Hierarchy of markedness of pivot choice: syntactically ergative
Undergoer > Actor

(83a,b) apply to core arguments alone. There is no relative ranking of actor and undergoer in languages such as Acehnese which exhibit no restricted neutralization. (83a,b) apply to each construction, since some languages, e.g. Jacaltec (Mayan: Craig 1977), Yaghnobi (Iranian: Comrie 1981b), have both accusative constructions and ergative constructions.

Finite verb agreement in Icelandic is sensitive to the relative ranking of actor and undergoer. Consider the following examples (Van Valin and LaPolla in press: Ch.7):

(84) a. Lögregl-a-n tók Sigg-u fast-a.
police-SG:NOM-the take:3SG:PAST Sigga-ACC fast-SG:ACC
'The police arrested Sigga'.

b. Sigg-a va-r tek-in föst
Sigga-SG:NOM be:PAST-3SG take:PSTP-NOM fast:NOM

af lögregl-un-ni.
by police-the-SG:DAT

'Sigga was arrested by the police'.

c. Ég hjálpa-ð-i peim.
1SG:NOM help-PAST-1SG 3PL:DAT
'I helped them'.

d. Peim va-r hjálpa-að af mér.
3PL:DAT be:PAST-3SG help-PSTP by 1SG:DAT
'They were helped by me'.

e. Peim hef-ur alltaf pótt
3PL:DAT have:3SG:PRES always think:PSTP

Olaf-ur leð-inleg-ur.
Olaf-SG:NOM boring-SG:NOM

'They have always considered Olaf boring'.

A look at (84a)-(84e) suggests that only nominative-marked core macroroles can control verb agreement in Icelandic (cf. Zaenen et al. 1985). Similar facts lead Van Valin (1991) to propose (85), which refers crucially to (83a):

(85) Finite Verb Agreement in Icelandic
Highest ranking core macrorole controls verb agreement in Icelandic.

Second, RRG also allows those semantic pivots which are sensitive to the relative ranking of thematic relations. Consider the following Japanese examples, which may not be captured with reference to the relative ranking of actor and undergoer in (83):

(86) a. Warai-nagara, John-ga Tom-o korosi-ta.
smile-while John-NOM Tom-ACC kill-PAST
'While laughing, John killed Tom'.

b. Hasiri-nagara, John-ga tegami-o yon-da.
run-while John-NOM letter-ACC read-PAST
'While running, John read a letter'.

c. Warai-nagara, John-ga ana-ni oti-ta.
laugh-while John-NOM hole-DAT fall-PAST
'While laughing, John fell into a hole'.

d. Boston-de umare-nagara, Hanako-ni-wa
Boston-INSTR be.born-while Hanako-DAT-TOP

eigo-ga hanas-e-nai.
English-NOM speak-can-NEG

'Although born in Boston, Hanako cannot speak English'.

(86d) does not fall under (83a), since the controller in (86d) is a non-macrorole argument. The generalization which emerges from these examples is given in (87):

(87) Condition on Controllers of the *nagara* Construction [21]
The highest-ranking thematic relation may control an unexpressed subject [= PRO] in a *nagara* clause.

(87) is subject to the condition that controllers have to be in the core and subcategorized by verbs. (87) extends to honorific agreement in Japanese, which is illustrated by (88a)-(88d), with no modification:

(88) a. Yamada-san-ga hon-o yuusoo-nasat-ta.
Yamada-Mr.-NOM book-ACC mail-do:HON-PAST
'Mr. Yamada mailed a book'.

b. Yamada-san-ga watasi-no kaisha-ni irasshat-ta.
Yamada-Mr.-NOM I-GEN office-DAT come.over-PAST
'Mr. Yamada came over to MY office'.

c. Yamada-san-ni-wa eigo-ga o-wakari-da.
Yamada-Mr.-DAT-TOP English-NOM HON-understand-be
'Mr. Yamada understands English'.

d. Yamada$_i$-san-ga Tanaka$_j$-san-ni
Yamada-Mr.-NOM Tanaka-Mr.-DAT

o$_{i/*j}$-nagur-are-ni-nat-ta.
HON-hit-PASS-DAT-become-PAST

'My. Yamada was hit by Mr. Tanaka'.

(89) Condition on Controllers of the Honorific Agreement
The highest-ranking thematic relation may control a honorific agreement.

Semantic pivots as defined in (87) and (89) are termed **controllers** in Van Valin and LaPolla (in press). From this, we may see that RRG allows three types of pivots: syntactic pivots (subject) and the two types of semantic pivots. (90) provides a summary of them:

(90) Three Types of Pivots

a. Syntactic Pivots (Subjects)
e.g. raising in Icelandic

b. Semantic Pivots (1)
e.g. verb agreement in Icelandic

c. Semantic Pivots (2) (Controllers)
e.g. honorific agreement in Japanese

This division has gained some ground in both GB and LFG literature. It may be helpful to compare these three types of pivots available in RRG with those corresponding to them in Guilfoyle et al. (1992) (GB) and Manning (1996) (LFG):

(91)

RRG	Guilfoyle et al. (1992)	Manning (1996) [22, 23]
Syntactic Pivots	Spec of IP	Subject
Semantic Pivots (1)	Ø	Ø
Semantic Pivots (2)	Spec of VP	A-Subject

Since there are a few languages with no syntactic pivot, e.g. Acehnese (Durie 1985), we may safely say that semantic pivots are unmarked pivot types and that every language which has syntactic pivots has at least one construction which has semantic pivot. This three-way typology of pivots goes a long way toward describing mixed-pivot phenomena.

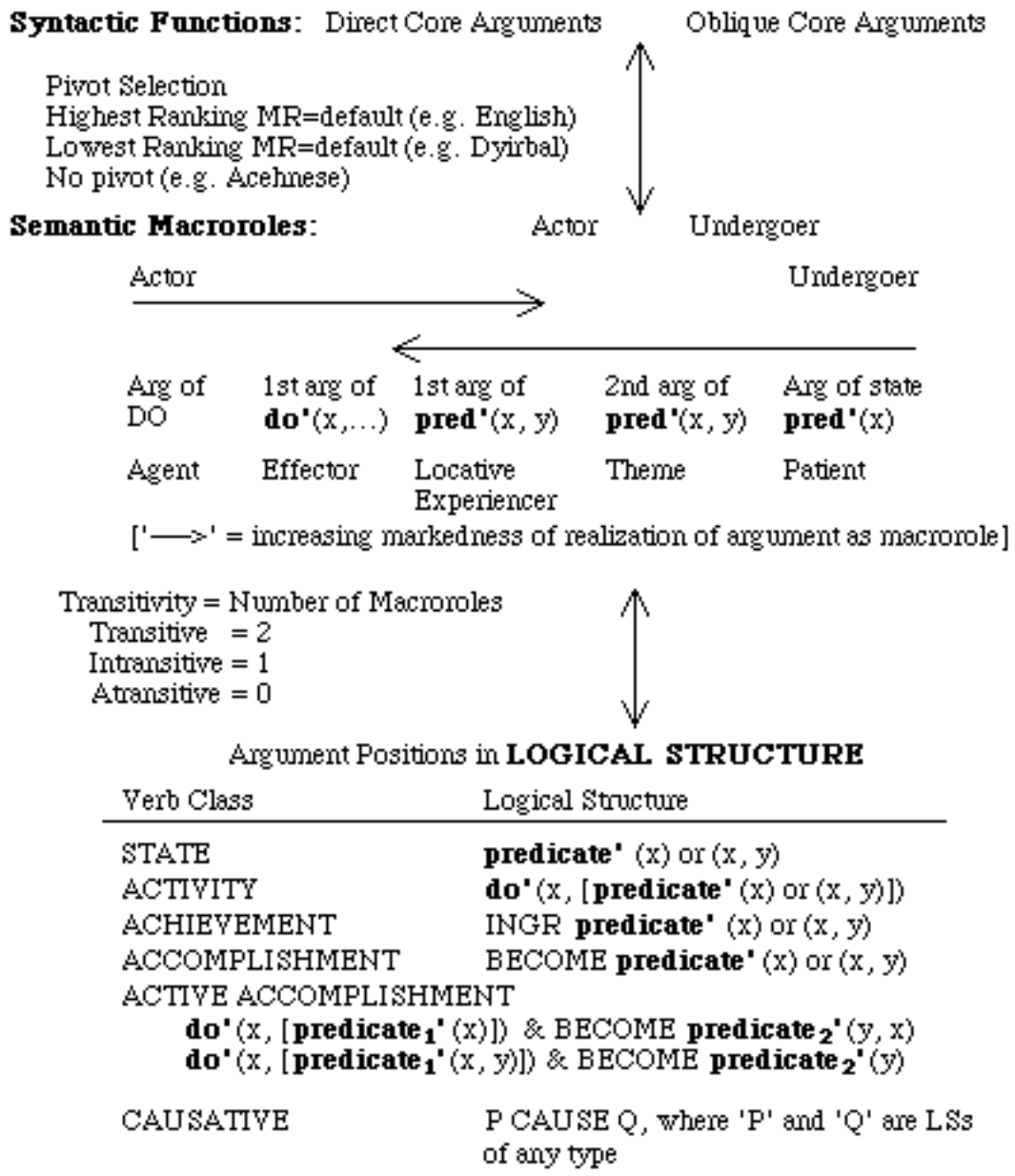
2.3.7 The Syntax-Semantics Interface

2.3.7.1 General Considerations

We are now ready to present a set of linking principles which governs the syntax-semantics interface, since the syntactic component (i.e. constituent structure and syntactic functions) and the semantic component of grammar have been introduced earlier in this chapter. The set of linking principles plays a crucial role in a monostratal theory such as RRG, since it must be able to handle not only canonical clause patterns, i.e. those in which the default association between syntactic and semantic structure holds, but non-canonical patterns (e.g. a variety of raising constructions), which have provided strong motivations for multistratal approaches to syntax such as GB and RelG.

Figure 19 describes the linking schema assumed in RRG:

Figure 19: General Linking Schema



The association between LSs and thematic relations is given in the definitions of thematic relations in terms of LS argument positions. It is lexical in nature and constrained by AUH (46) and MAP (47). On the other hand, the linking between macroroles (and non-macrorole core argument(s) of the verb) and pivots is syntactic in nature and subject to extensive typological variation as indicated in (82).

The association between semantic and syntactic representation is governed by (92), a rough analog of GB's **Projection Principle**:

(92) **Completeness Constraint** [**CC**]
All of the arguments explicitly specified in the semantic representation of a sentence must be realized syntactically in the sentence, and all of the non-predicate elements in the syntactic representation of a sentence must be linked to an argument position in a logical structure in the semantic representation of the sentence.

The CC captures the intuition that in order for an element in the syntax to be interpreted, it must be tied to something in the semantic representation, while all of the material in the semantic representation must be expressed in some way in the overt form of the sentence; otherwise the interpretation of the syntactic representation would not correspond to the meaning of the semantic representation to which it is linked.

The working of CC may be made clear by the following examples:

(93) a. John drank beer.
b. John drank.
c. **do'** (John, [**drink'** (John, beer)]
d. **do'** (John, [**drink'** (John, ø)]

(94) a. Mary loaded the truck with books.
b. Mary loaded the truck.
c. [**do'** (Mary, ø)] CAUSE [BECOME **be-in'** (truck, books)]
d. [**do'** (Mary, ø)] CAUSE [BECOME **be-in'** (truck, ø)]

'Ø' in (93d) and (94d) shows that the argument in question is unspecified; it cannot therefore be linked to any element in constituent structure. In accordance with the CC, (93c) may be the LS for (93a) and (93d) for (93b), but not vice versa. That is, (93a) cannot be linked to (93d), since the NP *beer* cannot be linked to the unspecified argument position; since it cannot be linked to a position in the LS, it cannot be interpreted. Likewise, (93c) cannot be the LS for (93b), since the NP *beer* in the LS is not realized overtly in constituent structure. The same argument holds for (94). In simple sentences, (92) makes sure that there is a match between the number of arguments in the clause and in the LS of the verb. As will be shown later in this section, (92) plays a very important role in the linking not only of simple sentences, but also of complex sentences, in particular control and raising constructions.

2.3.7.2 Linking in Simple Sentences

The linking between lexical semantics (LSs of verbs) and syntax (constituent structure) is summarized in a simplified form in (95):

(95) Linking from Logical Structure to Constituent Structure (Preliminary)

1. Determine actor/undergoer assignments on the basis of AUH and MAP.

2. Assign actor and undergoer to specific morphosyntactic statuses, e.g. case, agreement, word order (language-specific).

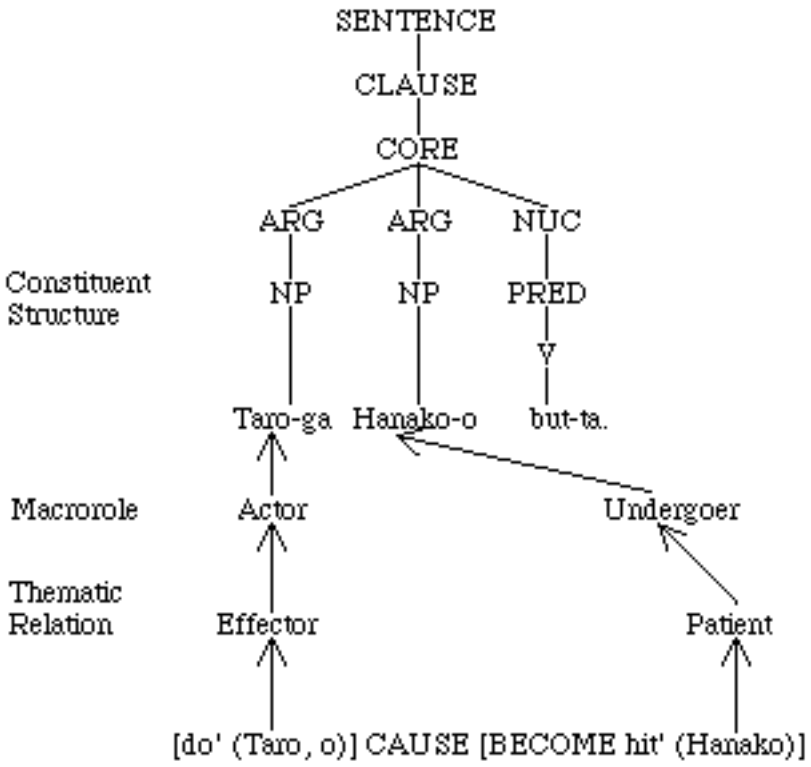
   a. Accusative pivot hierarchy (82a): Actor > Undergoer
   b. Ergative pivot hierarchy (82b): Undergoer > Actor
   c. No pivot hierarchy (e.g. Acehnese)

3. Assign the remaining core arguments their appropriate case markers or adpositions.

In order to see how (95) works, consider a Japanese example (68), whose linking between lexical semantics and syntax is presented in Figure 20:

(96) Taroo-ga Hanako-o but-ta.
Taro-NOM Hanako-ACC hit-PAST
'Taro hit Hanako'.

Figure 20: Linking between Lexical Semantics and Syntax in (96)



In (96), the first argument of '**do'** (x, ø)' is associated with actor, while the argument of a state predicate '**hit'** (x)' is associated with undergoer. This linking follows AUH, since effector is ranked higher than patient on AUH. It also satisfies MAP, since the verb *butsu* 'hit' has two LS arguments, effector and patient, and is assigned two macroroles, actor and undergoer.

Korean examples (97a,b) illustrate an irregular linking between thematic relations and macroroles:

(97) a. John-i sikthak-ey sikthakpo-lul tep-ess-ta.
John-NOM table-DAT table.cloth-ACC cover-PAST-DEC
'John put the table cloth on the table'.

b. John-i sikthak-ul sikthakpo-lo tep-ess-ta.
John-NOM table-ACC table.cloth-with cover-PAST-DEC
'John covered the table with the table cloth'.

Analogous examples are found in many languages including English:

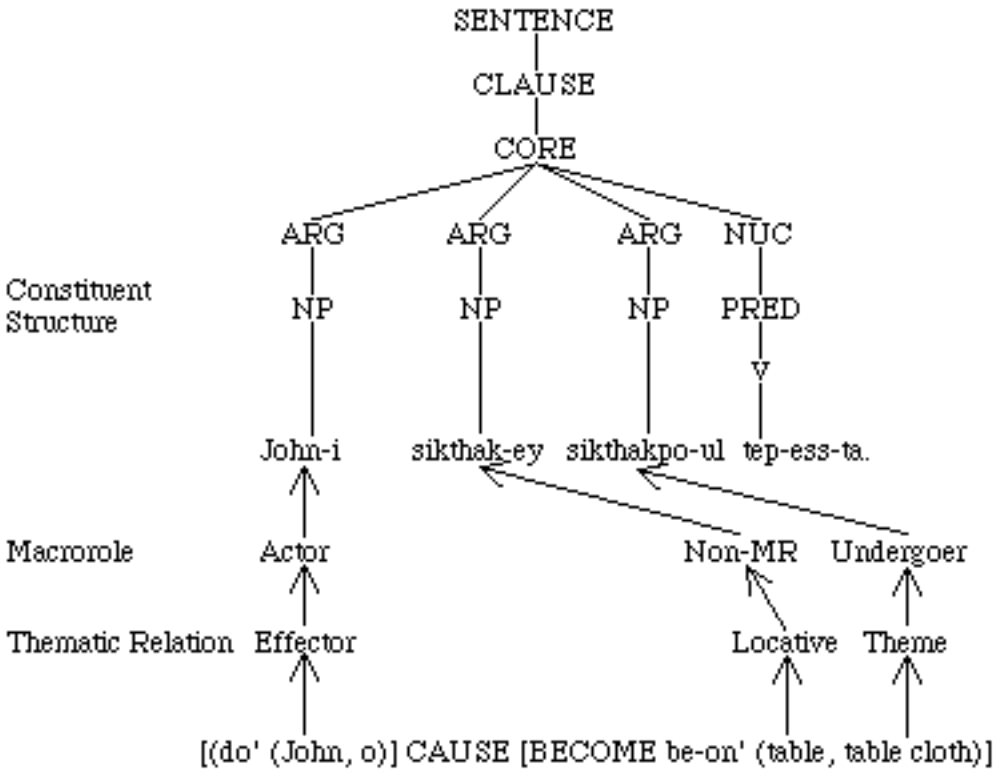
(98) a. John loaded hay on the truck.
b. John loaded the truck with hay.

These constructions are irregular, in that they do not associate the lowest-ranking thematic relation with undergoer. (97a) and (97b), both of which exhibit the locative alternation, arise from the same LS given in (99):

(99) *tep-ta* 'cover': [**do'** (John, Ø)] CAUSE [BECOME **be-on'** (table, table cloth)]

Figures 21 (a) and 21 (b) describe the linking between lexical semantics and syntax in (97a) and (97b), respectively:

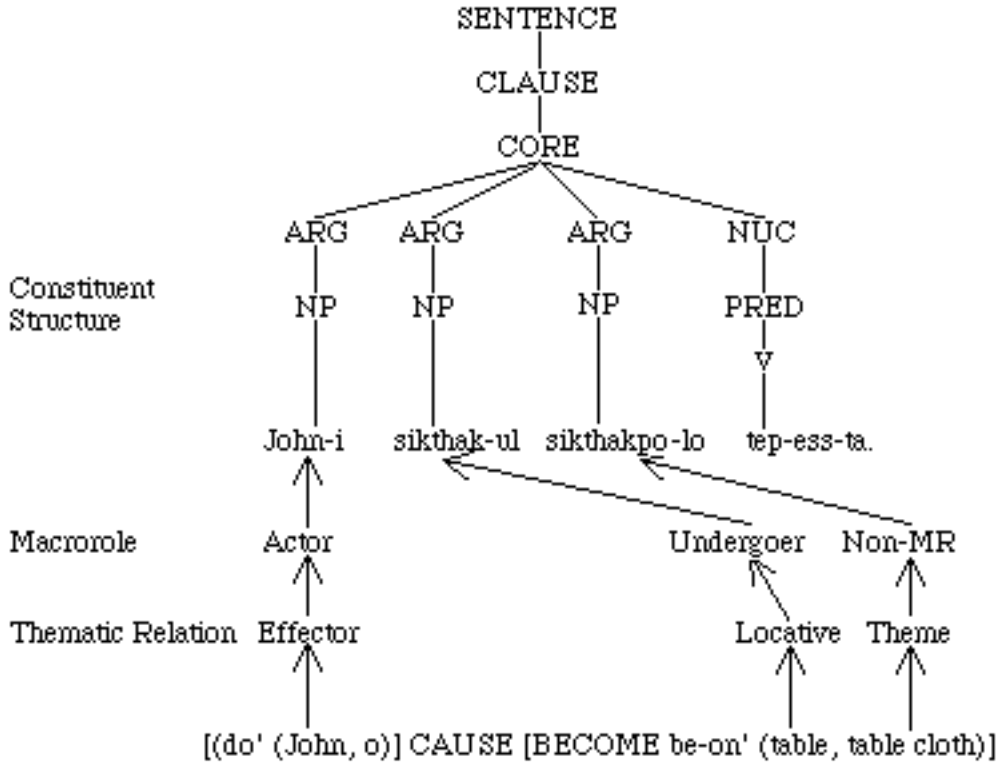
Figure 21 (a): Linking between Lexical Semantics and Syntax in (97a)



Like (96), (97a) follows AUH. *John* and *sikthakpo* 'table cloth' are linked with actor and undergoer respectively, since the former is the highest-ranking thematic relation, while the latter is ranked the lowest. The remaining argument NP *sikthak* 'table' has no choice but to receive a non-macrorole value by default, since it cannot function as either actor or undergoer.

In contrast to (97a), (97b) exhibits a marked undergoer assignment. This is shown in Figure 21 (b):

Figure 21 (b): Linking between Lexical Semantics and Syntax in (97b)



(97b) violates AUH, since the second lowest-ranking argument *sikthak* 'table' is associated with undergoer, while the lowest-ranking argument *sikthakpo* 'table cloth' is associated with non-macrorole. The linking in (97b) is summarized in (100):

(100) Association between Thematic Relations and Macroroles in (97b)

MR:		Actor	Undergoer	Non-MR
Th.Rel.:		Effector	Locative	Theme
LS:	[**do'** (John, Ø) CAUSE [BECOME		**be-on'** (table,	table cloth)]

I follow Foley and Van Valin (1984) in assuming that theme NPs (the second argument of a two-place state predicate) with no undergoer value are marked by an instrumental case, *(u)lo* in Korean and *with* in English. I provide a detailed account of instrumental case in English and other languages (Russian, Japanese, and Korean) in Chapter 3.

Three other English examples, which involve the marked undergoer assignment, i.e. associating undergoer with the second-lowest thematic relation, are given in (101a,b)-(104a,b). Their LSs are given in (101c)-(104c):

(101) a. John presented the watch to Mary.
b. John presented Mary *with* the watch.

c. [**do'** (John, ø)] CAUSE [BECOME **have'** (Mary, watch)]

(102) a. John sprayed paint on the wall.
b. John sprayed the wall *with* paint.

c. [**do'** (John, ø)] CAUSE [BECOME **be-on'** (wall, paint)]

(103) a. John loaded hay on the truck.
b. John loaded the truck *with* hay.

c. [**do'** (John, ø)] CAUSE [BECOME **be-on'** (truck, hay)]

(104) a. John provided food and water for his parents.
b. John provided his parents *with* food and water.

c. [**do'** (John, ø)] CAUSE [BECOME **have'** (his parents, food and water)]

It has been illustrated above that the linking in simple sentences falls out of (95), which is, in turn, dependent on AUH, MAP, and the pivot hierarchies (82a,b).

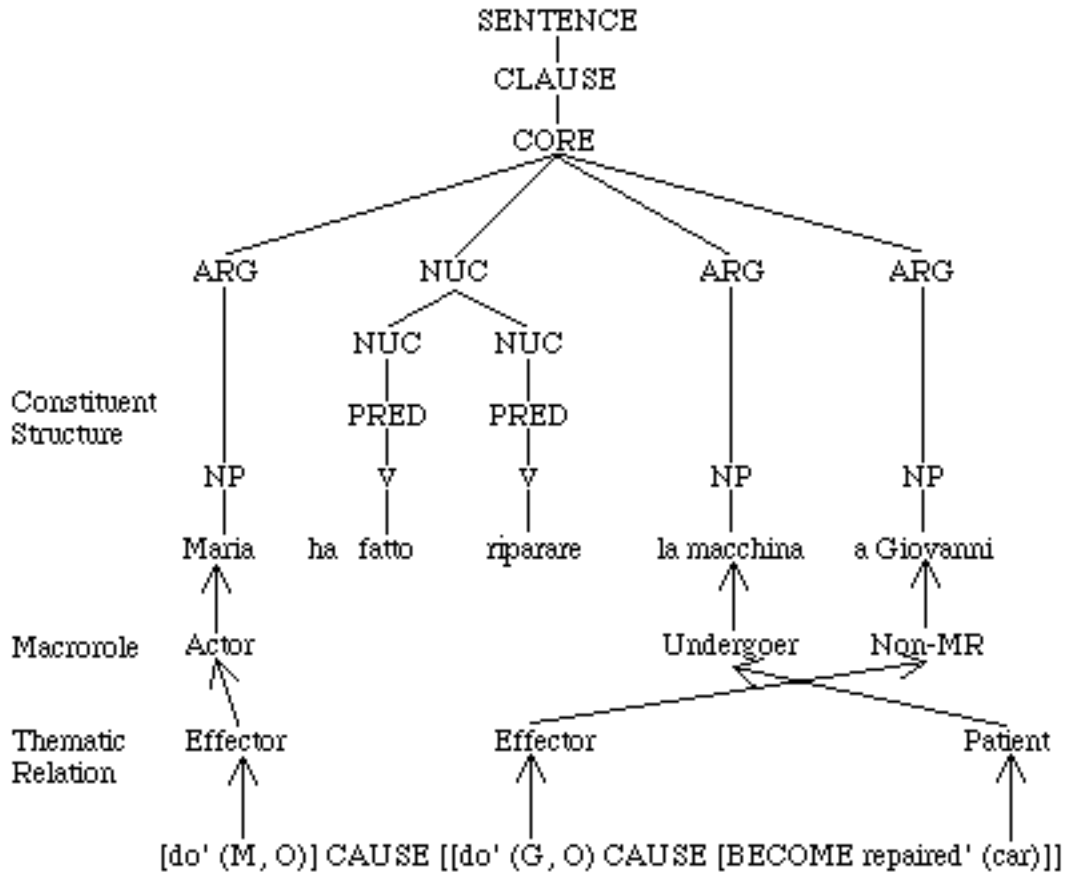
2.3.7.3 Linking in Complex Sentences

We are now ready to examine whether the linking scheme introduced in 2.3.7.2 may be extended to handle complex sentences or not. With respect to clausal junctures, each clause is linked directly to a distinct LS, and therefore no modification to the linking scheme is required to handle them. The linking scheme (95), supplemented by (92), applies in each clause independently. The same is true with respect to nuclear junctures. In a nuclear juncture, more than one predicate combine to constitute a single, complex nucleus, and for linking purposes the predicate functions as a single complex LS. For example, consider an Italian causative construction (104a) (Burzio 1986: 228), whose linking between lexical semantics and syntax is described in Figure 22 below. (105b) is the LS of (105a):

(105) a. Maria ha fatto riparare la macchina a Giovanni.
Maria has make repair the car to Giovanni.
'Maria had Giovanni repair the car'.

b. [**do'**(Maria, Ø)] CAUSE [[**do'**(Giovanni, Ø)] CAUSE [BECOME **repaired'** (car)]]

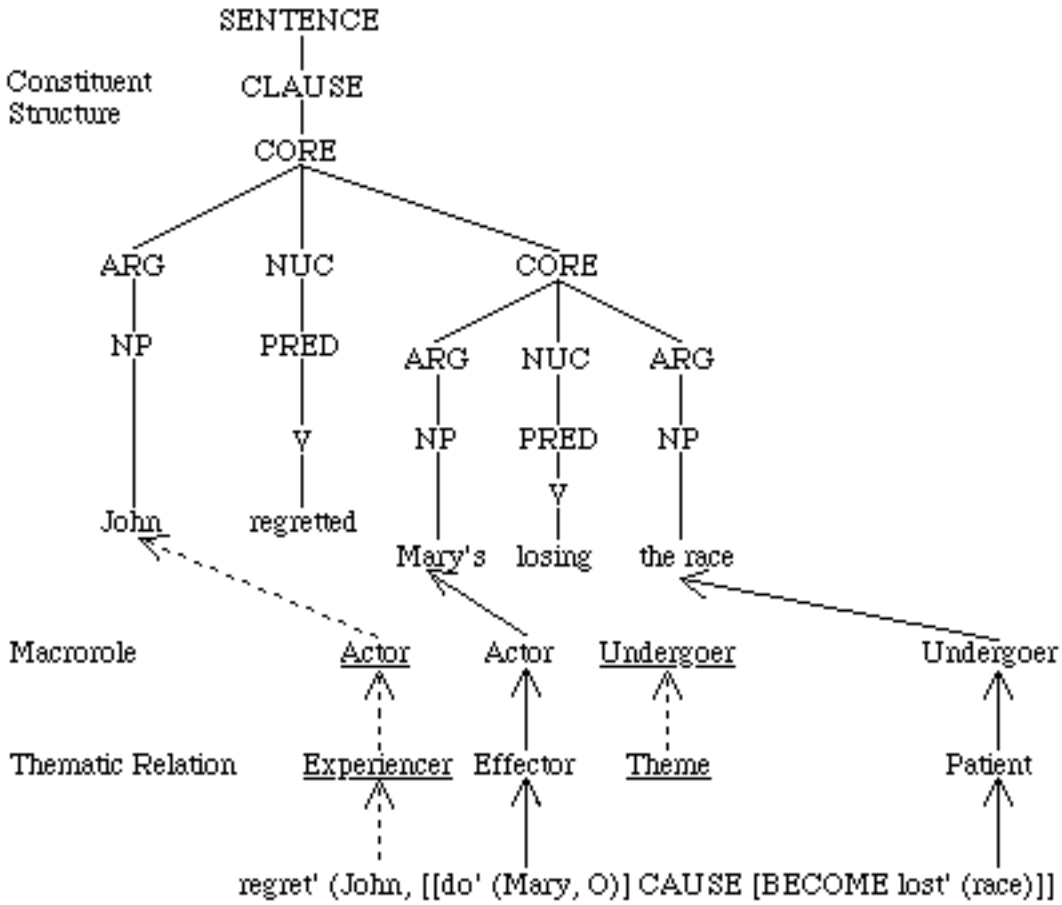
Figure 22: Nuclear Cosubordination in an Italian Causative Construction in (105a)



Both *Maria* and *Giovanni* are effectors, while *la macchina* 'the car' is patient. Even if there are two effectors, it is the effector of the superordinate CAUSE which serves as the actor in (105a). The patient NP *la macchina* is the lowest-ranking argument and gets an undergoer status. The subordinate effector *Giovanni* cannot serve as actor or undergoer and hence gets a non-macrorole value by default. The only complication this type of nuclear juncture adds to the linking scheme is that if there are two effectors as in (105a), the effector of the superordinate CAUSE outranks the embedded effector for actorhood (Van Valin 1993).

The primary complexities arise from core junctures, in particular non-subordinate core junctures, i.e. core cosubordination and core coordination. In core subordination, illustrated in (20c), the embedded LS is linked to the embedded syntactic unit, typically a clause, and the matrix LS is linked to the matrix clause; each is linked independently of the other. This linking is presented in Figure 23:

Figure 23: Linking between Lexical Semantics and Syntax in English Core Subordination



The set of thematic relation and macrorole values subcategorized by the matrix predicate are underlined in Figure 23, with their associations indicated by dashed lines. Figure 23 shows that the macrorole assignment in the matrix core proceeds independently of that in the embedded core. This is the distinctive feature of the linking between lexical semantics and syntax in core subordination and poses no problem for the linking scheme (95).

Before proceeding to non-subordinate core junctures, it is essential to have another look at the association between LSs and macroroles. We have so far considered cases including (20c) in which macroroles are associated with NPs in constituent structure. A natural question that arises in investigating the linking between semantics and syntax in complex sentences is whether it is necessary to assign macroroles to the LS projected by the embedded verb which is realized as an infinitival core or a finite clause in constituent structure. An example may help us to understand the problem. Consider (106a,b):

(106) a. I want to read the book.
b. **want'** (I, [[**do'** (I, [**read'** (I, book)]])

The above question may be paraphrased as whether the second, propositional argument of **want'** in (106b) receives an undergoer value or not. AUH and MAP require that it should get undergoer status since there is no specification about the number of macroroles. English provides no clue as to the status of the second argument of **want'**, since it case-marks no infinitival core. The crucial evidence comes from control constructions in Ancash Quechua (Cole 1984), which put the object of the embedded verb between the subject and the matrix verb (see Cole 1984 for evidence that it is biclausal):

(107) a.

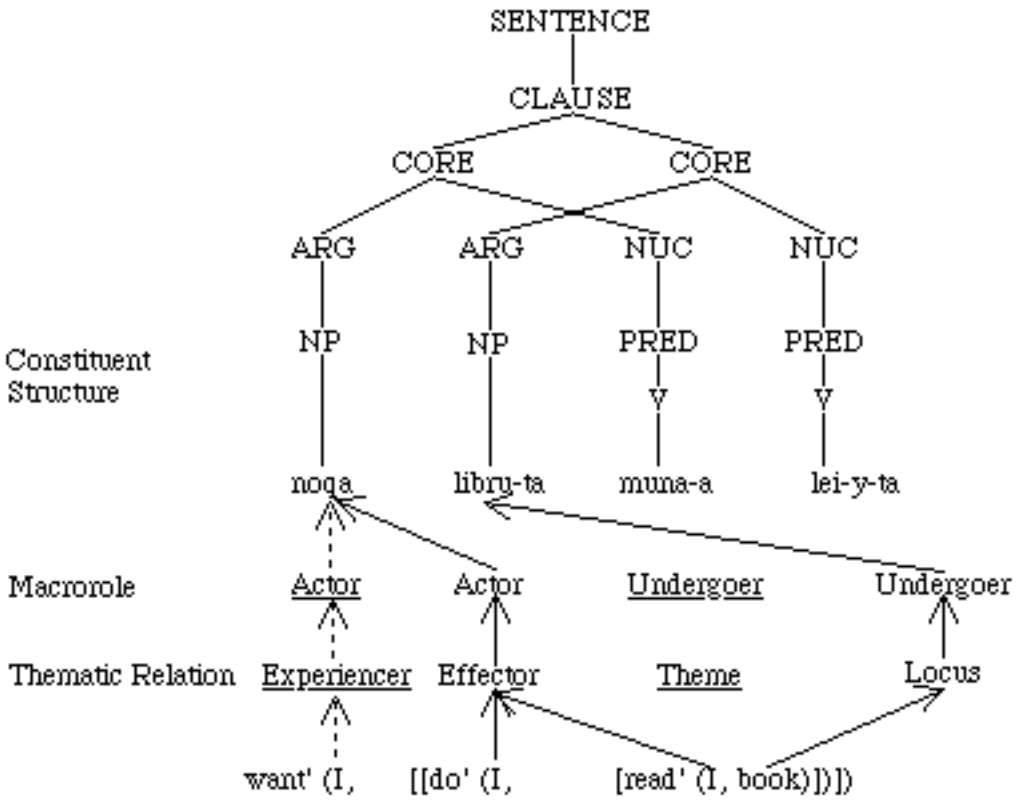
noqa	libru-ta	muna-a	lei-y-ta.
I:NOM	book-ACC	want-1	read-INF-ACC

'I want to read the book'.

b. **want'** (I, [[**do'** (I, [**read'** (I, book)]])

Figure 24 describes the linking in (107a), a translation equivalent of (106a):

Figure 24: Linking between Lexical Semantics and Syntax in (107a)



The set of thematic relation and macrorole values subcategorized by the matrix verb *muna* 'want' are underlined in Figure 24, with their associations indicated by dashed lines. The macrorole assignment licensed by the matrix verb proceeds independently of that licensed by the embedded verb *lei* 'read'. What is peculiar about (107a) is that the discontinuous infinitival core receives accusative case *ta*; if you did not assume that the embedded core in (107a) serves as undergoer, the case assignment in (107a) would remain unexplained. This consideration leads to (108):

(108) The association between LSs (thematic relations) and macroroles proceeds in accordance with AUH and MAP, no matter how LS arguments may be realized in constituent structure.

(108) means that whether LS arguments are realized as NPs, infinitival cores, or finite clauses, they are associated with macroroles in accordance with AUH and MAP.

Given (108), we are ready to discuss the linking of non-subordinate core junctures, in which the two cores share a core argument. There remain two types of co(sub)ordinate constructions to be investigated: control and raising constructions. Control constructions are illustrated by (109a,b), while raising constructions are illustrated by (110a,b):

(109) a. John tried to wash the car.
b. John persuaded Tom to wash the car.
(110) a. John seemed to stop the taxi.
b. John believed Mary to have stopped the taxi.

A control construction involves a complement with no overt subject which is nonetheless interpreted semantically as having some NP as subject. The matrix core interpreted as being the same as the missing argument in the embedded core is termed controller. On the other hand, (110a) and (110b) illustrate subject-to-subject raising and subject-to-object raising, respectively. A word is in order about the treatment of (109a,b) and (110a,b) below. I will omit operator projection from their clause structures to be presented as we proceed, since the coordination-cosubordination distinction has no effect on the linking at all. This justifies my treating (109a,b) and (110a,b) together even if (109a) involves core cosubordination, while (109b) and (110a,b) involve core coordination.

There are two more principles in addition to the the CC (92) and the linking scheme (95) which are required for describing the linking in complex sentences:

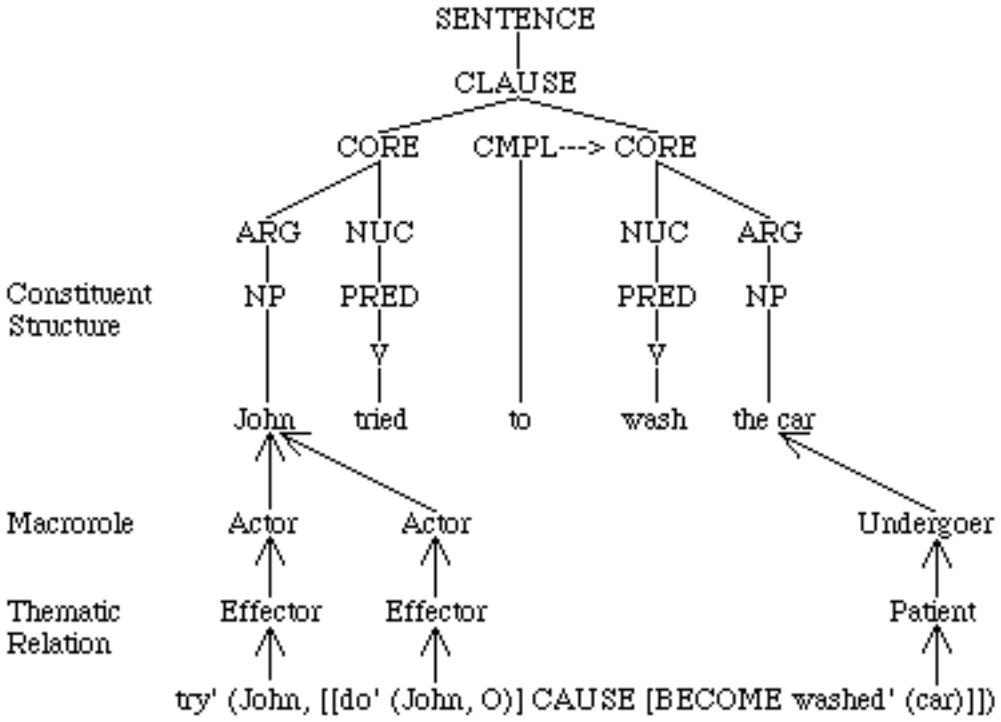
(111) a. Two arguments from distinct LSs may be linked to the same argument NP in constituent structure iff they are coindexed.

b. Theory of Obligatory Control
(i) Causative and directive speech act verbs (e.g. *persuade, ask*) have undergoer control.
(ii) All other verbs have actor control.

(111b) determines which core argument must be shared between the two cores. Control choices are characterized in terms of verbal semantics in (111b) (see also Comrie 1985 and Pollard and Sag 1994: Ch.7 for proposals along this line), rather than grammaticalrelations (Bresnan 1982b) and phrase structure (Chomsky 1981).

Let us begin with control constructions. The linking in (109a) is given in Figure 25:

Figure 25: Linking between Lexical Semantics and Syntax in Core Cosubordination

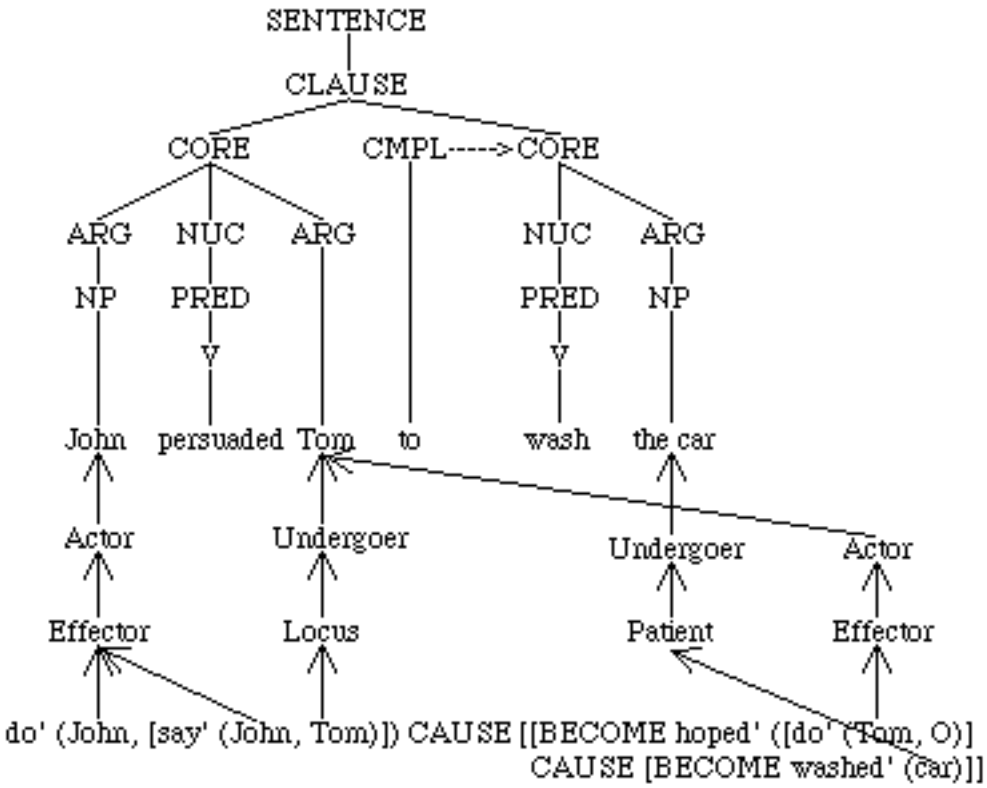


Both the first argument of **try'** and the first argument of **do'** are effectors, while *the car* is a patient, since it is the argument of the one-place state predicate **washed'**. A potential problem arises at this stage. That is, there is no argument slot in the linked core for the

actor of the embedded LS to link to. If it were not realized syntactically, the CC would be violated. However, (111b) requires that the actor of the embedded LS and the actor of the matrix LS coincide, since *try* is neither a causative nor directive speech act verb. (111a), then, allows them to be mapped onto the same syntactic argument, which satisfies the CC.

(109b) involves a different pattern of control than (109a). Its linking is diagrammed in Figure 26:

Figure 26: Linking between Lexical Semantics and Syntax in Core Coordination



The matrix verb *persuade* assigns effector (*John*), locus (*Tom*), and patient (which corresponds to the LS projected by the dependent verb *stop*). Under the assumption that *persuade* involves a marked undergoer assignment in which undergoer is associated with locus, and not with the lowest-ranking LS argument (patient), we may assign an actor and undergoer value to *John* (effector) and *Tom* (locus).[24] The embedded verb *stop* licenses effector and patient, which AUH and MAP requires to be linked with actor and undergoer respectively. A potential problem arises at this stage, as in Figure 25. There is no argument

slot in the linked core for the actor of the embedded LS. If it were not realizedsyntactically, the CC would be violated. However, (111b) comes into play at this stage. It allows the actor of the embedded LS and the undergoer of the matrix LS to coincide, since the matrix verb *persuade* is a directive speech act verb. (111a), then, allows them to be mapped onto the same syntactic argument *Tom*, which leads to the satisfaction of the CC.

These two linkings in control constructions make it clear that it is necessary to add another step to the linking scheme (95) to incorporate the crucial role played by (111a,b). (112) is a revised version of the linking scheme which incorporates (110a,b):

(112) Linking from Logical Structure to Constituent Structure (Final)

1. Determine actor/undergoer assignments on the basis of AUH and MAP.

2. Assign actor and undergoer to specific morphosyntactic statuses, e.g. case, agreement, word order (language-specific).

   a. Accusative pivot hierarchy (82a): Actor > Undergoer > Others
   b. Ergative pivot hierarchy (82b): Undergoer > Actor > Others
   c. No pivot hierarchy (e.g. Acehnese)

3. If there are more than one arguments from distinct LSs, map them to the same syntactic argument NP in constituent structure in accordance with the following:

   Theory of Obligatory Control [25, 26]
   a. Causative and directive speech act verbs have undergoer control.
   b. All other verbs have actor control.

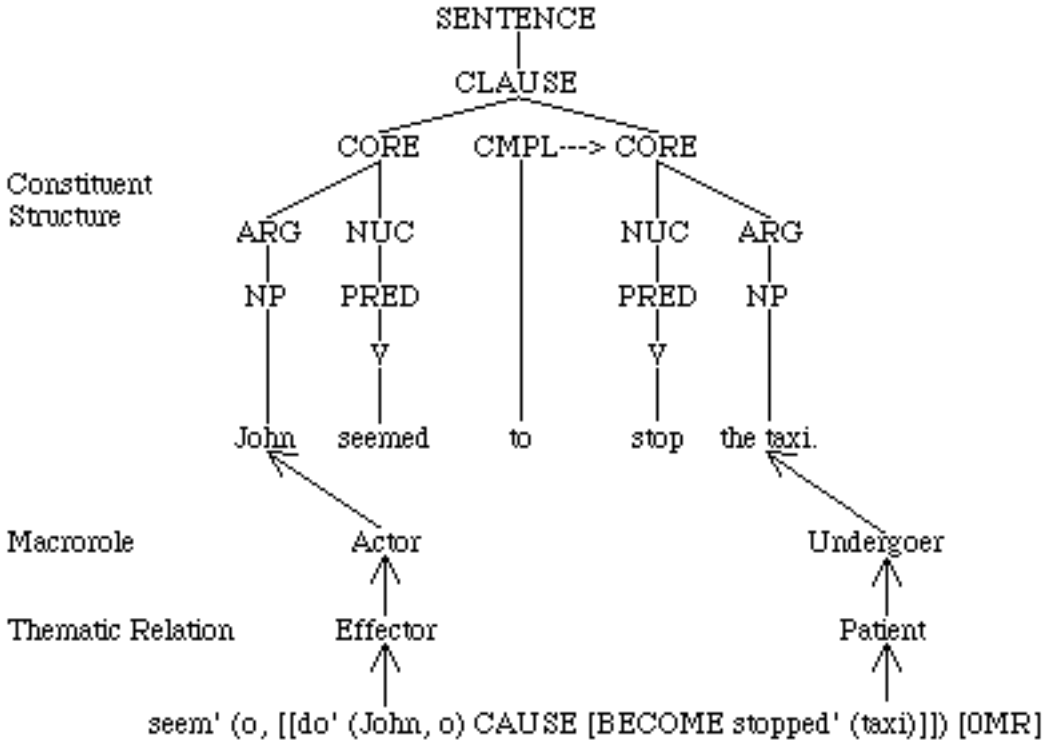
4. Assign the remaining core arguments their appropriate case markers or adpositions.

(112) is supplemented by (92), which is repeated below:

(92) Completeness Constraint
All of the arguments explicitly specified in the semantic representation of a sentence must be realized syntactically in the sentence, and all of the non-predicate elements in the syntactic representation of a sentence must be linked to an argument position in a logical structure in the semantic representation of the sentence.

There are two types of raising constructions whose linking is investigated below: subject-to-subject raising (110a) and subject-to-object raising (110b). The focus here is on whether their linking requires any modification of (92) and (112) or not. Lets us begin with (110a), whose linking between lexical semantics and syntax is diagrammed in Figure 27:

Figure 27: Linking between Lexical Semantics and Syntax in Core Coordination 1



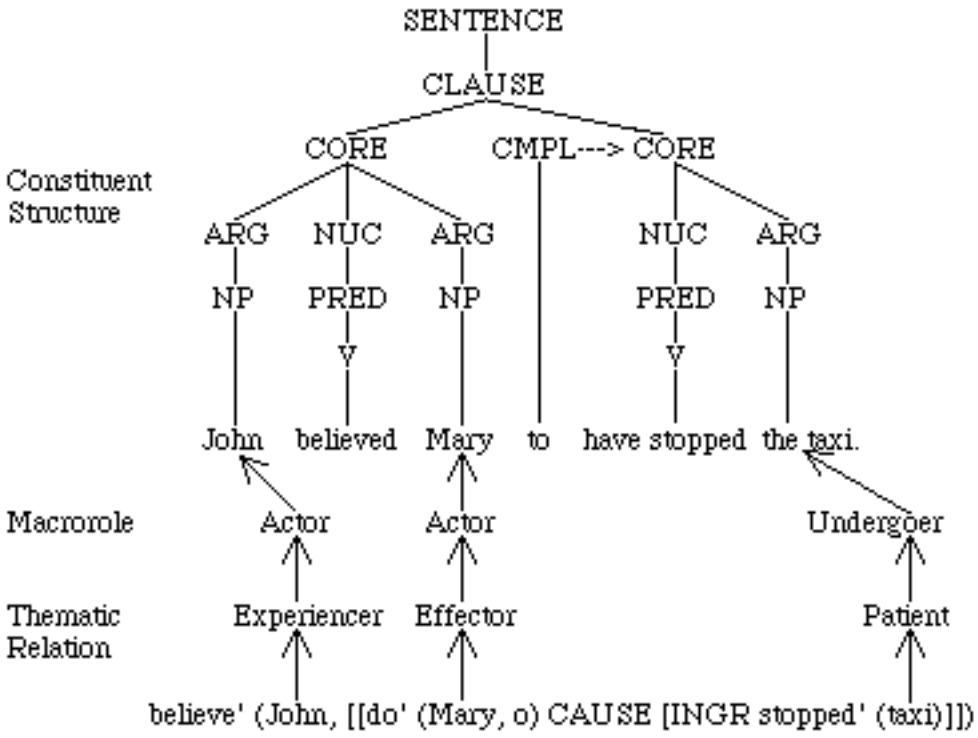
It is assumed in RRG that subject-to-subject raising verbs like *seem* and *appear* have the feature [0MR] in their lexical entries. That is, they have no macrorole to assign.

Given this assumption, the linking in (110a) proceeds as follows. First, neither of the LS arguments of *seem* may serve as macrorole. None can fill the single syntactic slot in the matrix core. Therefore, it is left open. On the other hand, the linked core is missing the prenuclear core argument slot. The semantic argument which would normally function as syntactic pivot in the linked core cannot be realized in it, since the 'subject' slot is absent. As it stands, this would lead to a CC violation. However, there is an open core argument slot in the matrix core. We may associate the LS argument *John,* which remains unlinked, with the open slot in the matrix core, thereby avoiding the CC violation.

It is notable that there is nothing extra that is needed in addition to (92) and (112) in order to describe the linking in (110a). The macrorole assignment in (110a) follows AUH and MAP, while what has been described as subject-to-subject raising in the literature takes place in order to avoid a CC violation.

We are now in a position to analyze (110b), an example of subject-to-object raising constructions. Its linking between lexical semantics and syntax is described in Figure 28:

Figure 28: Linking between Lexical Semantics and Syntax in Core Coordination 2



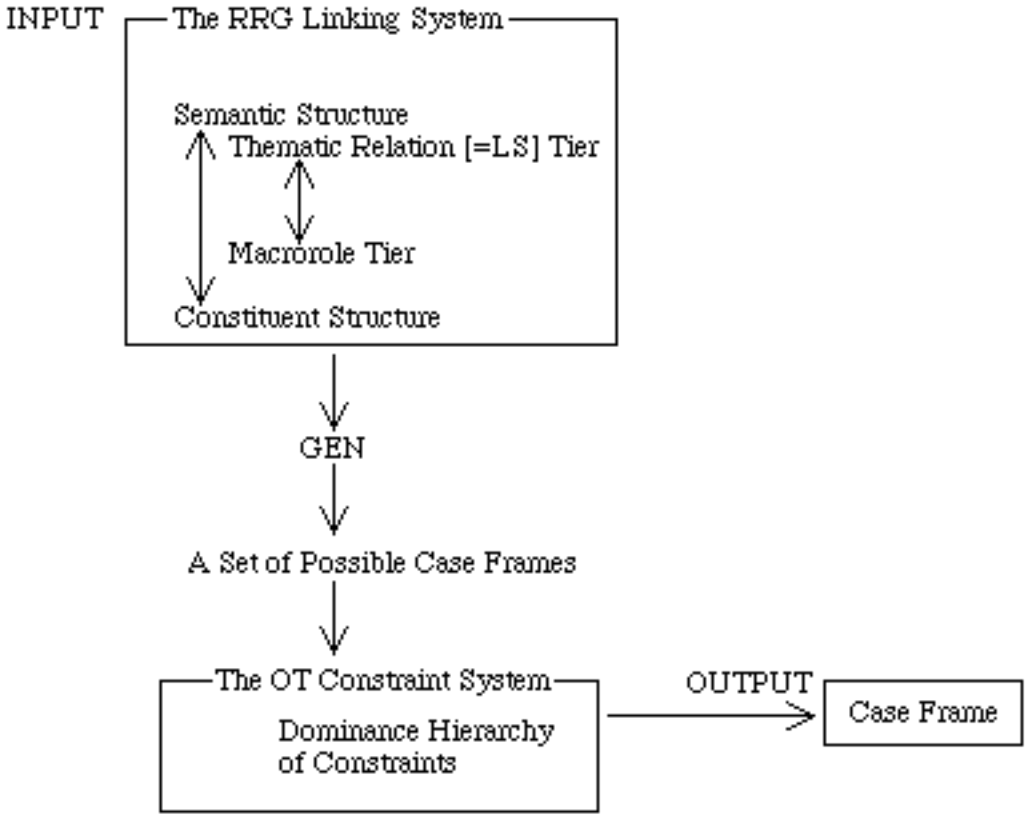
What is peculiar about (110b) is that the matrix core has another syntactic slot in addition to its semantically subcategorized argument *John.*[27] In other words, the "raised" argument *Mary* belongs syntactically to the matrix core, but receives its semantic value from the embedded predicate. The source of mismatch between syntax and semantics is that the propositional argument in the LS of (110b) is mapped onto the linked core which has one less syntactic slot than the number of LS arguments licensed by the dependent predicate. As with control constructions such as (109a) and (109b), the argument which would serve as the pivot of the linked core cannot assume its syntactic function; in order to avoid a CC violation, it has to be linked to the postnuclear open argument slot in the matrix core.

To summarize, this subsection has demonstrated that it is possible to handle the linkings in control and raising constructions with the minimal elaboration (111a,b) of the linking scheme (95) proposed for simple sentences.

2.4 Summary

This chapter has provided an overview of OT and RRG. Figure 29 describes how they are related with each other:

Figure 29: Overall Organization



The essential idea is that the input to the OT constraint system is provided by the RRG linking system between semantic structure (i.e. the two-tiered system of semantic roles, the thematic relation tier and the macrorole tier) and constituent structure, which may be summarized by (92) and (112). The OT constraint system, then, evaluates a set of candidates (in this case, case frames) produced by GEN and normally produces the optimal case frame which best-satisfies the constraint system.

Notes

1. **Harmonic Grammar** (Legendre et al. 1990), a precursor of OT, is closer to connectionism, since the strength of constraints is encoded in probabilistic terms.

2. See Bresnan (1996) and Orgun (1996) for attempts to combine unification-based frameworks (LFG, HPSG) with OT.

3. Constraint splitting is another major source of cross-linguistic variation. See Prince and Smolensky (1993: Ch.8) for illustration.

4. See Jacobs (1995) and Zubritskaya (1994) for attempts to apply OT to historical (phonological) changes.

5. Another way of incorporating variation is **partial ranking**, in which constraints are unranked in a tie block. See Hammond (1994) and Anttila (1995). See also Reynolds and Nagy (1994), who propose **floating constraints** whereby some particular constraint(s) within a single grammar may be represented as falling anywhere within a range in the ranking hierarchy (Reynolds and Nagy 1994: 282).

6. See Inkelas et al. (1996) for discussion about the consequence of constraint re-ranking (what they term **co-phonology**). The most serious problem is that if a language has, say five alternate rankings, its speakers are supposed to have five grammars. There should be a principled way to restrict proliferation of subgrammars.

7. The claim that all constraints are universal and universally present has been called into question by recent work in OT (Hammond 1995). One response to this objection is to claim that OT is a meta-grammar that provides an evaluation metric; the more universal constraints a grammar has, the better it is (Paul Smolensky electronical communication on the OT list). This may be a reasonable move, but this begs a question of how to dispense with GEN, since no evaluation metric generates anything (Jean-Pierre Koenig personal communication). It may be interesting to investigate how to adapt to the present framework Golston's (1996) proposal to reduce the role played by GEN to a minimum.

8. This example contains a verb which does not serve as predicate. In this respect, (18a) is also an example of nuclear subordination.

9. Possessor NPs have an analogous dual status: they not only belong to constituent structure, but also to NP-level operators.

10. I wil use terms such as thematic relation, thematic relation tier, and thematic relation value interchangeably, but it is important to stress here that they are abbreviations for particular slots in logical structures. For example, 'effector' may be replaced by 'the first argument of **do**'' with no empirical difference. The only reason I will use those labels throughout this work is that they are shorter and more convenient than referring to a particular slot in a logical structure, e.g. the second argument of a two-place state predicate.

11. This is not necessarily the case. One may put a referential NP as the second argument of a multiple activity verb, e.g. *I watched the TV program for one hour*.

12. See Koenig (1994: 221-235) and Van Valin (1992) for critical appraisals of proto-roles. The difference between proto-roles and macroroles boils down to whether they are discrete or not and whether or not they participate in the linking.

13. That is, non-macroroles are syntactically inactive.

14. (45) is comparable to the **elsewhere default** in LFG.

15. Van Valin and LaPolla (in press: Ch.3) note that there is no language in which the activity-active accomplishment is signaled by an accusative-dative alternation on the second argument of a two-place activity verb. This is a piece of evidence against their claim that the second argument of an activity verb is a non-macrorole, not an undergoer.

16. There are languages in which the second argument of an activity predicate is marked by partitive case when the whole clause is activity, while it is marked by accusative case when the whole clause represents active accomplishment. The first pair come from French, while the second one come from Finnish (Van Valin and LaPolla in press: Ch.7):

Il	a	mang-é	du	pain.
3sg:NOM	have:3SG:PRES	eat-PSTP	PRTV	bread

'He ate bread'. (Activity)

Il	a	mang-é	le	pain.
3sg:NOM	have:3SG:PRES	eat-PSTP	the:MAS:SG	bread

'He ate the bread'. (Active Accomplishment)

Matti-Ø	luk-i	kirjo-j-a	tunni-n.
Matti-NOM;SG	read-3SG:PAST	book-PL-PRTV	hour-ACC

'Matti read books an hour'. (Activity)

Matti-Ø	luk-i	kirja-t	tunni-ssa.
Matti-NOM;SG	read-3SG:PAST	book-ACC:PL	hour-INES

'Matti read the books in an hour'. (Active Accomplishment)

Partitive cases in these examples are assigned to the second argument of a two-place activity verb (see Belletti 1988 for an analysis of partitive case as an inherent Case assigned by unaccusative verbs). Moravcsik (1978: 261) cites the following case alternation from Hungarian, which is common in eastern European languages:

Olvasta	a	könyvet.	Olvasott	a	könyvböl.
read:3SG	the	book:ACC	read:3SG	the	book:PRTV
'He read the book'.			'He read some of the book'.		

Moravcsik reports that partitive case is used when patients are partly affected. This is clearly related to the above usage of partitive case in Finnish, which is licensed by aspectual information (activity vs. accomplishment). See Wierzbicka (1983) for further discussion of partitive case in Russian.

17. Wechsler (1995) makes an analogous proposal within HPSG about what Van Valin and LaPolla (in press) term argument-adjunct prepositions.

18. Van Valin and LaPolla note that there are three situations in which the LS of the verb may be augmented in such a way as to allow the occurrence of AAJ prepositions. They are: 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 a goal; 2. specifying an implement with certain types of activity verbs (e.g. *eat, fight, write*); and 3. specifying a beneficiary of some kind with *for*.

19. Languages such as Archi (Northeast Caucasian) pose a further problem, since there is little evidence available for the existence of pivot (Van Valin 1981).

20. If there are more than one NP which may undergo a particular syntactic process, then it is **pivotless**. An example of pivotless constructions is quantifier floating in Korean, which may be launched either from core actors or undergoers:

Haksaynng$_i$-i sey$_i$-myeng chayk-ul ilk-ess-ta.
student-NOM three-CLASS book-ACC read-PAST-DEC
'Three students read a book'.

Haksayng-i chayk$_i$-ul sey$_i$-kwen ilk-ess-ta.
student-NOM book-ACC three-CLASS read-PAST-DEC
'A students read three books'.

Haksaynng$_i$-i sey$_i$-myeng ttena-ss-ta.
student-NOM three-CLASS leave-PAST-DEC
'Three students left'.

*Haksaynng$_i$-eykey sey$_i$-myeng ton-i philyoha-ta.
student-DAT three-CLASS money need-DEC
'Three students need money'.

*John-i haksaynng$_i$-eykey sey$_i$-myeng chayk-ul cwu-ess-ta.
John-NOM student-DAT three-CLASS book-ACC give-PAST-DEC
'John gave a book to three students'.

21. Perlmutter (1984) analyzes a controller of the *nagara* clause as **working 1**, a nominal which heads a 1-arc and a final 1, 2, or 3. Notice that this condition does not apply to a goal argument *daigaku-ni* 'to the college' in the example below, since it is not subcategorized by a verb even if it serves as a core argument:

Taroo-ga daigaku-ni dekake-ta.
Taro-NOM college-DAT go.out-PAST
'Taro went to the college'.

(87) applies only to core arguments minus argument-adjuncts. This correspond to what is termed by Dalrymple (1993) **coargument domain**, which is in contrast with **minimal complete nucleus**, formed by all core arguments which include argument-adjuncts.

22. Neither Guilfoyle et al. (1992) nor Manning (1996) discusses the first type of semantic pivot. It is not clear to me whether or not there is any natural way for them to incorporate it.

23. Manning (1996) adopts Kroeger's (1993) analysis of Tagalog as having syntactic subjects as his point of departure. See Schachter (1996), however, for a criticism of Guifoyle et al. (1992) and Kroeger (1993).

24. It might seem to be a bit odd to claim that infinitival cores and finite clauses may get semantic values, non-macrorole or undergoer. English provides no morphological clue in this respect, but the crucial evidence comes from pronominalization of infinitival and finite complements available in French. Consider the following pair, which are taken from Jones (1996: 57):

Pierre	a	annoncé	à	Marie	[que	le Beaujolais	nouveau	
Pierre	has	announce	to	Marie	that	le Beaujolais	nouveau	
est	arrivé],	et	il	l'a	annoncé	à	Solage	aussi.
is	arrived,	and	he	it.has	announced	to	Solage	also

'Pierre announced to Marie that the Beaujolais nouveau has arrived, and he also announced it to Solage'.

Pierre	a	informé	Marie	[que	le Beaujolais	nouveau		
Pierre	has	informed	Marie	that	le Beaujolais	nouveau		
est	arrivé],	et	il	en	a	informé	Solange	aussi.
is	arrived	and	he	it	has	informed	Solage	also

'Pierre informed Marie that the Beaujolais nouveau has arrived, and he also informed Solange about it'.

What is important to note here is that the finite clause in the former half of the first example is pronominalized by *le*, while the finite clause in the former half of the second example is pronominalized by *en*. The fact that *le* corresponds to a direct object, while *en* typically replaces a clause introduced by the same preposition (*à* or *de*) as introduces an indirect object NP with the same thematic relation (Jones 1996: 58-59) strongly suggests that the finite clauses in the first and second example have an undergoer and non-macrorole value, respectively. The same analysis carries over to the following pair, taken from Jones (1996: 59), which involve infinitival complement cores:

Pierre	a	interdit	à	Marie	de	partir.
Pierre	has	prohibited	to	Marie	to	leave
Pierre	a	empêché	Marie	de	partir.	
Pierre	has	prohibited	Marie	to	leave	

They both mean that Pierre prohibited Marie from leaving. The complement cores in the above pair may be pronominalized in the following way:

Pierre	l'a	interdit	à	Marie.
Pierre	it.has	prohibited	to	Marie.
Pierre	en	a	empêché	Marie.
Pierre	it	has	prohibited	Marie

'Pierre prohibited Marie from leaving'.

The first example shows that the infinitival complement of the verb *interdire* may be pronominalized by *le*, while the second example shows that the infinitival complement of the verb *empêchér* may be pronominalized by *en*. This contrast demonstrates that infinitival complements, like finite complements, may have an undergoer or non-macrorole value, depending on the macrorole assignment of the whole clause.

25. This macrorole-based control theory (Foley and Van Valin 1984; see also Cutler 1993) does not extend to the following Japanese examples, in which the controllers are marked sometimes by dative case, and sometimes by accusative case:

Taroo-ga Hanako-ni/*o kaimono-ni iku-yoo meireisi-ta.
Taro-NOM Hanako-DAT/ACC shopping-DAT go-CMPL order-PAST
'Taro ordered Hanako to go shopping'.

Taroo-ga Hanako-*ni/o kaimono-ni iku-yoo settokusi-ta.
Taro-NOM Hanako-DAT/ACC shopping-DAT go-CMPL persuade-PAST
'Taro persuaded Hanako to go shopping'.

Verbs such as *tanomu* 'ask' and *meireisuru* 'order' assign dative case to their controllers (i.e. non-macroroles), while verbs such as *settokusuru* 'persuade' assign accusative case to their controllers (i.e. undergoers). This shows that controllers of causative verbs or directive speech act verbs (e.g. *meireisuru* 'order', *tanomu* 'ask', *tanomu* 'ask') may be either non-macroroles or undergoers in Japanese. *Hanako* is the controller of the embedded actor, but it has a non-macrorole value, not an undergoer value, in the first and second example. One possible solution is to revise the theory of obligatory control in a way that does not refer to macrorole values at all (cf. Pollard and Sag 1994: Ch.7).

26. *Promise* is classified as an actor control verb under this framework, since it is neither a causative nor directive speech act verb and hence poses no problem.

27. I will propose an alternative analysis of (110b) in Chapter 3.

Chapter 3

The Case System

3.1 Introduction

There are a wide variety of views of case and case marking in the linguistics literature. Within one view, the function of case marking, at least, on subjects and direct objects is only to distinguish an agent NP from a patient NP in a clause. The following is a passage taken from Comrie (1981a: 119) (see also Dixon 1979: 68-69), which underscores the discriminatory function of case marking:

> In the intransitive construction, there is only a single argument, so there is no need, from a functional viewpoint, to mark this noun phrase in any way to distinguish it from other noun phrases. In the transitive construction, on the other hand, there are two noun phrases, and unless there is some other way (such as word order) of distinguish between them, ambiguity will result unless case marking is used.

Comrie further argues that since it is not necessary to distinguish between intransitive subject (S) and transitive subject (A) or intransitive subject (S) and transitive object (O) morphologically, the case used for intransitive subject may be used for one of the two arguments (A, O) of the transitive construction. This consideration captures two major case systems, accusative and ergative systems, both of which distinguish transitive subject from transitive object, but leaves little room for active case systems, e.g. Basque (isolate), Acehnese (Austronesian), which make a morphological distinction between an agent NP and a patient NP in intransitive clauses.

Another common way of looking at case marking is to claim that they represent grammatical relations. The most elaborate version of it is **Relational Grammar** [**RelG**] (Perlmutter 1983, Perlmutter and Rosen 1984), according to which nominative, accusative, and dative case respectively represent subject, direct object, and indirect object at one (i.e. **initial** and **final**) or some (i.e. **acting**, **working**, and **metastratal**) strata (Blake 1990, Farrell 1994).[1] For illustration, consider the following stratal diagrams:

Figure 1: Stratal Diagram of 'John gave the book to Tom'

Figure 2: Stratal Diagram of 'John was hit by Mary'

Figure 1 displays no revaluation: an **initial 1** (*John*), **2** (*book*), and **3** (*Tom*) correspond to a **final 1**, **2**, and **3**. In contrast, passivization, termed **2-to-1 advancement** in RelG, applies in Figure 2. The result of this operation is that an initial 2 (*John*) is promoted to a final 1, while an initial 1 (*Mary*) is demoted to a **chômeur**, a nominal which has lost its term status. *Mary* in Figure 2 is a 1-chômeur at the final stratum and is marked by an oblique case *by*. Imbabura Quechua, in contrast, leaves both a final 1 and its corresponding chômeur unmarked (Jake 1985), unlike many languages including English. RelG captures this interstratum relation by appeal to the notion of acting:

(1) a. English marks final 1s with nominative case.
b. Imbabura Quechua marks acting 1s with nominative case.

This type of multistratal characterization of case has been applied to a wide range of languages. Apart from the question of how RelG may handle split-ergative case systems (see Woodbury 1977 for a notable attempt), however, this view runs into trouble when it encounters languages like Tagalog (Schachter 1976, 1996) and Jacaltec (Craig 1977), which are not dominated by accusative or ergative syntax and Balinese (Artawa and Blake 1994), which permits either macrorole to serve as subject in a transitive clause.[2]

The third common way to look at case marking is to associate (syntactic) cases with particular structural positions. This approach has been developed by **Government and Binding Theory** [**GB**] (Chomsky 1981, 1986).

Chomsky (1981) introduces two important distinctions which underlie the GB approach to case marking. The first one is that between **structural** and **inherent Case**. Structural Cases consist of nominative, accusative, oblique, and genitive case and are distinguished from inherent Cases, e.g. dative, ablative, in that they are assigned to particular structural positions at **S-structure** and have no semantic content:

(2) a. NP ------> Nominative, if governed by INFL (when INFL contains AGR)
b. NP ------> Accusative, if governed by V
c. NP ------> Oblique, if governed by P
d. NP ------> Genitive, if $_{NP}$[___ X'] (X'=N', VP)

(2) shows that structural Cases are assigned configurationally. (2a)-(2d) are illustrated by (3a)-(3d), in which both the governor and the governee are underlined:

(3) a. [$_{IP}$ <u>She</u> [$_{INFL}$ (<u>AGR</u>)] [$_{VP}$ love John]]. (She loves John.)
b. [$_{IP}$ Peter [$_{VP}$ <u>loves</u> <u>her</u>]] (Peter loves her.)
c. [$_{IP}$ Peter went to school [$_{PP}$ <u>with</u> <u>her</u>]] (Peter went to school with her.)
d. [$_{NP}$ John's [$_{N'}$ father]] (John's father)
[$_{NP}$ Jane's [$_{VP}$ leaving school]] (Jane's leaving school)

In contrast, inherent Cases are assigned at **D-structure** and associated with particular thematic relations.[3] (4) shows that English associates dative case with recipient:

(4) Paul gave the book *to* John.

Another crucial distinction is made between **abstract Case** and its morphological realization. This is illustrated by a French example (5):

(5) Je aime Marie
1SG:NOM love:PRES Marie:ACC
'I love Marie'.

French makes no morphological distinction between nominative and accusative case in lexical NPs, but GB assumes that *Marie* in (5) bears an (abstract) accusative Case.

In contrast to these three views, the present study holds that (at least) nominative, accusative, ergative, and dative case have a positive semantic content which may be identified universally even if they manifest themselves differently in different languages.

This thesis depends crucially on the two-tiered system of semantic roles developed within RRG and departs from other semantic approaches to case and case marking, e.g. Wierzbicka (1980, 1988), who proposes to capture the essence of case in terms of a set of detailed verbal paraphrases, Janda (1993) and Smith (1987), both of whom cast the semantic content of case in the form of a **network model** (Langacker 1991).[4] It is also important to note that this thesis also represents a departure from RRG, presented in Van Valin (1991, 1993) and Van Valin and LaPolla (in press), according to which nominative, accusative, and ergative case have different values in different languages.

The rest of this chapter is organized as follows. Section 3.2 is devoted to a review of the previous RRG treatment of case marking, in particular Van Valin (1991) and Van Valin and LaPolla (in press). A number of problems with their analyses are raised in Section 3.3. Section 3.4 proposes a universal set of constraints for case assignment.[5] Section 3.5 handles the case assignment in complex sentences. Section 3.6 discusses how to treat oblique cases other than dative case. Section 3.7 applies the proposed constraint set to Japanese data, thereby giving content to a call for OT, while Section 3.8 addresses and answers the question of what possible case systems there are. This chapter is concluded by Section 3.9.

3.2 Review of Van Valin (1991) and Van Valin and LaPolla (in press)

3.2.1 Accusative Case Systems

Van Valin (1991) lays out the foundation of the RRG account of case marking. Its primary purpose is to treat quirky case in Icelandic on a par with what has been regarded as syntactic cases, i.e. nominative and accusative, but his proposal extends not only to other accusative case systems, but to ergative systems and thus merits a detailed examination.[6]

Van Valin (1991) proposes the following set of case marking rules for Icelandic:

(6) Case Marking Rules (Accusative: Icelandic)
   a. Highest ranking core macrorole takes NOMINATIVE case.
   b. Other core macrorole(s) take(s) ACCUSATIVE case.
   c. Non-macrorole core arguments take DATIVE as their default case.

(6c) may be overridden by more specific rules, i.e. those which apply to non-macroroles and specify their thematic relation values. The ranking of macroroles is determined by (7a):

(7) a. Privileged Syntactic Argument Selection Hierarchy [PSASH] [7]
Agent > Effector > Experiencer/Locative/Recipient > Theme > Patient

b. Privileged Syntactic Argument Selection Principles [PSASP]
Syntactically accusative constructions: Highest ranking macrorole is default.
Syntactically ergative constructions: Lowest ranking macrorole is default.

If a verb takes a pair of actor and undergoer, the actor will outrank the undergoer, since the actor is always ranked higher than the undergoer in (7a).

The working of (6) and (7) may be made clear by comparison with Zaenen et al.'s (1985) proposal. This is summarized in (8) and (9):

(8) Default Case Marking
The highest available GF [=grammatical function] is assigned NOM case, the next highest ACC case (universal).

(9) Hierarchy of Grammatical Relations
Subject [SUBJ] > Direct Object [OBJ] > Indirect Object [2OBJ] > Obliques

There are three points to make about Zaenen et al.'s (1985) account. First, they assume two types of case marking rules: the default rule (8), which governs the assignment of nominative and accusative case, and a set of lexical rules which associate oblique cases with particular thematic relations. Second, these case marking rules do not apply to phonetically unrealized NPs, since they do not end up as subjects or objects in a clause. This means that covert subjects of infinitival complements of control verbs, e.g. *want, persuade, order*, may bear no case (cf. Van Valin 1991). Finally, (8) may be overridden by more specific, lexical rules. This is illustrated by an example (10):

(10) Peim hef-ur pótt Ólaf-ur leðinleg-ur.
3PL:DAT have-PRES:3SG think:PSTP Olaf-NOM boring-NOM
'They have considered Olaf boring'.

Constructions such as (10) have posed a vexing problem for syntactic theories, since they violate the default association between subject and nominative case (cf. Harbert and Toribio 1991, Perlmutter 1984). The focus is on how Zaenen et al. (1985) derive the case frame displayed by (10). The lexical entry of the verb *pykja* 'consider' is given in (11):

(11) *pykja*: V (experiencer, theme)
[+ DAT]
(SUBJ OBJ)

The subject of (10) gets dative case which is associated with experiencer. This pre-linking prevents the subject from being subject to the default rule (8). This is why the remaining argument NP *Olaf* receives nominative case, since it is the highest available grammatical relation in (10) to which (8) may apply.

Van Valin (1991), on the other hand, proposes to specify the number of macroroles in the lexical entry of the verb *pykja* 'consider' in (10) and derive its irregular case frame from the lexical specification. For illustration, consider, again, the Icelandic example (10), which is analyzed in RRG terms in (12):

(12) **consider'** (they, Olaf) [1MR]
Thematic Relation: Experiencer Theme
Macrorole: Non-MR Undergoer

The feature [1MR] states that there is only one macrorole available in (10). It renders *pykja* 'consider' intransitive in semantic terms even if it has two LS arguments. MAP requires that *pykja* 'consider' has an undergoer argument, since there is no activity predicate in its LS (10a). Furthermore, AUH dictates that the theme must be undergoer, since the theme outranks the experiencer for undergoer status. That there is only one macrorole available in (10) forces the experiencer to receive a non-macrorole value by default. A similar analysis holds for another Icelandic example (13) (Van Valin 1991: 151):

(13) Ég skila-ð-i henni pening-un-um.
1SG:NOM return-PAST-1SG her:DAT money-the-DAT
'I returned her the money'.

The two-tiered semantic representation of (13) is given in (14):

(14) [**do'** (I, ø)] CAUSE [INGR **have'** (her, money)] [1MR]
Thematic Relation: Effector Locative Theme
Macrorole: Actor Non-MR Non-MR

The feature [1MR] in (14) states that the verb *skila* 'return' takes only one macrorole. MAP requires that the verb *skila* 'return' takes actor, since it contains an activity predicate in its LS. The subject gets an actor value since it is the highest-ranking macrorole argument, while the other two arguments, *henni* 'her' and *penig* 'money', receive a non-macrorole value. Given (6c), this macrorole assignment explains the case frame displayed by (13).

(6)-(7) bear some resemblance to (8)-(9), since both of them posit a hierarchy of semantic roles (7a) or grammatical relations (9) and assign cases to phonetically realized NPs alone on the basis of the hierarchy. However, there are two major points of contrast between (6)-(7) and (8)-(9). First, (6) treats dative case as one of the regular cases along with nominative and accusative case, while (8) separates dative case on the subject NP from nominative and accusative case, since it is licensed by the feature [+ DAT]. Second, consider the following verb agreement data (Van Valin 1991):

(15) a. Lögregl-a-n tók Sigg-u fast-a.
police-NOM-the take:3PL:PAST Sigga-ACC fast-ACC
'The police arrested Sigga'.

b. Sigg-a va-r tekin föst af lögregl-un-ni.
Sigga-NOM be:PAST-3SG take:PSTP fast:NOM by police-the-DAT
'Sigga was arrested by the police'.

c. Peim hef-ur alltaf pótt
3PL:DAT have-MASC:3SG:PRES always think:PSTP

Ólaf-ur leðinleg-ur.
Olaf-MASC:NOM boring-MASC:NOM

'They have always considered Olaf boring'.

A look at (15a)-(15c) suggests that verb agreement in Icelandic is controlled by the highest ranking macrorole core argument in RRG terms. Specifically, actor controls agreement in transitive clauses, while either macrorole controls agreement in intransitive clauses. In contrast, Zaenen et al. (1985) would have to state that verb agreement in Icelandic is controlled sometimes by subject (as in (15a,b)), sometimes by direct object (as in (15c)).[8] These points suggest that (6)-(7) may provide a more natural account of the case marking (and agreement) data of Icelandic than (8)-(9).

(6) also accommodates German examples (16a)-(16e) with no modification:

(16) a. Peter hat ein Fahrrad gekauft.
Peter has a:ACC bicycle:ACC buy:PSTP
'Peter bought a bicycle'.

b. Frantz wohnte damals in Berlin.
Frantz live:PAST then in Berlin
'Frantz lived in Berlin then'.

c. Der Gast kommt heute an.
the:NOM guest:NOM arrives today
'The guest arrives today'.

d. Peter hat den Kindern eine Geschichte erzählt.
Peter has the:DAT children:DAT a:ACC story:ACC tell:PSTP
'Peter told a story to the children'.

e. Sabine hat ihn davonlaufen sehen.
Sabine has him:ACC run.away see:PSTP
'Sabine saw him run away'.

(16a) has an actor *Peter* and an undergoer *einFahrrad* 'a bicycle'. The fact that actor is ranked higher than undergoer in the hierarchy (7a) allows (6a) to assign nominative case to *Peter*. The undergoer corresponds to 'other core macrorole' in (6b) and hence receives accusative case. *Frantz* in (16b) and *Der Gast* 'the guest' in (16c) are the only macrorole argument. Both receive nominative case, since they are the highest-ranking core macrorole argument. *Peter* and *eine Geschichte* 'a story' in (16d) get an actor and undergoer value, since *Peter* is ranked the highest on the AUH, while *eine Geschichte* 'a story' is the lowest-ranking argument. The remaining core argument *den Kindern* 'the children' receives a non-macrorole value by default. Finally, both *Sabine* and *ihn* 'him' in (16e) function as actor. (6) assigns nominative and accusative case to *Sabine* and *ihn* 'him' respectively under the assumption that the actor licensed by the matrix predicate *sehen* 'see' outranks the actor licensed by the embedded predicate *davonlaufen* 'run away'.

3.2.2 Ergative Case Systems

Van Valin and LaPolla (in press: Ch.7) propose (17a)-(17c) on the analogy of (6a)-(6c) as a set of case marking rules for ergative languages:

(17) Case Marking Rules (Ergative)
a. Lowest ranking core macrorole takes ABSOLUTIVE case.
b. Other core macrorole takes ERGATIVE case.
c. Non-macrorole core arguments take DATIVE as their default case.

A case system which realizes (17) is illustrated by Warlpiri (Pama-Nyungan). Examples (18a)-(18c) come from Simpson (1991):

(18) a. Ngarrka-ngku ka marlu-Ø panti-mi.
man-ERG PRES kangaroo-NOM spear-NPAST
'The man is spearing the kangaroo'.

b. Ngarrka-Ø ka wangka-mi
man-NOM PRES speak-NPAST
'The man is speaking'.

c. Ngarrka-ngku ka-rla kurdu-ku japujapu-Ø kiji-rni.
man-ERG PRES child-DAT ball-NOM throw-NPAST
'The man is throwing the ball to the child'.

Warlpiri marks independent noun phrases and pronouns on an ergative basis, while its clitic system which cross-references the nouns on the verb exhibits an accusative system. (17) predicts that if there is only one macrorole argument in a clause, it takes nominative case. This is borne out by (18b). Given (7a), (17a) predicts that *marlu* 'kangaroo' in (18a) appears in the nominative, since it is the lowest-ranking core macrorole in the clause. The other core macrorole *ngarrka* 'man' receives ergative case by (17b).

It is important at this point to examine the RRG account of split-ergative case systems, since most ergative languages use both accusative and ergative case system according to semantic and/or pragmatic parameters, e.g. animacy, ego-centricity, aspect, tense, mood, topicality (DeLancey 1981, Dixon 1994, Silverstein 1976, Tsunoda 1981). Van Valin and LaPolla (in press: Ch.7) illustrate how to handle split ergativity with special reference to Dyirbal (Pama-Nyungan), one of the best-known split-ergative languages.

Dyirbal is a case-marking language in the classic sense and displays a person-conditioned split pattern in which the first and second person pronouns are case-marked on an accusative basis, while the third person argument NPs are marked on an ergative basis. Nouns are accompanied by noun markers, abbreviated to 'NM' in (19), which show their

class and agree with them in case (Dixon 1972). (19a)-(19d) illustrate a whole range of transitive case frames available in Dyirbal:

(19) a. balan ɖugumbil-Ø baŋgul yaɽa-ŋgu buɽa-n.
NM:NOM woman-NOM NM:ERG man-ERG see-TNS
'The man sees the woman'. (Actor=ERG, Undergoer=NOM)

b. ŋaɖa bayi yaɽa-Ø buɽa-n.
1SG:NOM NM:NOM man-NOM see-TNS
'I see the man'. (Actor, Undergoer=NOM)

c. ŋinda ŋayguna buɽa-n.
2SG:NOM 1SG:ACC see-TNS
'You see me'. (Actor=NOM, Undergoer=ACC)

d. ŋayguna baŋgul yaɽa-ŋgu buɽa-n.
1SG:ACC NM:ERG man-ERG see-TNS.
'The man sees me'. (Actor=ERG, Undergoer=ACC)

In (19b), both arguments, actor and undergoer, get nominative case. In (19d), *yaɽ·a* 'man' receives ergative case, while *ŋ ayguna* 'me' takes accusative case. (19b) and (19d) do not fit into the nominative-accusative (19c) or the ergative-nominative (19a) pattern. Intransitive subjects in Dyirbal are normally left unmarked, whether they are the first or second person pronouns as in (20a) or the third person argument NPs as in (20b):

(20) a. ŋaɖa/ŋinda bani-ɲu.
1SG:NOM/2SG:NOM come-TNS
'I am coming/You are coming'.

b. balan ɖugumbil-Ø bani-ɲu.
NM:NOM woman-NOM come-TNS
'The woman is coming'.

(21) is Van Valin and LaPolla's (in press: Ch.7) proposal:

(21) Case Marking Rules (Dyirbal): First/Second Person Pronouns
a. Highest ranking core macrorole takes NOMINATIVE case.
b. Other core macrorole takes ACCUSATIVE case.

Case Marking Rules (Dyirbal): Third Person Argument NPs
c. Lowest ranking core macrorole takes ABSOLUTIVE case.
d. Other core macrorole takes ERGATIVE case.

Leaving aside the question of why they distinguish absolutive from nominative case when there is no morphological difference between them, it is difficult to get the whole picture of

the Dyirbal system from (21). For example, it is unclear why the contrast between the third and the first/second person causes a split pattern in Dyirbal and other ergative languages.

3.2.3 Active Case Systems

Let us turn to the RRG account of active case systems, e.g. Basque, Acehnese, Eastern Pomo (Hokan). (22a)-(22c) are examples from Basque (Ortiz de Urbina 1989):

(22) a. Jon-ek eskutitz-a bidali zuen.
John-ERG letter-NOM send AUX
'John sent the letter'.

b. Etxe-ak zutik iraun-go du
house-ERG on.foot last-FUT AUX
'The house will last'.

c. Jon-Ø heldu da.
John-NOM arrive AUX
'John has arrived'.

Basque marks actors and undergoers with ergative and nominative case respectively, whether they occur in intransitive or transitive clauses.[9] The fact that intransitive subjects may receive ergative or nominative case indicates that constraints such as (6a) and (17a) are not at work in Basque, since both accusative and ergative case systems, unlike Basque, make no morphological distinction between actor and undergoer in intransitive clauses:

(6) a. Highest ranking core macrorole takes NOMINATIVE case.
(17) a. Lowest ranking core macrorole takes NOMINATIVE case.

This leads Van Valin and LaPolla (in press: Ch.7) (see also Nakamura 1995b) to propose (23):

(23) Case Marking Rules (Ergative-Active: Basque)
a. Core actors take ERGATIVE case.
b. Core undergoers take NOMINATIVE case.
c. Non-macrorole core arguments take DATIVE as their default case.

The above analysis carries over to accusative-active case systems. A few examples from Acehnese are given in (24) (Durie 1985, 1987):

(24) a. gopnyan na-lôn-timbak'-geuh.
him:ACC DEC-1SG-shoot-3SG
'I shot him'.

b. gopnyan rhêt(-geuh).
him:ACC fall(-3SG)
'He fell'.

c. gopnyan ka-geu-jak u-keude.
he:NOM INCH-3SG-go to-town
'He went to town'.

Acehnese is a head-marking language in which actors and undergoers are signaled by bound morphemes on the verb. Undergoers are coded by agreement suffixes which occur to the right of the verb, e.g. *-geuh* in (24a,b), while actors are signaled by agreement suffixes which occur to the left of the verb, e.g. *-lôn-* in (24a), *-geu-* in (24c). In Acehnese, the issue of case marking primarily concerns the form of the agreement suffix on the verb and where it occurs (Durie 1985). Since Acehnese does not exhibit neutralization of the case-marking contrasts found in transitive verbs, we may propose the following set of case marking rules for Acehnese:

(25) Case Marking Rules (Accusative-Active: Acehnese)
a. Core actors take NOMINATIVE case.
b. Core undergoers take ACCUSATIVE case.
c. Non-macrorole core arguments take DATIVE as their default case.

We may generalize (23) and (25) into a set of case marking rules for active case systems.

3.3 Problems in Van Valin (1991) and Van Valin and LaPolla (in press)

3.3.1 Conceptual Problem: What Do Case Systems Share Universally?

(26a)-(26i) are a list of all the case marking rules necessary for describing the major case systems, accusative, ergative, and active:

(26) a. Highest ranking core macrorole takes NOMINATIVE case.
b. Lowest ranking core macrorole takes ABSOLUTIVE case.
c. Core actors take NOMINATIVE case.
d. Core undergoers take NOMINATIVE case.
e. Core actors take ERGATIVE case.
f. Other core macrorole takes ERGATIVE case.
g. Core undergoers take ACCUSATIVE case.
h. Other core macrorole takes ACCUSATIVE case.
i. Non-macrorole core arguments take DATIVE as their default case.

A look at (26) suggests that as many as three constraints (26a), (26c), and (26d) are needed to describe the typological distribution of nominative case. It is impossible to understand

what is shared by these rules. Likewise, the semantic contents of ergative and accusative case are not transparent in (26). The intuition one would like to capture is that ergative and accusative case mark actors and undergoers respectively. Intransitive actors are normally left unmarked in ergative languages, but it is clear that ergative case marks actors only.[10] From this, it is fair to say that (26)'s reference to the relative ranking of actor and undergoer makes it very difficult to understand what nominative, accusative, and ergative case represent and to show what case systems share and how they differ from each other.

3.3.2 Empirical Problem 1: Non-Macrorole ≠ Nominative Case?

There are three empirical problems with the set of case marking rules, (6), (17), (21), (23), and (25), proposed by Van Valin (1991) and Van Valin and LaPolla (in press).

The first problem is that (6) fails to incorporate a number of accusative case systems in which non-macrorole arguments may receive nominative case when they are the only argument in a clause.[11] This is a violation of (6c), according to which non-macrorole core arguments may only show up in the dative. (6) leaves no room for assigning nominative case to non-macroroles. It is undeniable that there do not seem to be many accusative languages which allow this possibility, e.g. Japanese, French, Imbabura Quechua, but they have to be incorporated into any general theory of case.[12] Some examples are given in (27b)-(31b), the passive counterparts of (27a)-(31a):

(27) a. Taroo-ga sensei-ni choosensi-ta.
Taro-NOM teacher-DAT defy-PAST
'Taro defied the teacher'.

b. Sensei-ga Taroo-ni choosens-are-ta.
teacher-NOM Taro-DAT defy-PASS-PAST
'The teacher was defied by Taro'.

(28) a. Taroo-ga Hanako-ni yorikakat-ta.
Taro-NOM Hanako-DAT lean.on-PAST
'Taro leaned on Hanako'.

b. Hanako-ga Taroo-ni yorikakar-are-ta.
Hanako-NOM Taro-DAT lean.on-PASS-PAST
'Hanako was leaned on by Taro'.

(29) a. Marie a obéi à Pierre.
Marie has obey:PSTP DAT Pierre
'Marie obeyed Pierre'.

b. Pierre a été obéi par Marie.
Pierre has been obey:PSTP by Marie
'Pierre was obeyed by Marie'.

(30) a. nuca-ca pala-wan alla-rca-ni.
1SG-TOP shovel-INSTR dig-PAST-1SG
'I dug with the shovel'.

b. pala-ca (nuca) alla-shca ca-rca.
shovel-TOP (1SG:NOM) dig-PASS be-3SG:PAST
'The shovel was dug with (by me)'.

(31) a. can-ga capsi-wan cusna-rca-ngui-chu?
2SG-TOP stick-INSTR roast-PAST-2SG-QUE
'Did you roast with the stick?'

b. capsi-ca (can) cusna-shca-chu ca-rca?
shovel-TOP (2SG:NOM) roast-PASS-QUE be-3SG:PAST
'Was the stick roasted with (by you)?'

(27) and (28) are from Japanese, (29) is from French, whereas (30) and (31) come from Imbabura Quechua (Jake 1985).[13] (27)-(29) passivize non-macrorole core arguments marked by dative case, while (30)-(31) passivize non-macrorole adjuncts marked by instrumental case. What is peculiar about these examples is that they do not allow any case preservation, i.e. oblique arguments' retaining their quirky cases, under passivization. Thus, (27b)-(31b) present a serious challenge to (6), since it makes an incorrect prediction that nominative case only marks core macroroles and is never assigned to non-macrorole core arguments or adjuncts.

3.3.3 Empirical Problem 2: Multiple Nominative/Accusative Case Frames

The second potential problem with (26a)-(26i) is that they may allow nominative or accusative case to be assigned only once in a clause under the biuniqueness condition on the mapping between thematic relations and macroroles. This restriction is called into question by the following examples with multiple-nominative or multiple-accusative case frames. Examples (32)-(38) come from Korean:

(32) a. Mary-ka truck-ey cim-ul sil-ess-ta.
Mary-NOM truck-DAT luggage-ACC load-PAST-DEC

b. Mary-ka truck-ul cim-ul sil-ess-ta.
Mary-NOM truck-ACC luggage-ACC load-PAST-DEC

'Mary loaded luggage on trucks'.

(33) a. John-i haksayng-eykey chayk-ul cwu-ess-ta.
John-NOM student-DAT book-ACC give-PAST-DEC

b. John-i haksayng-ul chayk-ul cwu-ess-ta.
John-NOM student-ACC book-ACC give-PAST-DEC

'John gave the books to students'.

(34) a. John-i haksayng-eykey pap-ul mek-i-ess-ta.
John-NOM student-DAT rice-ACC eat-CAUS-PAST-DEC

b. John-i haksayng-ul pap-ul mek-i-ess-ta.
John-NOM student-ACC rice-ACC eat-CAUS-PAST-DEC

'John made students eat the rice'.

(35) a. Nay-ka ku mwune-uy tali-uy kkuth pwupwun-uy
I-NOM the octopus-GEN leg-GEN end part-GEN

cokum-ul cal-lass-ta.
bit-ACC cut-PAST-DEC

b. Nay-ka ku mwune-lul tali-lul kkuth pwupwun-ul
I-NOM the octopus-ACC leg-ACC end part-ACC

cokum-ul cal-lass-ta.
bit-ACC cut-PAST-DEC

'I cut the octopus on the end part of the leg a bit'. (O'Grady 1991: 77)

(36) a. Columbus-ka sintaylywuk-uy palkyen-ul hay-ss-ta.
Columbus-NOM new.continent-GEN discovery-ACC do-PAST-DEC

b. Columbus-ka sintaylywuk-ul palkyen-ul hay-ss-ta.
Columbus-NOM new.continent-ACC discovery-ACC do-PAST-DEC

'Columbus made the discovery of a new continent'.

(37) a. Ku kongcang-ey pwul-i na-ss-ta.
the factory-DAT fire-NOM break.out-PAST-DEC
'Fire broke out in the factory'.

b. Ku kongcang-i pwul-i na-ss-ta.
the factory-NOM fire-NOM break.out-PAST-DEC
'The factory is such that fire broke out (in it)'.

(38) a. Haksayng-eykey ton-i philyoha-ta.
student-DAT money-NOM need-DEC

b. Haksayng-i ton-i philyoha-ta.
student-NOM money-NOM need-DEC

'Students need money'.

(35b) is an example of possessor raising constructions, while (36a,b) illustrate light verb constructions. Japanese also has double-nominative constructions as illustrated by (37b)-(38b).

What is particularly intriguing here is that multiple-accusative case frames as displayed by (33b)-(36b) have to change into multiple-nominative case frames under passivization. This is demonstrated by (39b)-(42b), the passive counterparts of (33b)-(36b):

(39) a. *Haksayng-i chayk-ul cwu-e-ci-ess-ta.
student-NOM book-ACC give-INF-become-PAST-DEC

b. Haksayng-i chayk-i cwu-e-ci-ess-ta.
student-NOM book-NOM give-INF-become-PAST-DEC

'Students were given the books'.

(40) a. *Haksayng-i pap-ul mek-i-ess-ta.
student-NOM rice-ACC eat-PASS-PAST-DEC

b. Haksayng-i pap-i mek-i-ess-ta.
student-NOM rice-NOM eat-PASS-PAST-DEC

'Students were made to eat the rice'.

(41) a. *Ku mwune-ka tali-lul kkuth pwupwun-ul cokum-ul
the octopus-NOM leg-ACC end part-ACC bit-ACC

cala-ci-ess-ta.
cut-PASS-PAST-DEC

b. Ku mwune-ka tali-ka kkuth pwupwun-i cokum-i
the octopus-NOM leg-NOM end part-NOM bit-NOM

cala-ci-ess-ta.
cut-PASS-PAST-DEC

'The octopus was cut on the end part of the leg a bit'.

(42) a. *Sintaylywuk-i palkyen-ul toy-ess-ta.
new.continent-NOM discovery-ACC become-PAST-DEC

b. Sintaylywuk-i palkyen-i toy-ess-ta.
new.continent-NOM discovery-NOM become-PAST-DEC

'A new continent was made the discovery of'.

These case frames seem to require us to relax the biuniqueness constraint on the mapping between thematic relations and macroroles.[14] They will be handled in Chapters 5 and 6.

3.3.4 Empirical Problem 3: PRO Must be Case-Marked

The third problem is that it is not obvious how (26) may be extended to account for some adjective-noun agreement facts in Icelandic. This problem stems from the proposal made in (26) to assign nominative, accusative, ergative, and dative case to core arguments, i.e. syntactic arguments which belong to a core node in constituent structure.

In Icelandic, *einn* 'one' may be used as a predicative adjective to modify subjects or direct objects, in which case it means 'alone'. When *einn* 'one' is used that way, it agrees in case with what it modifies. This is exemplified by (43a)-(43d) (Andrews 1990b):

(43) a. Peir köstuðu honum út um gluggann
3PL:NOM throw:PAST him:DAT out of the.window
einir.
alone:NOM

'They threw him out of the window alone [them alone]'.

b. Peir köstuðu honum út um gluggann
3PL:NOM throw:PAST him:DAT out of the.window
einum.
alone:DAT

'They threw him out of the window alone [him alone]'.

c. Honum var kastað einum út um gluggann.
him:DAT was throw-PSTP alone:DAT out of the.window
'He was thrown out of the window alone'.

d. Hana rak á land eina.
her:ACC drift:PAST ashore alone:ACC
'She drifted ashore alone'.

Einn modifies subjects (43a,c,d) and direct objects (43b) and agrees with them in case. Consider what happens if (43c,d) are embedded in control constructions as in (44a,b):

(44) a. Hann langar að vera kastað
him:ACC longs CMPL be:INF throw:PSTP

einum út um gluggann.
alone:DAT out of the.window

'He longs to be thrown out of the window alone'.

b. Hún vonast til að reka á land eina.
she:NOM hopes CMPL drift:INF ashore alone:ACC
'She hopes to drift ashore alone'.

Interestingly, even if there is no overt subject of the complement clause in (44a,b), *einn* receives a case which would be taken by the subjects missing in (44a,b). It is not obvious how to account for (44a,b) under (26), since neither of their complement subjects belong to a core node in constituent structure.

To sum up this subsection, the previous RRG account of case marking (Van Valin 1991, Van Valin and LaPolla in press) suffers from the following problems:

(45) a. Empirical Problems

1. It does not describe instances of lack of case preservation in languages such as Japanese, French, and Imbabura Quechua.

2. It is not clear how to handle multiple-nominative/accusative case frames in Korean and Japanese under the biuniqueness condition on the mapping between thematic relations and macroroles.

3. It is not clear how to account for some adjective-noun agreement data in Icelandic.

b. Conceptual Problem

1. It remains unclear what case systems share universally and how they differ from each other.

The first problem stems from the proposal made by Van Valin (1991) to define nominative, accusative, and ergative case with reference to the relative ranking of actor and undergoer based on (7a), since this leaves no room for the possibility that non-macrorole core arguments or adjuncts take nominative case. The second problem arises in connection with examples like (32)-(42), whose multiple-nominative/accusative case frames cannot be captured under the biuniqueness condition on the mapping between thematic relations and macroroles. The third problem is that it is unclear how to account for the adjective-noun

agreement data in Icelandic, if (26) apply to core arguments alone.[15] Finally, it is not explanatory to propose different sets of case marking rules for different languages. This blurs what is shared by all case systems and what distinguishes them from each other. The rest of this chapter proposes a framework which avoids these four problems.

3.4 Proposal: Simple Sentences

3.4.1 Universal Constraints

I propose (46) as part of a universal set of constraints for case assignment. These four constraints are intended as an alternative to parametric accounts (e.g. Bobaljik 1993, Levin and Massam 1984, Marantz 1991) according to which ergative and absolutive (not nominative) case are only alternate names for nominative and accusative case:

(46) Universal Constraints [16, 17]
- a. Non-macroroles take DATIVE case.
- b. LS arguments take NOMINATIVE case.
- c. Undergoers take ACCUSATIVE case.
- d. Actors take ERGATIVE case.

There are four points to be noted about the constraint set (46). First, (46a)-(46d) assign universal **case features**, which are associated in individual languages with language-particular **case forms**. This is a departure from RRG as presented in Van Valin (1993) and Van Valin and LaPolla (in press), which does not distinguish them. Second, (46) is semantic, since it refers to LSs (on the basis of which thematic relations are assigned) and macroroles, and not to structural configurations or grammatical relations. Third, (46) does not refer to the hierarchy (7a). This makes the relations between case feature/forms and their semantic contents more transparent in (46) than those in (26). Finally, (46a), (46c), and (46d) leave it underspecified whether macrorole values are assigned to core arguments or adjuncts. (46a) interacts with a set of constraints which assign oblique cases other than dative case, e.g. ablative, instrumental, locative, to non-macroroles arguments and/or adjuncts. This will be investigated in Section 3.6. (46d) is supplemented by the following constraint, which assigns a certain oblique case to actors in passive constructions:

(46) e. Actors in the periphery take X case ('X' is language-particular).

I assume that (46e) is ranked higher than (46a)-(46d) in most languages, so that passive agents receive some oblique case, and not nominative or ergative case.

The imports of (46a)-(46d) are straightforward. (46a) states that dative case may mark non-macrorole core arguments and adjuncts (cf. Silverstein 1980/1993).[18] Dative case typically marks recipient or goal NPs in ditransitive constructions, but (47) (German), (48) (Japanese), (49) (French), and (50) (Czech) illustrate that it may also mark source NPs which are non-macrorole core arguments:

(47) a. Peter erzählt den Kindern eine Geschichte.
Peter tells the:DAT children:DAT an:ACC story:ACC
'Peter tells a story to the children'.

b. Peter nimmt den Kindern das Buch.
Peter takes the:DAT children:DAT the:ACC book:ACC
'Peter takes the book from the children'.

(48) a. Taroo-ga Jiroo-ni okasi-o age-ta.
Taro-NOM Jiro-DAT cake-ACC give-PAST
'Taro gave a cake to Jiro'.

b. Taroo-ga Jiroo-ni sono uwasa-o kii-ta.
Taro-NOM Jiro-DAT that rumor-ACC hear-PAST
'Taro heard that rumor from Jiro'.

(49) a. Marie lui a donné une pomme.
Marie him:DAT has give:PSTP an:ACC apple:ACC
'Marie gave him an apple'.

b. Marie lui a caché la verité.
Marie him:DAT has hide:PSTP the:ACC truth:ACC
'Marie hid the truth from him'.

(50) a. Ludmila mu dala kytku.
Ludmila:NOM him:DAT give:PAST flower:ACC
'Ludmila gave him a flower'.

b. Ludmila nám utekla.
Ludmila:NOM 1PL:DAT run.away:PAST
'Ludmila ran away from us'. (Janda 1993: 57, 64)

The semantic distinction between goal and source is neutralized in (47)-(50). Similar neutralizations are attested in other languages as well. Moreover, Japanese examples (51a)-(51e) illustrate that dative case may mark non-macrorole adjuncts as well as arguments:

(51) a. Taroo-ga Hanako-ni but-are-ta.
Taro-NOM Hanako-DAT hit-PASS-PAST
'Taro was hit by Hanako'.

b. Kadan-ni tanpopo-ga sai-tei-ta.
flower.bed-DAT dandelion-NOM bloom-PROG-PAST
'Dandelions were blooming in the flower bed'.

c. Taroo-ga Hanako-ni kuruma-o kat-ta.
Taro-NOM Hanako-DAT car-ACC buy-PAST
'Taro bought a car for Hanako'.

d. Taroo-ga gan-ni taore-ta.
Taro-NOM cancer-DAT die-PAST
'Taro died from cancer'.

e. Taroo-ga kanemoti/binboo-ni umare-ta.
Taro-NOM rich.man/poor-DAT be.born-PAST
'Taro was born rich/poor'.

(51a)-(51e) show that dative case may mark what would be marked with instrumental, locative, benefactive, and ablative case in other languages.[19] For example, (52a) shows that German marks the passive agent with a case form which also realizes ablative case. Many Australian languages have a distinct form for locative (52c) and allative case (52d) (Blake 1987). Finally, (52e) shows that Russian uses instrumental case for qualitative attribution:

(52) a. Peter wurde von Sabine gelobt.
Peter be:PAST ABL Sabine admire:PSTP
'Peter was admired by Sabine'. (German)

b. Mary bought a cake for Susan.

c. Japanangka-rlu nya-ngu marlu pirli-ngka.
Japanangka-ERG see-PAST kangaroo rock-LOC
'Japanangka saw the kangaroo on the rock'. (Warlpiri: Simpson 1991)

d. dhiga-ia ngaba yabarra-miri.
return-TOP 1SG:PRES camp-ALL
'I am returning to camp'. (Baagandji: Blake 1987)

e. Volcata rodilis' slepymi.
wolf.cub:NOM born:REFL blind:INSTR
'The wolf-cubs were born blind'. (Russian: Janda 1993)

The contrast between (51a)-(51e) and (52a)-(52e) demonstrates that dative is the default case for non-macrorole adjuncts as well as non-macrorole core arguments.

(46b) is required by languages such as Japanese, French, and Imbabura Quechua, which require every clause to have one nominative argument, as shown by (27b)-(31b):

(27) a. Taroo-ga sensei-ni choosensi-ta.
Taro-NOM teacher-DAT defy-PAST
'Taro defied the teacher'.

b. Sensei-ga Taroo-ni choosens-are-ta.
teacher-NOM Taro-DAT defy-PASS-PAST
'The teacher was defied by Taro'.

(28) a. Taroo-ga Hanako-ni yorikakat-ta.
Taro-NOM Hanako-DAT lean.on-PAST
'Taro leaned on Hanako'.

b. Hanako-ga Taroo-ni yorikakar-are-ta.
Hanako-NOM Taro-DAT lean.on-PASS-PAST
'Hanako was leaned on by Taro'.

(29) a. Marie a obéi au capitaine.
Marie has obey:PSTP to-the captain
'Marie obeyed the captain'.

b. Le capitaine a été obéi.
the captain has been obey:PSTP
'The captain was obeyed'.

(30) a. nuca-ca pala-wan alla-rca-ni.
I-TOP shovel-INSTR dig-PAST-1SG
'I dug with the shovel'.

b. pala-ca (nuca) alla-shca ca-rca.
shovel-TOP (I:NOM) dig-PASS be-3SG:PAST
'The shovel was dug with (by me)'.

(31) a. can-ga capsi-wan cusna-rca-ngui-chu
2SG-TOP stick-INSTR roast-PAST-2SG-QUE
'Did you roast with the stick?'

b. capsi-ca (can) cusna-shca-chu ca-rca.
shovel-TOP (2SG:NOM) roast-PASS-QUE be-3SG:PAST
'Was the stick roasted with (by you)?'

(46b) states that nominative is the default case for LS arguments; it may mark any number of LS arguments. It leaves its own thematic relation and macrorole value underspecified. Another important point to notice in this connection is that unlike (26), (46) groups nominative case in accusative languages and absolutive case in ergative languages as a single case feature (cf. Bittner 1994, Bok-Bennema 1991, Murasugi 1992).

(46c) and (46d) are based on the common observation that accusative and ergative case normally mark undergoers and actors, respectively. There are two major exceptions to this general characterization, however.[20]

The first class consists of those accusative cases, illustrated in (53a)-(53c) (Korean), (53d) (German), (53e) (Finnish), and (53f) (Russian), which mark a particular class of adverbial adjuncts, e.g. frequency, duration, distance, path, which are termed **situation delimiters** (extensive measure functions which temporally quantify the event or state depicted by the clause) by Wechsler and Lee (1996):

(53) a. John-i wuli chayk-ul seypen-ul ilk-ess-ta.
John-NOM my book-ACC three.times-ACC read-PAST-DEC
'John read my book three times'.

b. John-i twupen-ul oych-ess-ta.
John-NOM two.times-ACC yell-PAST-DEC
'John yelled twice'.

c. John-i chayk-ul twusikan-ul ilk-ess-ta.
John-NOM book-ACC two.hour-ACC read-PAST-DEC
'John read the book for two hours'.

d. Peter arbeitet nicht den ganzen Tag
Peter works NEG the:ACC entire:ACC day:ACC
'Peter does not work all day long'.

e. Luotin Kekkoseen yhden vuoden kolmannen kerran.
trust:1SG Kekkonen:ILL one year:ACC third time:ACC
'I trusted Kekkonen for a year for the third time'. (Maling 1993)

f. Ivan taskal cemodan vsju dorogu.
Ivan lug:PAST suitcase:ACC all road:ACC
'Ivan lugged the suitcase the whole way'. (Fowler and Yadroff 1993)

I leave it for further research how to attribute these accusative cases to (46c) (cf. Smith 1992, Wechsler and Lee 1996).[21,22] The second exceptional use of accusative case is illustrated by an Icelandic example (54) (adapted from Thráinsson 1979):

(54) Jón tel-ur Harald hafa teki-ð
John:NOM believe-3SG:PRES Harold:ACC have:INF take-PSTP

bók-in-a.
book-the-ACC

'John believes Harold to have taken the book'.

These subject-to-object raising constructions also seem to fall outside the scope of (46c), since they apparently allow accusative case to be assigned to "raised" actors. I postpone their treatment until the next section.

The OT grammar of case marking proposed in this section is described in (55), in which the set of ranked constraints takes as input a set of thematic relation and macrorole values licensed by verbs and yields their case frames as output:

(55) The OT Grammar of Case

Input: A Set of Thematic Relation and Macrorole Values

The Universal Set of Constraints (46) Ranked in a Particular Way

Output: Case Frame

The constraint hierarchy applies to each input supplied by a nucleus or verb independently and yields its optimal case frame. I postpone a discussion of how the OT-based grammar of case applies in complex sentences that involve more than one nucleus until Section 3.5.

The crucial question to ask at this point is whether the contraint set (46a)-(46d) are equally ranked initially (Tesar and Smolensky 1993) or they have a default ranking on the basis of markedness (Demuth 1995, Gnanadesikan 1995, Itô and Mester 1995, Yip 1993). Before proceeding to the question of whether the universal constraints (46a)-(46d) are initially ranked or randomly ranked, it is necessary to clarify the relationship between **case features** and **case forms**.[23]

3.4.2 Case Features vs. Case Forms

I assume that case features constitute a universal inventory, part of which is given in (46a)-(46d), and are associated in individual languages with language-particular case forms (or case-marking). The question that arises is how case features are associated with language-particular case forms. (56) describes a conceivable association between case features and case forms in a rough-and-ready fashion:

(56) Case Form: X Y Z ...

Case Features: A B C D E F G ...

The distinction between case features and case forms is called for by the fact that the mapping between case features and case forms is not necessarily one-to-one.

Silverstein (1980/1993) provides an invaluable framework that helps clarify the relation between case features and case forms. The goal of his paper is to establish implicational relations among case forms. (57), adapted from Silverstein (1980/1993), describes a **case hierarchy**, where the upper part represents implicational relations among propositional and adnominal case forms, i.e. nominative, dative, accusative, ergative, and genitive, while the lower part of the hierarchy expresses those among adverbial cases. These hierarchies are claimed to be universal:

(57) Case Hierarchy

Nom : Dat_1 <------ {Acc, Erg} <------ Gen Propositional & Adnominal

Dat_2 <------ {Loc, Instr ...} Adverbial & Propositional

The upper portion of case hierarchy states that if a language has two propositional case forms, they are nominative and dative (or "straight" and "oblique"), if a language has three propositional case forms, they are nominative, dative, and accusative or ergative, and that if a language has a case form distinct from these four, it should be genitive. This means that nominative and dative constitute the minimal case-marking system and that three/four-way case-marking systems are an elaboration on the fundamental contrast.

The same applies to the lower portion of the hierarchy, which states that if a language has a distinct instrumental or locative case form, it should also have a dative case form which mark some adjuncts. What we are seeing in (57) is a progression of gradually more and more differentiated systems, e.g. the color term system (Berlin and Kay 1969), the tense-aspect system (Bull 1960).

There are two ways of unfolding the upper portion of case hierarchy, depending on whether there is a neutralization between a dative and genitive case form or between an accusative/ergative and genitive case form:

(58) a. Nom. (Abs.) ---------- Dat.

Acc./Erg. ---------- Dat.

Gen. ---------- Dat.

b. Nom. (Abs.) ---------- Dat.

Acc./Erg. ---------- Dat.

Gen. ---------- Acc./Erg.

The arrows in (58a,b) represent paths of elaboration of case forms. For example, (58a) shows that the same case form may represent dative and ergative/accusative case feature and/or dative and genitive case feature.

An important question we have to consider at this point is: how should we name a case form which represents both accusative and dative case feature? It could be regarded as an accusative or dative case form. (59) ensures that a case form which represents more than one case feature may receive a label unambiguously:

(59) Case Form Principle [CFP]
When a single case form represents more than one case feature, adopt the most inclusive label in (58a,b) as its name.

A few examples will help to understand how (59) works. First, if a language has a case form that represents both accusative and dative case feature (e.g. Spanish, Hindi, Palauan), (59) requires us to think of it as a dative case form. Second, if a language has a case form which represents both dative and genitive case feature (e.g. Bengali), we have to regard it as a dative case form. Finally, if a language has a case form which represents both ergative and genitive case feature (e.g. Inuit, Tagalog), (59) leads us to regard it as an ergative case form, and not as a genitive case form. We will see that the CFP is not a meta principle with

no empirical consequence which only determines the choice of case forms, but a linguistic principle which is motivated by a set of data that follow.

(60) sums up the import of these two hierarchies:

(60) a. There are case systems which use two case forms, nominative and dative, and mark dative case (as case feature), i,e. non-macrorole core arguments/adjuncts, with the dative case form.

b. There are case systems which use two case forms, nominative and dative, and mark genitive case and accusative or ergative case (as case feature) with the same case form as dative case (as case feature).

c. There are case systems which use three case forms, nominative, dative, and accusative or ergative, and mark genitive case (as case feature) with the same case form as dative case (as case feature).

d. There are case systems which use three or four case forms, nominative, dative, and accusative or ergative, and mark genitive case (as case feature) with the same case form as accusative or ergative case (as case feature).

e. There are case systems which use four or five case forms, nominative, dative, accusative and/or ergative, and genitive, which mark nominative, dative, accusative and/or ergative, and genitive case (as case feature), respectively.

It is important to notice that (60a)-(60d) display a many-to-one correspondence between case features and case forms, in contrast to (60e), which exhibits an iconic, one-to-one correspondence between them. I will illustrate these correspondences below.[24]

(60a) may be illustrated by Halkomelem (Salish). Halkomelem marks lexical NPs only with two case forms, nominative and dative, in contrast to its pronouns, which has four distinct case forms, nominative, accusative, dative, and genitive (Gerdts 1988a):

(61) a. ni ʔíməs ɬə sɬénɨʔ.
AUX walk DET woman:NOM
'The woman walked'.

b. ni cám kʷθə nikʷ ʔə kʷθə sménṭ.
AUX go.up DET uncle:NOM DAT DET mountain
'Uncle went up into the mountains'.

c. ni q'ʷəl-ət-əs θə sɬénɨʔ tθə scé.ɬtən.
AUX bake-TR-ERG:3 DET woman:NOM DET salmon:NOM
'The woman baked the salmon'.

d. ni cən q'ʷáqʷ-ət ʔə kʷθə ʔən-sápəl-ʔəɬ.
AUX NOM:1 club-TR DAT DET GEN:2-shovel-PAST
'I hit him with your shovel'.

e. ni cən q'ʷál ʔə kʷθə nə-téłə.
AUX NOM:I speak DAT DET GEN:I-money
'I spoke about my money'.

f. kʷθə púkʷ ʔə-ƛ'-John
DET book-GEN:3 DAT John
'John's book'

There is no ditransitive construction in Halkomelem, since it allows only two syntactic arguments in a single core (Gerdts 1992). (61a)-(61f) show that the unmarked lexical NPs correspond to macrorole arguments, actor or undergoer, while the case form ʔə marks all oblique NPs, i.e. non-macrorole core arguments or adjuncts. The point to observe is that Halkomelem marks all non-macroroles by a single case form.

(60b) may be illustrated by two languages, Palauan (Austronesian) and Kabardian (Northwest Caucasian). First, consider examples (62a)-(62f) from Palauan (Georgopoulos 1991, Woolford 1995):

(62) a. ak-mo er a katsudo.
R:1SG-go DAT movies
'I am going to the movies'.

b. ng-kiltmekl-ii a ulaol a Peter.
R:3SG-clean-3SG floor Peter
'Peter cleaned the floor'.

c. ng-diak ku-nguiu er a hong.
NEG IR:1SG-read DAT book
'I am not reading the book'.

d. ng-mo er a ngebard er a klukuk.
R:3SG-go DAT west DAT tomorrow
'She is going to America tomorrow'.

e. ak-uleldanges-terir er a resensei er ngak
R:1SG-IMPERF-honor DAT teachers DAT me
'I respected my teacher'.

f. A Romana a omeka er a rengalek er a kukau.
Romana feed DAT children DAT taro
'Romana is feeding the children the taro'.

Palauan has only one preposition *er,* which marks human and/or specific and singular transitive undergoers which occur in imperfective clauses (62c,e,f), possessors (62e), recipients (62f), goals (62a,d), and temporal adjuncts (62d).[25] (62d) shows that *er* marks

undergoers and non-macrorole adjuncts as well as non-macrorole core arguments and possessors. (63) describes the correspondence between case features and case forms:

(63)

Semantic Content	Case Feature	Case Form
Undergoer	ACC	*er*
Non-Macrorole	DAT	
Possessor	GEN	

Palauan illustrates a case system which marks both accusative and dative case feature with the same case form. An important point to note here is that the dative case form er does not mark all undergoers; it marks only undergoers with certain semantic features which occur in imperfective clauses. This fact suggests that the primary use of dative case form in Palauan is to mark oblique NPs, and not undergoers, and lends support to the CFP (59), which requires us to regard *er* as a dative case form.

French displays (60c), a neutralization between dative and genitive case in which pronominal possessors may be marked by the dative case form. Furthermore, Mexican Spanish manifests a neutralization in which lexical NPs display a two-way case system which marks some non-macrorole core arguments (65b) and animate undergoers (65a) with the same case form. This neutralizes the distinction between accusative and dative case feature. (64a,b) are French examples, while (65a,b) are Mexican Spanish examples (due to Martha Islas):

(64) a. Marie offirira des bonbons à Pierre.
Marie give:FUT some candies DAT Pierre
'Marie will give some candies to Pierre'.

b. Marie lui pince les fesses.
Marie him:DAT pinches the:ACC buttocks:ACC
'Marie pinches his buttocks'.

(65) a. Juan conoce a Fidel.
Juan know:PRES DAT Fidel
'Juan knows Fidel'.

b. María le contó el cuento a Juan.
María him:DAT tell:PAST the story DAT Juan
'Maria told the story to Juan'.

(60b) may also be illustrated by Kabardian, as shown by (66a)-(66d):

(66) a. ɬ'ə-m sə-r fəzə-m jərəjtáhs.
man-DAT horse-NOM woman-DAT (NOM:3)-IO-ACT-gave
'The man gave the horse to the woman'.

b. ɬ'ə-m sə-r jə-wəh'áhs.
man-DAT horse-NOM (NOM:3)-ACT-killed
'The man killed the horse'.

c. ha-r zásə-m mabáhna.
dog-NOM night-DAT (NOM:3)-bark
'The dog barks at night'.

d. ɬ'ə-r fəzə-m náxra naxəzs.
man-NOM woman-DAT older (NOM:3)-is
'The man is older than the woman'.

The above examples are from Kuipers (1962). In contrast with the nominative case suffix *-r*, which may appear only once per clause, the case suffix *-m* may appear multiple times (Smith 1992). It has also been reported that *-m* also marks possessors (Blake 1994: 158). What is striking about (66) is that the case form *-m* marks transitive actors (66a,b), time adjuncts (66c), and "object of comparison" (66d) as well as recipients (66a). The CFP requires us to think of it as a dative case form. (67) describes the correspondences between case features and case forms in Kabardian:

(67)

Semantic Content	Case Feature	Case Form
Actor	ERG	*-m*
Non-Macrorole	DAT	
Possessor	GEN	

The difference between Palauan and Kabardian is that Palauan use its dative case form to mark accusative case, while Kabardian uses its dative case form to mark ergative case. On the other hand, what distinguishes Palauan from Halkomelem is that the former allows its dative case form to mark accusative case (case feature), while the latter does not. Yaghnobi (Iranian: Comrie 1981b: 169-170) displays a wider range of neutralization than Palauan and Kabardian in which the same case form may mark ergative, accusative (specific undergoers alone), genitive, and dative case feature as defined above.[26]

(60c) is a case system with three distinct case forms which uses the same form to mark genitive and dative case (as case feature). This type of case system may be illustrated by Bengali (Indo-Aryan), whose examples are given in (68) (Klaiman 1980, 1981):

(68) a. se ekti sundor meyeke dekhlo.
he:NOM a pretty girl:ACC saw
'He saw a pretty girl'.

b. taar ghum bhaanglo.
him:DAT sleep broke
'His sleep broke (He awakened).'

c. taar asukh holo.
him:DAT illness became
'He became unwell'.

d. aamaar tomaake mone porbe.
me:DAT you:ACC mind-LOC fall:FUT
'I will remember you'.

(60d) represents a case system with three case forms, nominative, accusative or ergative, and dative, which marks genitive case (case feature) with the same case form as dative case (as case feature). Inuit (Eskimo-Aleut) examples are provided in (69) (Bok-Bennema 1991, Sadock 1994):

(69) a. Hansi-p inuit tuqup-paa.
Hansi-ERG people:NOM. kill-DEC:3SG:3SG
‘Hansi killed the people’.

b. Hansi-p (Aani-mit) ilinniartin-ner-a
Hansi-ERG Anne-ABL teach-NMLZ-DEC:3SG:SG
'the teaching of Hansi (by Anne)'

We have seen in (66) that Kabardian uses the same case form for non-macroroles core arguments and adjuncts, transitive actors, and possessors. It has also been reported that the same case form is used for ergative and genitive case feature in other languages, e.g. Yup'ik Eskimo (Eskimo-Aleut), Zoque (Mexican), Laz (South Caucasian), Lak (Northeast Caucasian), Ubykh (Northwest Caucasian) (see Allen 1964, Blake 1994: 194, and Croft 1991: 206-212). These examples confirm the existence of (60d), a neutralization between ergative and genitive case feature. The CFP leads us to see the case form *-p* as a dative case form.

(60e) may be illustrated by Hindi (Mohanan 1990, Narasimhan 1995), a language which has distinct case forms for nominative, dative, ergative, and genitive case. Here are some examples from Mohanan (1990):

(70) a. ilaa-ne ek bacce-ko ut^{h}aayaa.
Ila-ERG one child-DAT lift:PERF
'Ila lifted a child'.

b. ilaa-ne ek haar ut^{h}aayaa.
Ila-ERG one necklace:NOM lift:PERF
'Ila lifted a necklace'.

c. niinaa-ne raam-ko kitaab-Ø dii.
Nina-ERG Ram-DAT book-NOM give:PERF
'Nina gave Ram a book'.

d. baccaa kamre-se niklaa.
child:NOM room-INSTR emerge:PERF
'The child emerged from the room'.

e. raajaa-kaa hasnaa mantrii-ko buraa lagaa.
king-GEN laugh-NML minister-DAT bad be.struck:PERF
'The king's laughing made the minister feel bad'.

f. ilaa-ne maa-ko yah haar diyaa.
Ila-ERG mother-DAT this:NOM necklace:NOM give:PERF
'Ila gave this necklace to mother'.

(70a)-(70c) show that Hindi marks transitive animate (or definite) undergoers in perfective clauses with the same form *ko* as recipients in ditransitive constructions, leaving inanimate and indefinite undergoers unmarked. The CFP requires us to regard *ko* as a dative case form. (71) describes the correspondence between case features and case forms in Hindi:

(71)

Semantic Content	Case Feature	Case Form
(Animate or Definite) Undergoer	ACC	*ko*
Non-Macrorole	DAT	
Actor	ERG	*ne*
Any Argument	NOM	Ø
Possessor	GEN	*kaa*

The fact that Hindi has no case form that represents accusative case (as case feature) alone sets Hindi apart from languages like Dyirbal which have a distinct case form for each of

nominative, accusative, ergative, dative, and genitive case feature (Dixon 1972). What is peculiar about Hindi ditransitive constructions is that their theme objects are always nominative even when they are definite, as in (70f). In contrast, the goal objects always receive the case form ko. This contrast suggests that the primary usage of *ko* is to mark non-macroroles, and not undergoers, and supports the CFP

Finally, let us consider Tagalog (Austronesian), a language with three propositional case forms. Common nouns are preceded by *sa, ng*, and *ang,* while proper nouns are correspondingly marked in the singular and plural by *kay/kina, ni/nina,* and *si/sina*. Examples below come from Kroeger (1993):

(72) a. Pinutol ng-magsasaka ang-sungay ng-kalabaw.
PERF-OV-cut ERG-farmer NOM-horn ERG-buffalo
'The farmer cut off the buffalo's horn'.

b. Galit kahapon si-Nenette kay-Lito.
angry yesterday NOM-Nenette DAT-Lito
'Nenette was angry at Lito'.

c. Binalutan niya ng-papel ang-libro.
PERF-DV-wrap 3SG:ERG ERG-paper NOM-book
'He covered the book with the paper'.

d. Ibinigay lahat ng-mga-guro sa-mga-bata
IV-PERF-give all ERG-PL-teacher DAT-PL-child

ang-pera.
NOM-money

'The teachers gave all the money to the children'.

e. B-um-ili ang-lalake ng-isda sa-tindahan.
PERF.AV-buy NOM-man ERG-fish DAT-store
'The man bought fish at the store'.

f. Bumabaha sa-Maynila.
AV-IMPERF-flood DAT-Manila
'There is a flood in Manila'.

g. Binigyam lahat ng-mga-guro ng-pera
DV-PERF-give all ERG-PL-teacher ERG-money

ang-mga-bata.
NOM-PL-child

'The teachers gave money to all the children'.

The case forms *sa/kay/kina* mark recipients (72d), locations (72f), and definite objects, the case forms *ng/ni/nina* mark transitive subjects (72a,c,d,g), possessors (72a), instruments (72c), and indefinite objects (72e,g), while the case forms *ang/si/sina* occur once in a clause and mark transitive actors (72e), undergoers (72a,b,c,d), and non-macrorole core arguments (72g), depending on the voice of verbs.

I propose the following correspondence between case features and case forms in Tagalog under the assumption that genitive case (as case feature) covers indefinite objects as well as possessors (see Moravcsik 1978 for examples):

(73)

Semantic Content	Case Feature	Case Form
Non-Macrorole	DAT	*sa* (common noun) *kay/kina* (personal name)
(Definite) Undergoer	ACC	
Actor	ERG	*ng* (common noun) *ni/nina* (personal name)
Possessor	GEN	
(Indefinite) Undergoer	GEN	
Any Argument	NOM	*ang* (common noun) *si/sina* (personal name)

I regard *sa/kay/kina as* the dative case form, since the prototypical function of dative case is to mark recipients in ditransitive constructions.[27] The fact that it also marks definite objects is compatible with (57), where accusative case (as case feature) may be represented by the same case form as dative case (as case feature). The fact that there are some languages, e.g. Turkish (Knecht 1986), which mark specific direct objects only with accusative case lends support to the claim that the case form *sa* represents both accusative and dative case feature.

The CFP requires us to see the case forms *ng/ni/nina* which mark both possessors and transitive actors as a ergative case form, contrary to Kroeger (1993), since (57) shows that ergative case is more inclusive than genitive case.[28] Finally, it is reasonable to analyze *ang/si/sina* as the nominative case form, since it may mark intransitive actors/undergoers, transitive actors/undergoers, and non-macrorole core arguments, depending on the voice of

verbs. This fits into the definition of nominative case in (46b) as the default case for LS arguments.

To sum up this subsection, there are many languages whose case systems allow the same case form to realize more than one case feature. These one-to-many correspondences between case features and case forms require us to make a distinction between them.[29]

3.4.3 Default Ranking

The purpose of this subsection is to show that these multiple correspondences between case features and case forms provides a valuable clue as to the markedness of case features.

We have seen the following set of neutralizations in the previous subsection:

(74) a. Case Form: DAT
Case Feature: DAT ACC
e.g. Palauan, Kabardian, Mexican Spanish, Hindi

b. Case Form: DAT
Case Feature: DAT ERG
e.g. Kabardian

c. Case Form: DAT
Case Feature: DAT GEN
e.g. Bengali, Halkomelem, Kabardian

d. Case Form: ERG
Case Feature: ERG GEN
e.g. Inuit, Tagalog

(74a)-(74d) suggest (75a)-(75d), under the assumption that the unmarked value is generally realized in neutralized contexts:

(75) a. Dative case (as case feature) is less marked than accusative case
b. Dative case is less marked than ergative case.
c. Dative case is less marked than genitive case.
d. Ergative case is less marked than genitive case.

(74a)-(74d) do not tell us anything about the relative ranking of accusative and genitive case feature, since there seems to be no example of neutralization between those two features. However, we may regard accusative case feature as less marked than genitive case feature because of the typological distribution of case forms given in (57). Taken together, we may assume the following markedness hierarchy among the four case features:

(76) DAT > ACC, ERG > GEN

Accusative and ergative case are not ranked with respect to each other, since there are many languages which have accusative and/or ergative case forms in addition to nominative and dative case forms. This means that there is no implicational relation between accusative and ergative case feature. Since nominative and dative case constitute the fundamental contrast, we may add nominative case (as case feature) to (76):

(77) NOM, DAT > ACC, ERG > GEN

The crucial question at this point is whether nominative or dative case is more marked than the other. I assume that dative case is the less marked (Silverstein 1980/1993), since dative case may involve more elaboration than nominative case, as in Kabardian. (78) shows its correspondence between case features and case forms:

(78)

Semantic Content	Case Feature	Case Form
Actor	ERG	*-m*
Non-Macrorole	DAT	
Possessor	GEN	
Any Argument	NOM	*Ø*

(78) shows that the dative case form may cover as many as three case features, while the nominative case form covers only one case feature.

From this, we may propose the following hierarchy among the case features:

(79) DAT > NOM > ACC, ERG > GEN

If one matches (79) with (46a)-(46d), one may propose (80) as the default hierarchy:

(80) Default Hierarchy: (46a) > (46b) > (46c), (46d)

(80) states that accusative and ergative cases are more marked than nominative and dative cases. Marked categories generally have a more limited distribution than the corresponding unmarked ones (Croft 1991, Gundel et al. 1986); those semantic/pragmatic features which affect accusative/ergative case assignment, e.g. animacy, topicality, do not affect dative case assignment. This explains why many languages limit the distribution of ergative and accusative case, e.g. Turkish, Mongolian, Spanish, French, Finnish, Arabic, Persian, Polish, Estonian, and most ergative languages (Comrie 1981a, Moravcsik 1978, Simpson 1991, Timberlake 1974), and licenses (46c) and/or (46d) to contain language-particular information which triggers a split. For example, Turkish marks only specific (not necessarily definite) direct objects with accusative case (81a), French assigns accusative case only to pronominal objects, while Finnish leaves objects of infinitival verbs unmarked:

(81) a. Ali kutu/kutu-yu yap-ı.
Ali:NOM box:NOM/box-ACC make-PAST
'Ali made boxes (non-specific) /the boxes'. (Turkish: Knecht 1986)

b. Marie t'aime.
Marie:NOM you:ACC-loves
'Marie loves you'.

c. Hän haluaa maalata auto.
he/she:NOM want:3SG paint:INF car:NOM
'He/She wants to paint the car'. (Finnish: Mitchell 1991)

It is worth emphasizing that across-the-board accusative case systems, which mark direct objects with accusative case consistently, are not so common as one might think (Mallinson and Blake 1981). The defective distribution of accusative case in (81a)-(81c) requires us to elaborate the constraint (46c) as in (82a)-(82c) respectively:

(82) a. *Specific* undergoers take ACCUSATIVE case.
b. *Pronominal* undergoers take ACCUSATIVE case.
c. Undergoers *which occur in finite clauses* take ACCUSATIVE case.

There may be an objection that it is possible to regard nominative case form on *kutu* 'box' in (82a) as realizing accusative case (as case feature); it may be an allomorphic form of accusative case. Similar objections may be raised against (82b) and (82c). I postpone answering these questions until Section 3.8.3.

3.4.4 A New OT Typology of Case Systems

(83)-(87) describe accusative, ergative and active case systems in this order. They show that the major typological variations of case systems are derived from re-ranking of the universal constraints (46a)-(46d):

(83) Case Marking Constraints (Accusative 1)
- a. Non-macroroles take DATIVE case.
- b. LS arguments take NOMINATIVE case.
- c. Undergoers take ACCUSATIVE case.
- d. Actors take ERGATIVE case.

e.g. Kannada (Bhat 1991), Icelandic, Korean, German (Czepluch 1988, Haider 1985)

(84) Case Marking Constraints (Accusative 2)
- a. LS arguments take NOMINATIVE case.
- b. Non-macroroles take DATIVE case.
- c. Undergoers take ACCUSATIVE case.
- d. Actors take ERGATIVE case.

e.g. Japanese (Nakamura 1995a), Imbabura Quechua (Jake 1985), French

(85) Case Marking Constraints (Ergative)
- a. Non-macroroles take DATIVE case.
- b. LS arguments take NOMINATIVE case.
- c. Actors take ERGATIVE case.
- d. Undergoers take ACCUSATIVE case.

e.g. Warlpiri (Simpson 1991), Inuit (Bok-Bennema 1991)

(86) Case Marking Constraints (Ergative-Active)
- a. Non-macroroles take DATIVE case.
- b. Actors take ERGATIVE case.
- c. LS arguments take NOMINATIVE case.
- d. Undergoers take ACCUSATIVE case.

e.g. Basque (Levin 1983, Ortiz de Urbina 1989)

(87) Case Marking Constraints (Accusative-Active)
- a. Non-macroroles take DATIVE case.
- b. Undergoers take ACCUSATIVE case.
- c. LS arguments take NOMINATIVE case.
- d. Actors take ERGATIVE case.

e.g. Acehnese (Durie 1985, 1987)

The distinction between accusative and ergative case systems, for example, comes down to the relative ranking of (46c) and (46d), while the distinction between accusative and active case systems boils down to the re-ranking of (46c) or (46d). If (46c) tops the hierarchy, it

will yield an accusative-active case system, while if (46d) tops the hierarchy, it will give rise to an ergative-active case system:

I will show in Section 3.7 how (84) accounts for (27b)-(31b), which present the empirical problem (45a1) to RRG as presented in Van Valin and LaPolla (in press):

(45) a. 1. It does not describe instances of lack of case preservation in languages such as Japanese, French, and Imbabura Quechua.

I will also address in Section 3.8 the prime question in OT: how to constrain the range of possible ranking of (46a)-(46d). This leads to a solution to the conceptual problem (45b1).

3.5 Extension: Complex Sentences

An important question to be explored in this section is the extent to which (46) has to be elaborated in order to incorporate case assignment in complex sentences. This question must be treated in conjunction with (45a3), since it arises in control constructions.

Most complex sentences pose no difficulty for the proposals made in Section 3.2. Clausal junctures consist of clauses to each of which a set of case marking constraints applies independently, while nuclear junctures, illustrated by a French example (88), act for linking purposes like simple clauses and thus require no modification to (46):

(88) Je ferai manger les pommes à Jean.
1SG make:FUT eat the apples DAT Jean
'I will make Jean eat the apples'.

The real challenge comes from non-subordinate core junctures with their obligatory sharing of a core argument.[30] These core junctures are problematic with respect to how to case-mark the shared core argument. Thus, we look at control constructions in Section 3.5.1 in connection with the adjective-noun agreement in Icelandic and proceed to subject-to-object raising and subject-to-subject raising constructions in Section 3.5.2.

3.5.1 Control Constructions

Let us begin with a review of the Icelandic agreement data which cause the problem (45a3). (43c,d) and (44a,b) are repeated below for convenience:

(43) c. Honum var kastað einum út um gluggann.
him:DAT was throw:PSTP alone:DAT out of the.window
'He was thrown out of the window alone'.

d. Hana rak á land eina.
her:ACC drift:PAST ashore alone:ACC
'She drifted ashore alone'.

(44) a. Hann langar að vera kastað
him:ACC longs CMPL be:INF throw:PSTP

einum út um gluggann.
alone:DAT out of the.window

'He longs to be thrown out of the window alone'.

b. Hún vonast til að reka á land eina.
she:NOM hopes CMPL drift:INF ashore alone:ACC
'She hopes to drift ashore alone'.

(44a) and (44b) embed (43c) and (43d), respectively. The problem raised by (44a,b) is that even if they have no syntactically realized subject in the embedded core, *einn* may appear in such a complement and may be interpreted as modifying such a covert subject because of its case marking. Specifically, *einn* in (44b) receives accusative case as if it were in (43d), in which *einn* is accusative-marked in agreement with the accusative-marked subject *hana* 'her'.

In order to understand the case assignment in (44a), it is necessary to have a look at the association between thematic relations and macroroles in the dependent core of (44a). Their associations are described in (89):

(89) **want'** (she, [[**do'** (?, Ø)] CAUSE [INGR **thrown'** (he)]]

Thematic Relation:	Effector	Patient
Macrorole:	Actor	Non-MR
Case:		DAT

I am assuming that the verb has the feature [1MR], which forces 'he' to receive dative case, since 'he' may only get a non-macrorole value. The only way to make sure that *einn* in (44b) is dative-marked is to claim that its semantic host, i.e. 'he', also receives dative case under the assumption that *einn* 'one' and its host always agree in case. That is, the only

solution available is to assign case features to LS arguments (in this case, the covert subject of the infinitival core) including those which are not realized syntactically to be case-marked. The same argument holds for (44b). In order to justify the accusative marking of *einn* 'one' in (44b), it is necessary to assume that its host, i.e. the subject of the dependent verb, is also accusative-marked even though it is not realized syntactically under any core node.

We may, then, generalize the above analyses to the following universal principle in the spirit of Hennis (1989) (see Andrews 1990a: 220-224 for an analogous proposal):

(90) Principle of Determinate Case
All LS arguments, even those which are not realized overtly in constituent structure, must receive a determinate specification for their case values.

(90) represents a crucial departure from RRG as presented in Van Valin (1993) and Van Valin and LaPolla (in press), according to which cases are assigned only to syntactically realized NPs. Although (90) bears some resemblance to the **Case Filter** in GB (Chomsky 1981), it is much stronger than the Case Filter, in that (90) requires even phonetically unrealized NPs to receive a case feature, while the Case Filter allows those covert NPs (i.e. PRO in GB terms) to escape it.[31]

Quantifier floating data in Korean provide further support for (90). Korean allows structures in which a quantifier is separated from the NP with which it is semantically associated. They may be taken as a subtype of determiner-noun agreement, since a quantifier may optionally bear a case in agreement with its host. Some examples are given in (91):

(91) a. Nay-ka ecey chayk-ul seys-ul ilk-ess-ta.
1SG-NOM yesterday book-ACC three-ACC read-PAST-DEC
'I read three books'.

b. Haksayng-i ecey seys-i ttena-ss-ta.
student-NOM yesterday three-NOM leave-PAST-DEC
'Three students left yesterday'.

c. Nay-ka chayk-ul seys-i ilk-ess-ta.
1SG-NOM book-ACC three-NOM read-PAST-DEC
'Three students read a book'.

It has been noted (Shibatani 1977) that nominative/accusative-marked NPs only may host quantifier floating. (91a)-(91c) lead us to the following generalization (Yang 1991):

(92) Floated quantifiers in Korean may bear the same case marker, accusative or nominative, as macrorole arguments they modify.[32]

Most constructions follow (92), but periphrastic causative constructions in Korean provide apparent counterexamples to (92) (O'Grady 1991: 222):

(93) a. Nay-ka haksayng-i seys-i ttena-key(-lul)
1SG-NOM student-NOM three-NOM leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

b. Nay-ka haksayng-eykey seys-i ttena-key(-lul)
1SG-NOM student-DAT three-NOM leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

c. Nay-ka haksayng-ul seys-i ttena-key(-lul)
1SG-NOM student-ACC three-NOM leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

d. Nay-ka haksayng-ul seys-ul ttena-key(-lul)
1SG-NOM student-ACC three-ACC leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

'I made three students leave'.

(93a) and (93d) follow (92), since the floated quantifiers and their covert host in (93a) and (93d) receive the same case. On the other hand, (93b) and (93c) apparently undermine (92) for the following two reasons:

(94) a. Floated quantifiers and their hosts receive different cases.
b. Dative-marked NPs host quantifier floating.

Notice that it is impossible to case-mark a quantifier and its host as in (93b) and (93c) in simple sentences. This is demonstrated by (95a)-(95d):

(95) a. *John-i haksayng-eykey sey-myeng-eykey/i
John-NOM student-DAT three-CLASS-DAT/NOM

chayk-ul cwu-ess-ta.
book-ACC give-PAST-DEC

'John gave three students books'.

b. *John-i haksayng-eykey chayk-ul seys-i
John-NOM student-DAT book-ACC three-NOM

cwu-ess-ta.
give-PAST-DEC

'John gave students three books'.

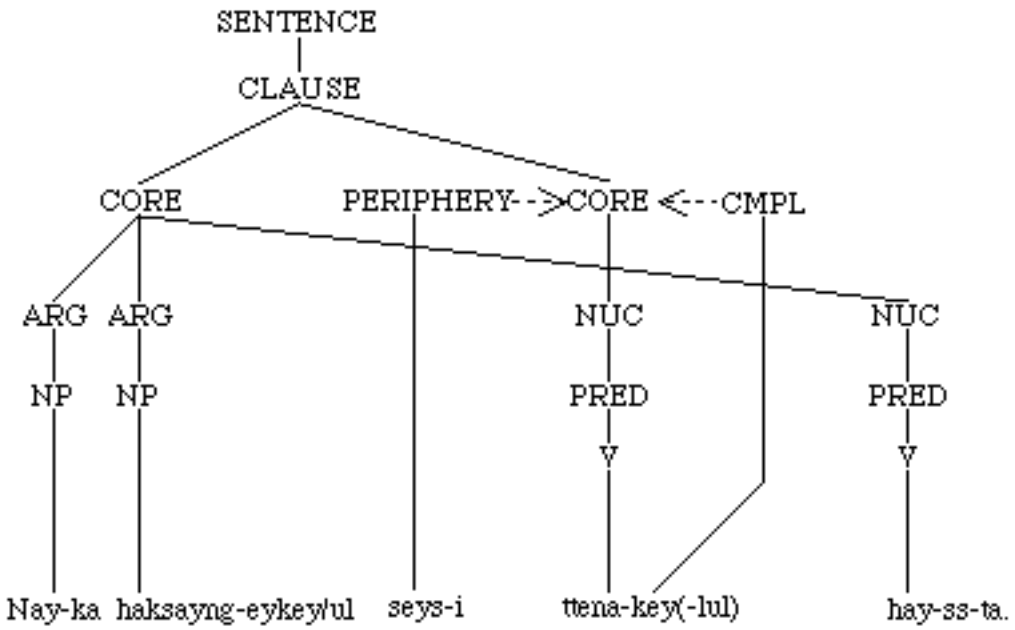
c. *Nay-ka haksayng-ul sey-myeng-i po-ass-ta.
1SG-NOM student-ACC three-CLASS-NOM see-PAST-DEC
'I saw three students.

d. *Haksayng-i sey-myeng-ul nay-lul po-ass-ta.
student-NOM three-CLASS-ACC 1SG-ACC see-PAST-DEC
'Three students saw me'.

Examples such as (93b) and (93c) have led some researchers, e.g. Gerdts (1987), to reject (92).

However, (90) provides an elegant way to assimilate these apparently anomalous case mismatches to (92). I follow Yang (1994) in analyzing (93b,c) as involving core coordination if they represent jussive meaning. The clause structure shared by (93b,c) is, then, given in Figure 3:

Figure 3: Clause Structure of (93b,c)



The LS shared by (93b,c) is given in (96):

(96) [**do'** (I, students)] CAUSE [BECOME **permitted'**/**demanded'**
([**do'** (student, [**leave'** (student)])])]

(97) shows the association between thematic relations and macroroles in (93b,c). The upper portion (97a) describes their association licensed by the matrix verb *ha-ta* 'do', while the lower portion (97b) is the one licensed by the dependent verb *ttena-ta* 'leave':

(97) a. Matrix Verb

Case: NOM DAT ACC

MR: Actor Non-MR Undergoer

Th.Rel.: Effector Locus Patient

LS: [**do'** (I, students)] CAUSE [BECOME **demanded'** (…)]

b. Embedded Verb

Case: NOM

MR: Actor

Th.Rel.: Effector

LS: [**do'** (students, [**leave'** (students)])]

Applying the constraint hierarchy (83) to (97a) and (97b) independently leads *haksayng* 'students' in (97b), which is not realized syntactically in constituent structure, to be marked by nominative case. Since the floated quantifiers in (93b) and (93c) have to agree in case with their host according to (92), they may receive nominative case.

3.5.2 Raising Constructions

The major problem that subject-to-object raising constructions such as (98a,b) present to (46) is that they apparently allow actors as well as undergoers to be marked by accusative case:

(98) a. John expected Mary to beat Tom.
b. John expected Tom to be beaten by Mary.

Mary in (98a) and *Tom* in (98b) both receive accusative case even if *Mary* is an effector-actor, while *Tom* is a patient-undergoer. This accusative marking apparently lies outside the scope of (46) (see Section 3.4.1), since (46c) allows only undergoers to receive accusative case.

(46) c. Undergoers take ACCUSATIVE case.

Consider the pair of examples, (99a) and (99b), from Korean:

(99) a. John-i haksayng-i swul-ul cal
John-NOM students-NOM wine-ACC well

macin-ta-ko mit-ess-ta.
drink-DEC-CMPL believe-PAST-DEC

'John believed that students drank wine a lot'.

b. John-i haksayng-ul swul-ul cal
John-NOM student-ACC wine-ACC well

macin-ta-ko mit-ess-ta.
drink-DEC-CMPL believe-PAST-DEC

'John believed students to drink wine a lot'.

(99b) is an example of subject-to-object raising constructions in Korean, while (99a) is the non-raising counterpart.[33] (99b) presents a challenge to (46c), since the "raised" NP *haksayng* 'students' is an effector-actor subcategorized by the embedded predicate *macin-ta*

'drink'. *Haksayng* 'students' is marked by accusative case even though it receives an actor value from the embedded predicate.[34]

However, there is syntactic evidence that *haksayng* 'students' serves as undergoer in the matrix core in (99b): one may passivize (99b) as in (100):

(100) Haksayng-i John-eyuyhayse swul-ul cal
student-NOM John-by wine-ACC well

macin-ta-ko mit-e-ci-ess-ta.
drink-DEC-CMPL believe-INF-PAST-DEC

'Students were believed to drink wine a lot'.

Since the passive morpheme *ci* allows passivization of undergoers only (see Gerdts 1986), one may take (100) as evidence for undergoer status of *haksayng* 'students' in (99b).

The question, then, is how to capture the fact that *haksayng* 'students' in (99b) receives an undergoer value in the matrix core even if it gets an actor value from the embedded verb *macin-ta* 'drink'. AUH provides no clue, since it ranks effector (*haksayng* 'students') higher than experiencer (*John*) with respect to actor selection. (101a) and (101b) describe the macrorole assignments in the matrix core and the finite complement clause in (99b), respectively:

(101) a. MR: Actor Undergoer

Th.Rel.: Experiencer Effector

LS: **believe'** (John, [**do'** (students, [**drink'** (students, wine)])])

b. MR: Actor Undergoer

Th.Rel.: Effector Locus

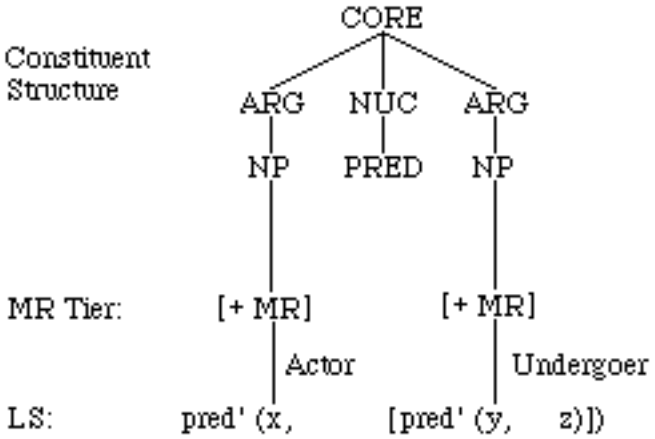
LS: **believe'** (John, [**do'** (student, [**drink'** (student, wine)])])

A look at (101a) suggests that *John* is embedded less deeply than *haksayng* 'students'. (102) captures this structural asymmetry (Van Valin and LaPolla in press: Ch.7):

(102) **Logical Structure Superiority** (**ls-superiority**) [35]
A constituent of logical structure is LS-superior to a constituent Q iff there is a constituent R in logical structure such that
(i) P is a constituent of R, and
(ii) P and R are primary arguments of the same logical structure.

Let us consider how (102) applies to (99b), whose LS is given in (101). *John* is ls-superior to *haksayng* 'students' in (101), since *haksayng* 'students' is a constituent of the second, propositional argument of **believe'**. (103) is my proposal:

(103) Macrorole Assignment in Subject-to-Object Raising Constructions



What (103) claims is that an undergoer value which is supposed to be assigned to the clausal complement ('[pred' (y, z)]') is actually assigned to the first LS argument ('y') of the embedded LS (cf. Burzio 1995). The above schema applies if and only if both LS arguments, 'x' and 'y' in (103), are macroroles and occur in the same core. (103) does not follow AUH, but nonetheless it captures the asymmetry between actor and undergoer in terms of embeddedness in LS: the more deeply embedded macrorole gets an undergoer value, while the less deeply embedded one receives an actor value.[36]

(103) describes the association between thematic relations and macroroles in the matrix core. MAP requires that a two-place verb should receive an actor and undergoer value, if there is no lexical specification about the number of macroroles which it licenses. The above linking violates MAP, however, in that the first argument of the dependent verb receives an undergoer value which is supposed to be assigned to the second, propositional argument of the matrix verb. The macrorole assignment in the dependent clause proceeds in parallel with that in the matrix core, as shown in (101a,b).

Application of the constraint hierarchy (83) to (101a) and (101b) independently yields the following case assignment in (99b):

(104) *John* *haksayng* 'students' *swul* 'wine'

NOM ACC (matrix core) / NOM (dependent clause) ACC

What is peculiar about (104) is that the "raised" NP (*haksayng* 'students') receives two cases, accusative case in the matrix core and nominative case in the dependent finite clause, simultaneously (see Smith 1992: 224-231 for an analogous proposal).

The above proposal is reminiscent of the exceptional Case-marking [ECM] hypothesis (Chomsky 1986), according to which the complement subjects of verbs such as *believe* and *expect* get accusative Case from the matrix verbs when those raising verbs select IP, not CP, as their complements. It is important to note that (103b) casts doubt on Chomsky's (1986) hypothesis; the fact that (99b) retains its complementizer *ko* makes it impossible to extend the hypothesis to (99b) with no further stipulation.

Another advantage (103) has over the exceptional Case-marking hypothesis may be illustrated by (105a,b):

(105) a. John-i haksayng-ul sey-myeng-ul swul-ul
John-NOM students-ACC three-CLASS-ACC wine-ACC

cal macin-ta-ko mit-ess-ta.
well drink-DEC-CMPL believe-PAST-DEC

b. John-i haksayng-ul sey-myeng-i swul-ul
John-NOM student-ACC three-CLASS-NOM wine-ACC

cal macin-ta-ko mit-ess-ta.
well drink-DEC-CMPL believe-PAST-DEC

'John believed three students to drink wine a lot'.

Given (92), (105a) is no surprise:

(92) Floated quantifiers in Korean may bear the same case marker, accusative or nominative, as macrorole arguments they modify.

However, (105b) displays a case mismatch which bears resemblance to those displayed by (93b) and (93c), repeated below for comparison. (105b) looks like a counterexample to (92), since the floated quantifier receives a different case from its apparent host:

(93) b. Nay-ka haksayng-eykey seys-i ttena-key(-lul)
1SG-NOM student-DAT three-NOM leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

c. Nay-ka haksayng-ul seys-i ttena-key(-lul)
1SG-NOM student-ACC three-NOM leave-CMPL(-ACC)

hay-ss-ta.
do-PAST-DEC

'I made three students leave'.

The question under consideration is how to incorporate the case mismatch in (105b) in such a way as to maintain (92). The exceptional Case-marking account provides no clue, since there is no way to assign nominative case in the complement under the assumption that nominative case is assigned structurally from a sister to I-bar. In contrast, (103) offers a straightforward explanation for the case marking of the quantifier in (105b). Consider how the case assignment proceeds in the embedded complement clause in (105b):

(106)

Case:	NOM	ACC
MR:	Actor	Undergoer
Th.Rel.:	Effector	Locus

LS: **believe'** (John, [**do'** (student, [**drink'** (student, wine)])])

(106) shows that even if the complement subject *haksayng* 'students' in (105b) is not realized phonetically, it is nominative-marked. (92) requires a floated quantifier to agree in case with its host. This means that *sey-myeng* 'three persons' in (105b) has to receive the same case as its host, which receives nominative case in the dependent clause.

To summarize this section, I have proposed the universal set of constraints which govern the assignment of core cases, i.e. nominative, dative, accusative, and ergative, and have defined the major case systems, accusative, ergative, accusative-active, and ergative-active case systems in terms of their re-ranking. I have also extended my proposal made in Section 3.5 to control and raising constructions. Specifically, I have proposed to assign case features to LS arguments, not to syntactic arguments, to handle the Icelandic data in (44a,b) and have appealed to the concept of ls-superiority in handling the macrorole assignments in subject-to-object raising constructions.

(107)-(110) are a summary of the proposals made in Sections 3.4 and 3.5:

(107) A Universal Set of Constraints

Non-macroroles take DATIVE case.
LS arguments take NOMINATIVE case.
Undergoers take ACCUSATIVE case.
Actors take ERGATIVE case.

Actors in the periphery take X case ('X' is determined on a language-particular basis).

These constraints refer to case features, and not to case forms. The correspondence between case features and case forms follows (57).

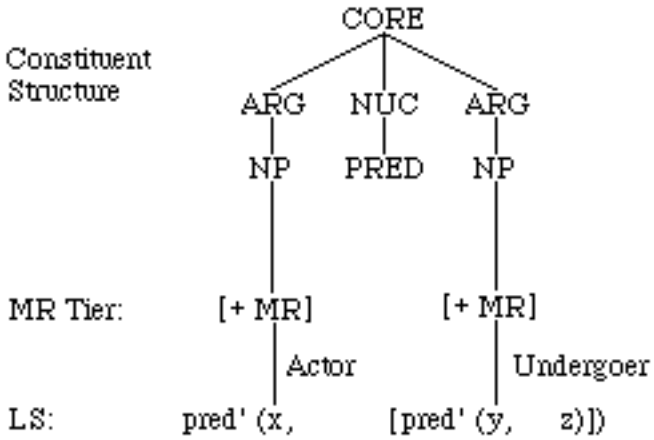
(108) Markedness Hierarchy

DAT > NOM > ACC, ERG > GEN

This hierarchy is derived from the correspondence between case forms and case features given in (57).

(109) Principle of Determinate Case
All LS arguments, even those which are not realized overtly in constituent structure, must receive a determinate specification for their case values (see Andrews 1990a and Hennis 1989 for similar proposals).

(110) Constructional Schema for Subject-to-Object Raising Constructions



The above schema holds only when both LS arguments are macroroles and occur in the same core. (103) does not follow from AUH, but it still captures the asymmetry between actor and undergoer in terms of embeddedness in LS: the more embedded macrorole receives an undergoer value, while the less embedded macrorole receives an actor value.

This schema overrides AUH, since the less embedded macrorole takes an actor value, even when it is ranked lower than the more embedded macrorole on the AUH.

3.6 Oblique Cases: Instrumental and Comitative

The aim of this section is to develop a RRG-OT account of oblique cases other than dative case. The focus in this section is on instrumental and comitative case in English, Russian, Japanese, and Korean, whose semantic contents seem to be much more difficult to identify than any other oblique case.

3.6.1 Problem with Oblique Cases

Most previous accounts treat oblique cases (or adpositions) as simply listed in the lexical entry of the verb with which they occur. The basic consensus has been that it is impossible to provide any principled account of oblique cases (see Foley and Van Valin 1984, Gawron 1986, Jackendoff 1990, and Wechsler 1995 for notable exceptions).

The major problem with handling oblique cases is **case syncretism**, which obscures the distinctions among oblique cases. For example, it is common to find the same form is used to represent ergative case as well as instrumental case, e.g. a number of Australian languages including Dyirbal, Warlpiri, and Djaru (Blake 1994, Dixon 1972, Simpson 1991). We may have some idea of case syncretism by looking at some of the cross-linguistic data compiled by Croft (1991: 237-239):

(111)

Alawa:	Erg/Instr/Loc, Ben/Gen/Purp, Abs/Dat
Gulf Arabic:	Rec/Ben/Gen (ownership)
Mandarin Chinese:	Rec/Ben
Gumbayngir:	Erg/Instr, Rec/All
Guugu Yimidhirr:	Erg/Instr, Abl/Cause, Rec/Ben/Gen/All/Loc, Ben/Purp
Hua:	Instr/Abl, Com/Causee, Ben/'on behalf of'
Kanuri:	Loc/Abl/Instr/Means/MatGen/Mann, Rec/Ben/All/Mann/Reason/Purp
Latvian:	Com/Instr, Rec/Gen (pred), Abl/Gen (non-pred)/GenMat
Malay:	Com/Instr/Assoc/Means/Mann

Modern Welsh:	Rec/Ben/Gen (some)
Mokilese:	Rec/Ben/All
Pitta-Pitta:	Erg/Instr, Ben/Gen/Purp
Punjabi:	Causee/Abl, Causee/Loc
Rumanian:	Abl/Gen/Passive Agent, All/Rec, Loc/Acc
Sre:	Com/Instr, Rec/Ben
Yapese:	Instr/Rec/Ben/Loc/All/Abl, Loc/Abl
Yaygir:	Erg/Instr, Abl/Cause, Rec/All, Gen/Ben/Purp (?)

Case syncretism arises from a tradeoff between the need for a language to be as economical as possible, i.e. to have as few case forms as possible, and the need to express particular semantic concepts as clearly as possible, i.e. to have as many case forms as necessary to be able to distinguish semantic concepts from each other. Some examples of syncretism, e.g. ergative <----> instrumental (e.g. Pitta-Pitta, Yaygir), allative <----> recipient (e.g. Gumbayngir, Guugu Yimidhirr), instrumental <----> comitative (e.g. Malay, Sre), are expressible, as will be seen below, in terms of logical structure, but others are not, e.g. manner <----> instrumental (e.g. Malay), ablative <----> instrumental (e.g. Hua), instrumental <----> allative (e.g. Yapese), benefactive <----> manner (e.g. Kanuri). I leave out of account in this work those examples of case syncretism whose motivation may not be expressible in terms of LS and refer the reader to Croft (1991) and Wierzbicka (1983), which provide excellent examples of how to approach case syncretism.

These data present a special challenge to one of the major assumptions made by OT that all constraints are universal and universally present. It is beyond the scope of this work to provide a comprehensive account of oblique case assignment, but the diverse distribution of oblique cases suggests that constraints which assign oblique cases have to refer to more information than a combination of thematic relation and macrorole values.

In what follows, I will focus on instrumental case, which is arguably the most interesting oblique case, since it is difficult to identify what is shared by all the uses of

instrumental case in intuitive terms, and will compare it with comitative case. The analysis of instrumental case in terms of LS was pioneered by Foley and Van Valin (1984: Ch.3), but it remains to be investigated to what extent their account extends to other languages, e.g. Russian (Bailyn and Rubin 1991, Janda 1993, Wierzbicka 1980), Japanese, Korean, which use instrumental case in an extensive way.[37]

The remainder of this section is organized as follows. First, I will provide a brief summary of Foley and Van Valin's (1984: Ch.3) analysis of instrumental case in English. Second, I will present the uses of instrumental and comitative case in Russian, Japanese, and Korean. A comparison of these languages reveals subtle differences in the usage of these two cases which may be captured only with reference to a combination of thematic relation and macrorole values.

3.6.2 English

The following examples covers a range of data which Foley and Van Valin (1984: Ch.3) consider:

(112) a. John hit the counter with the cane.
b. John went to the party with Mary (John and Mary went to the party).
c. John served the entree with the soup on the table (John served the entree and the soup on the table).
d. John loaded the truck with hay.

(112a) is the typical use of instrumental case. *With* in (112a) represents something which helps the actor to perform his action. The LS of (112a) is presented in (113):

(113) [[**do'** (John, Ø)] CAUSE [**do'** (cane, Ø)]] CAUSE [BECOME **hit'** (counter)]

Cane is the first argument of **do'** and therefore serves as effector. However, *cane* does not receive an actor value. The other, higher effector outranks *cane* for actor status. Again, in (114), *with* marks an effector NP which does not receive an actor value.

(112b) and (112c) involve what Foley and Van Valin term "conjunct-splitting". A look at their LSs helps understand what is meant by "conjunct-splitting":

(114) a. [**do'** (John/Mary, [**go'** (J/M)])] & BECOME **be-at'** (party, J/M)
b. [**do'** (John, Ø)] CAUSE [BECOME **be-at'** (table, entree/soup)]

Both *John* and *Mary* in (112b) occupy the first argument slot of **do'** and accordingly serve as effector in (114a). The difference between *John* and *Mary* is that *John* receives an actor value and serves as subject in (112b), while *Mary* does not. This syntactic "demotion" of *Mary* is what has been described as "conjunct-splitting". A parallel analysis holds for (112c). The LS of (112c), given in (114b), contains both *entree* and *soup* as the second argument of a two-place state predicate. They are both themes in thematic relation terms, but they receive different macrorole values; *entree* receives an undergoer value, while *soup* gets a non-macrorole value.

Finally, (112d) exhibits a locative alternation, which involves a marked linking between thematic relations and macroroles:

(115) LS: [**do'** (John, Ø)] CAUSE [BECOME **be-at'** (truck, hay)]

Th.Rel.Tier:	Effector		Locative	Theme
MR Tier:	Actor		Undergoer	Non-MR

The linking in (115) is marked, since it associates an undergoer value with the locative NP *truck*, and not with the theme NP *hay* in violation of AUH. The fact that only *truck* may undergo passivization demonstrates that *truck* receives an undergoer value in (112d):

(116) The truck was loaded with hay by John.

(115) also confirms (117), since it assigns instrumental case to the theme NP *hay* with a non-macrorole value.

These observations lead Foley and Van Valin (1984: Ch.3) to propose (117), which licenses the uses of instrumental case in (112a)-(112d):

(117) Instrumental Case in English
With marks an effector which does not receive an actor value or a theme which does not receive an undergoer value.

The import of (117) is that instrumental case marks "losers", i.e. those arguments which are expected to receive macrorole values, but do not make it to actor or undergoer.

(117) makes two interesting predictions. First, compare (118b) with (119b):

(118) a. John and Mary watch the movie.
b. John watched the movie with Mary.

(119) a. John and Mary saw the accident.
b. ?John saw the accident with Mary.

The contrast between (118b) and (119b) seems a bit mysterious, since *Mary* accompanies *John* in both (118b) and (119b), but it turns out to come down to the fact that *see* in (119) does not contain any activity predicate in its LS. The LS of (119) is given in (120):

(120) **see'** (John/Mary, accident)

(120) shows that both *John* and *Mary* are experiencers, and not effectors. Given that (117) allows only effectors and themes which receive a non-macrorole value to be marked by *with*, we may account for the subtle contrast between (118b) and (119b).

(117) makes another correct prediction that (121b) and (122b) are ungrammatical:

(121) a. John read the book and the magazine.
b. *John read the book with the magazine.

(122) a. John poked the general and the lieutenant.
b. *John poked the general with the lieutenant.

The contrast between (121b)-(122b) and (112c) comes down to whether the arguments marked by *with* serve as theme or patient in their LSs. In (112c), *the soup* serves as theme, since it is the second argument of the two-place state predicate **be-at'**, while *the magazine* and *the lieutenant* in (121b) and (122b) are patients, since they serve as the argument of a one-place state predicate (patient). This is what one would expect under (117), which assigns instrumental case to theme or effector NPs only. It is unclear how "pure" semantic case theories, e.g. Janda (1993), Wierzbicka (1980), can explain these restrictions.

We have seen in this subsection that Foley and Van Valin's (1984: Ch.3) definition of instrumental case in (117) accounts for all the uses of instrumental case in English. This success provides initial plausibility for treating oblique cases on a par with core cases, i.e. nominative, accusative, ergative, and dative case (see (46a)-(46d)) by referring to a combination of thematic relation and macrorole values. In the following three subsections, we turn to three more languages, Russian, Japanese, and Korean, in order to examine the distribution of instrumental and comitative case in those languages and verify the crosslinguistic applicability of (117).

3.6.3 Russian

(123a)-(123i) are examples of instrumental case in Russian. These examples come from Bailyn and Rubin (1991) and Janda (1993):

(123) a. Ivan rezal xleb nozom.
Ivan:NOM cut bread:ACC knife:INSTR
'Ivan cut the bread with a knife'.

b. Mama pokryla stol skatert'ju.
Mother:NOM covered table:ACC table.cloth:INSTR
'Mother covered the table with a tablecloth'.

c. Krest'jane obrabatyvali zemlju motygami.
peasants-NOM worked land:ACC hoes:INSTR
'The peasants worked the land with hoes'.

d. Sasa stal vracom.
Sasha became doctor:INSTR
'Sasha became a doctor'.

e. Oni nazvali ego Petrom.
3PL:NOM named him:ACC Peter:INSTR
'They named him Peter'.

f. Ja scitaju Sasu durakom.
1SG:NOM consider Sasha:ACC fool:INSTR
'I consider Sasha a fool'.

g. My tancovali golymi.
1PL:NOM danced nude:INSTR
'We danced nude'.

h. On rabotaet vracom.
he:NOM works doctor:INSTR
'He works as a doctor'.

i. Anja poet solov'em.
Anja:NOM sings nightingale:INSTR
'Anja sings like a nightingale'.

(117) may account for (123a)-(123c). (123a) has the most typical use of instrumental case that is comparable to (112a). (123b) is similar to (112d), in that both involve the same marked association between thematic relations and macroroles. (124a) and (124b) describe the semantic representations of (112d) and (123b), respectively:

(124) a. LS: [**do'** (John, Ø)] CAUSE [BECOME **be-at'** (truck, hay)]

MR: Actor Undergoer

b. Th.Rel.: [**do'** (Mother, Ø)] CAUSE [INGR **be-at'** (table, tablecloth)]

MR: Actor Undergoer

(124a) and (124b) do not associate an undergoer with the lowest-ranking thematic relation (theme), but with the locative NP. Finally, (123c) illustrates a use of instrumental case that is comparable to (112b). The LS of (123c) is given in (125):

(125) [**do'** (peasants/hoes, [**work'** (peasants/hoes, land)])]

(123c) takes *motygami* 'hoes' as an accomplice of the subject even if it is inanimate. It is easy to see from (125) that *motygami* 'hoes' is an effector without an actor value. Then, (123c) also falls within the scope of (117).

Let us take a close look at (123d)-(123i). They fall under (117), given Schwartz's (1993) semantic analysis of predication. Consider (123d) as a point of departure:

(123) d. Sasa stal vracom.
Sasha became doctor:INSTR
'Sasha became a doctor'.

The first thing to do here is to determine the thematic relation and macrorole value of *vracom* 'doctor'. In order to determine their association, it is essential to make a brief digression into Schwartz's (1993) proposal about how toanalyzeattributive/identificational sentences:

(126) a. John is tall. [attributional]
b. John is a politician. [identificational]

Sentences such as (126a,b) have generated some discussion in the literature, since they do not exhibit a clear-cut result if you apply a set of diagnostics for unaccusativity. For example, in French, impersonal *il* may appear with unaccusative predicates, and not with unergative predicates or attributive/identificational predicates, as shown by (127a)-(127d) (Schwartz 1993: 438):

(127) a. Il est arrivé un homme.
it is arrive:PSTP a man
'A man arrived'.

b. *Il a chanté un homme.
it has sing:PSTP an man
'A man sang'.

c. *Il est malade un homme.
it is ill a man
'A man is ill'.

d. *Il est un élève un écoliter.
it is a student a primary.student
'A primary student is a student'.

(127c,d) show that attributive/identificational predicates do not behave in the same way as typical unaccusative predicates, e.g. *arriver* 'arrive'. If one analyzed a sentence *John is tall* in the manner of (128), it would be difficult to explain why these attributional predicates do not behave like a typical unaccusative predicate:

(128) **tall'** (John)

Th.Rel.Tier: Patient

MR Tier: Undergoer

These considerations lead Schwartz tp propose the following alternative semantic analysis of identificational/attributive constructions:

(129) **be-at'** (John, tall)

Th.Rel.: Locative Theme

MR: Undergoer

Assuming that (129) is a plausible analysis of attributive/identificational constructions in Russian, we may account for why *vracom* 'doctor' in (123d) receives instrumental case. The reason is, simply, that it is a theme which is not assigned an undergoer value. This account extends to (123e) and (123f), both of which embed an attributive/identificational predicate:

(123) e. Oni nazvali ego Petrom.
3PL:NOM name:PAST him:ACC Peter:INSTR
'They named him Peter'.

f. Ja scitaju Sasu durakom.
1SG:NOM consider:PRES Sasha:ACC fool:INSTR
'I consider Sasha a fool'.

The LSs of (123e) and (123f) contain (130a) and (130b), respectively:

(130) a. **be-at'** (he, Peter)
b. **be-at'** (Sasha, fool)

Both *Petrom* 'Peter' in (130a) and *durakom* 'fool' in (130b) do not receive an undergoer value despite their status as theme. This suggests that (123e) and (123f) also fall within the scope of (117).

Let us proceed to (123g)-(123i), all of which involve secondary predication:

(123) g. My tancovali golymi.
1PL:NOM dance:PAST nude:INSTR
'We danced nude'.

h. On rabotaet vracom.
he:NOM work:PRES doctor:INSTR
'He works as a doctor'.

i. Anja poet solov'em.
Anja:NOM sing:PRES nightingale:INSTR
'Anja sings like a nightingale'.

If we may assume that (123g,h,i) contain (131a,b,c) in their LSs, we may also account for the instrumental cases in (123g,h,i):

(131) a. **be-at'** (we, nude)
b. **be-at'** (he, doctor)
c. **be-at'** (Anja, nightingale)

Golymi 'nude', *vracom* 'doctor', and *solov'em* 'nightingale' are themes which do not get an undergoer value. (117) correctly predicts that they receive instrumental case.

Finally, let us consider the following examples which involve "conjunct splitting". Russian does not use a bare instrumental form for representing these comitative cases.[38] Examples (132a)-(132e) come from Janda (1993: 183-184):

(132) a. Inzener resal etu zadacu
engineer:NOM solved that problem:ACC

so specialistom po komp'juteram.
with specialist:INSTR along computers:DAT

'The engineer solved that problem with a computer specialist'.

b. On borolsja/besedoval s bratom.
he:NOM fought/conversed with brother:INSTR
'He fought/conversed with his brother'.

c. Slepec s sobakoj peresel ulicu.
blind.man:NOM with dog:INSTR walked.across street
'The blind man crossed the street with a dog'.

d. Oxotnik posel na olenja s ruz'em
hunter:NOM went at deer:ACC with gun:INSTR
'The hunter went after the deer with a gun'.

e. My kupili divan s vysokoj spinkoj.
we:NOM bought couch:ACC with high back:INSTR
'We bought a couch with a high back'.

(132c,d) demonstrate that animacy and volition are not the only factors which contribute to a comitative interpretation; animals and even inanimate objects such as a gun may qualify as adjuncts of the subjects. The part-whole relation in (132e) licenses parts of a participant to be taken as accessories which accompany it in a comitative relationship (Janda 1993: 184).

The above analysis of (123a)-(123i) and (132a)-(132f) reveals that (117) may account for the major uses of instrumental case in Russian under the assumption that attributive/identificational constructions involve the association between thematic relations and macroroles in (129) and that in contrast to English, Russian uses a different form for comitative case. These observations require us to propose (133b) and make it ranked higher than (133a) in Russian and lower than (133a) in English:

(133) a. Instrumental Case (=117) [39]
Effectors with no actor value or themes with no undergoer value (i.e. effectors and themes with a non-macrorole value) get instrumental case.

b. Comitative Case
Effectors and themes which have a non-macrorole value and involve "conjunct splitting" get comitative case.

We term the case form*with* (in English) instrumental because of the CFP (59).

3.6.4 Japanese

This subsection investigates how many uses of the instrumental case in Japanese (117) may cover. Some Japanese examples follow:

(134) a. Taroo-ga naihu-de sakana-o kit-ta.
Taro-NOM knife-INSTR fish-ACC cut-PAST
'Taro cut the fish with a knife'.

b. Taroo-ga nuno-de tukue-o oot-ta.
Taro-NOM cloth-INSTR desk-ACC cover-PAST
'Taro covered the desk with a cloth'.

c. Taroo-ga mesi-o yasai-to/*de maze-ta.
Taro-NOM rice-ACC vegetable-COM/INSTR mix-PAST
'Taro mixed rice with vegetables'.

d. Taroo-ga Hanako-to/*de eiga-ni dekake-ta.
Taro-NOM Hanako-COM/INSTR movie-DAT go.out-PAST
'Taro went to the movie with Hanako'.

e. Taroo-ga gakusha-de at-ta.
Taro-NOM scholar-INSTR exist-PAST
'Taro was a scholar'.

f. Taroo-ga Hanako-o satujinhan-to/*de minasi-ta.
Taro-NOM Hanako-ACC murderer-QOT/INSTR find-PAST
'Taro found Hanako to be a murderer'.

g. Taroo-ga sono koinu-o Hanako-to/*de nazuke-ta.
Taro-NOM that puppy-ACC Hanako-QOT/INSTR name-PAST
'Taro named that puppy Hanako'.

h. Taroo-ga hadaka-de odot-ta.
Taro-NOM nude-INSTR dance-PAST
'Taro danced nude'.

i. Taroo-ga sakana-o nama-de tabe-ta.
Taro-NOM fish-ACC raw-INSTR eat-PAST
'Taro ate fish raw'.

j. Hanako-ga isha-toshite/*de hatarai-ta.
Hanako-NOM doctor-as/INSTR work-PAST
'Hanako worked as a doctor'.

Two points need to be made about (134a)-(134i). First, Japanese does not use instrumental case in small clauses as in (134f,g). Instrumental case in Japanese has somewhat restricted distribution than that in Korean. (134f) and (134g) instead use *to*, a marker of quotation that is homophonous with comitative case.[40] Second, Japanese has no instrumental case of comparison as illustrated in the Russian examples (123h) and (123i). The same roles are instead expressed by an analytic phrase such as *noyooni* 'like' and *toshite* 'as', as shown in (134j).[41]

Comparison of (123) and (132) with (134) reveals that comitative case is used in Japanese only when it marks arguments which undergo "conjunct splitting" as in (134c,d). The foregoing discussion suggests the following correspondences in English, Russian, and Japanese:

(135)

	Case Feature	Case Form
English	Instrumental	Instrumental
	Comitative	
Russian/Japanese	Instrumental	Instrumental
	Comitative	Comitative

3.6.5 Korean

Let us proceed to (136a)-(136j) (due to Heechul Lee, unless otherwise specified), which correspond to the Japanese examples (134a)-(134j), respectively:

(136) a. John-i yelsoy-lo mwun-ul yel-ess-ta.
John-NOM key-INSTR door-ACC open-PAST-DEC
'John opened a door with a key'.

b. John-i sikthak-ul sikthakpo-lo tep-ess-ta.
John-NOM table-ACC tablecloth-INSTR cover-PAST-DEC
'Minswu covered the table with a tablecloth'.

c. John-i chayso-lul pap-wa/*ulo sekk-ess-ta.
John-NOM vegetable-ACC rice-COM/INSTR mix-PAST-DEC
'John mixed vegetable with rice'.

d. John-i Mary-wa/*lo san-ul ol-lass-ta.
John-NOM Mary-COM/INSTR mountain-ACC climb-PAST-DEC
'John climbed the mountain with Mary'.

e. John-i uysa-ka/lo toy-ess-ta.
John-NOM doctor-NOM/INSTR become-PAST-DEC
'John became a doctor'.

f. Ku-ka Yumi-lul chencay-lo yeki-ko-iss-ta.
he-NOM Yumi-ACC genius-INSTR consider-PROG-be-DEC
'He considers Yumi a genius'. (Maling and Kim 1992: 55)

g. Yukwonca-ka ku-lul taythonglyeng-ulo ppop-ass-ta.
voter-NOM he-ACC president-INSTR choose-PAST-DEC
'The voters elected him president'. (Maling and Kim 1992: 55)

h. John-i nude-lo chwu-ess-ta.
John-NOM nude-INSTR dance-PAST-DEC
'John danced nude'.

i. John-i mwune-lul nalkes-ulo mek-ess-ta.
John-NOM octopus-ACC raw-INSTR eat-PAST-DEC
'John ate the octopus raw'.

j. John-i uysa-lo ilhay-ss-ta.
John-NOM doctor-INSTR work-PAST-DEC
'John worked as a doctor'.

There are a few notable differences between Japanese and Korean with respect to the usage of instrumental case. First, Korean, like Russian, may use instrumental or nominative case in attributive/identificational constructions, as illustrated by (136e). Japanese only allows instrumental case to show up in those constructions. Second, Korean never uses comitative case in attributive/identificational constructions, as illustrated in (136e)-(136j). Finally, Korean allows a few small clause constructions to exhibit double-accusative case frames (Y.-J. Kim 1990: 274), as illustrated by (137a,b):

(137) a. Nay-ka ai-lul uysa-lo/lul mantul-ess-ta.
1SG-NOM child-ACC doctor-INSTR/ACC make-PAST-DEC
'I made my child (as) a doctor'.

b. Inho-ka ku ai-lul chinkwu-lo/lul sam-ass-ta.
Inho-NOM that child-ACC friend-INSTR/ACC make-PAST-DEC
'Inho made that child (as) a friend'.

Interestingly, if one passivizes (137a) and (137b) as in (138a) and (138b) respectively, one may mark *uysa* 'doctor' in (137a) or *chinkwu* 'friend' in (137b) with instrumental case alone (Maling and Kim 1992: 55):

(138) a. Ai-ka uysa-lo/*ka mantul-eci-ess-ta.
child-NOM doctor-INSTR/NOM make-PASS-PAST-DEC
'My child was made a doctor'.

b. Ku ai-ka chinkwu-lo/*ka sam-aci-ess-ta.
that child-NOM friend-INSTR/NOM make-PASS-PAST-DEC
'That child was made a friend'.

If one is allowed to abstract away from the double-accusative case frames in (137a,b), one may come up with the following correspondences:

(139)

	Case Feature	Case Form
English	Instrumental	Instrumental
	Comitative	
Russian/Japanese/Korean	Instrumental	Instrumental
	Comitative	Comitative

(139) shows that English uses the instrumental case in the most extensive way among these languages, while Japanese uses the instrumental case in the least extensive way. Even if (117) turns out not to be universal, it is striking that (117) may capture all the major uses of instrumental case in Russian, English, Japanese, and Korean, in a unified way.

The above analysis of instrumental and comitative case in English, Russian, Japanese, and Korean demonstrates that it is necessary to base analyses of oblique cases on the combination of thematic relation and macrorole values (see Jolly 1993 and Whaley 1993 for RRG accounts of preposition assignments in English), since it makes it possible to show much more explicitly than previously what makes English, Russian, Japanese, and Korean different from each other with respect to the instrumental and comitative case assignment.

Finally, we are now in a position to consider how those constraints which license oblique cases interact with (46a)-(46d). Since it is necessary to have a larger number of constraints for oblique cases than (46a)-(46d), one might expect the number of possible rankings to be quite large. However, note that constraints must be ranked if and only if they are in conflict. Since those constraints which assign oblique cases apply only to non-macroroles, they are not ranked with respect to (46c) or (46d), which apply to macroroles.

As an illustration, let us consider how (46a), (46b), and (133a) are ranked in Korean, Icelandic, Imbabura Quechua, and Japanese. First, Korean ranks (46a) and (133a) above (46b), since it does not allow dative-marked objects to undergo passivization and get nominative case. Second, Icelandic has the same ranking of these three constraints as Korean, since it allows dative case to be preserved under passivization. Third, Imbabura Quechua allows instrumental/dative-marked NPs to be passivized and get nominative case. This suggests that it ranks (133a) and (46a) lower than (46b). Finally, Japanese ranks (46a) below (46b), so that dative-marked object NPs may receive nominative case under passivization. It also ranks (133a) above (46a,b), since (133a) always wins when they are in conflict. To summarize, we get the following rankings in the four languages:

(140) a. Icelandic, Korean (133a) > (46a) > (46b)
b. Imbabura Quechua (46b) > (133a) > (46a)
c. Japanese (133a) > (46a) > (46b)

A crucial question remains to be answered: how (133b) is ranked with respect to these constraints. First, (133b) is ranked higher than (133a) in Japanese, Korean, and Icelandic, all of which use different forms for representing instrumental and comitative case. Imbabura Quechua ranks (133b) below (133a), since as illustrated by (141a,b,c) Jake 1985: 25), (133a) takes care of what is covered by comitative case in Japanese, Russian, and Korean. It is interesting in this connection to consider Kabardian, a language which uses the same case form *-m* for all oblique NPs, as illustrated by (141d,e) (Smith 1992: 144). My proposal is that Kabardian ranks both (133a) and (133b) below (46a) and (46b), since they are never realized in the language:

(141) a. wambra-ca pala-wan alla-rca-mi
boy-TOP shovel-INSTR dig-3PAST-VAL
'The boy dug with the shovel'.

b. jari-ca warmi(-wan)-ga ri-rca-mi.
boy-TOP shovel-INSTR-TOP go-3PAST-VAL
'The man went with the woman'.

c. nuca-ca aruz-ta papa-wan micu-rca-ni-mi.
I-TOP rice-ACC potato-INSTR eat-PAST-1SG-VAL
'I ate rice with potatoes'.

d. ɬ'ə-m sə-da-lazáhs.
man-DAT SUBJ.1-COM.3-worked
'I worked (together) with the man'.

e. ɬ'ə-m sə-xa-lazáhs.
man-DAT SUBJ.1-BEN.3-worked
'I worked for (in the interest of) the man'.

To summarize the above discussion, we get the following rankings of (46a), (46b), (133a), and (133b) in Icelandic, Korean, Imbabura Quechua, Japanese, and Kabardian:

(142) a. Icelandic, Korean (133b) > (133a) > ... > (46a) > (46b)
b. Imbabura Quechua (46b) > (133a) > (46a) > ... > (133b)
c. Japanese (133b) > (133a) > ... > (46b) > (46a)
d. Kabardian (46a) > (46b) > .... > (133a), (133b)

(142a)-(142d) do not contain (46c) and (46d), since their rankings are orthogonal to these ranking.[42] Given that none of these five languages have a distinct case form for comitative

case unless they have a distinct case form for instrumental case, we may elaborate the lower portion of Silverstein's (1980/1993) case hierarchy (given in (57)) in the manner of (143):

(143) Case Hierarchy (Revised)

Nom : Dat_1 <------ {Acc, Erg} <------ Gen	Propositional & Adnominal
Dat_2 <------ Instr <------ Com	Adverbial & Propositional

The original case hierarchy in (57) states that a distinct case form for instrumental case implies a distinct case form for dative case. Elaborating on (57), (143) claims that a distinct case form for comitative case implies a distinct case form for instrumental case.

To summarize so far in this section, we may say that (133a) and (133b) constitute part of the universal inventory of case features in addition to (46a)-(46d):

(133) a. Instrumental Case
Effectors with no actor value or themes with no undergoer value (i.e. effectors and themes with a non-macrorole value) get instrumental case.

b. Comitative Case
Effectors and themes which have a non-macrorole value and involve "conjunct splitting" get comitative case.

3.6.6 Extension: Allative, Ablative, and Locative

The purpose of this subsection is to sketch out a possible extension. The focus is on another implicational relation in the lower portion of (57), which states that a distinct case form for locative case implies a distinct case form for dative case. This implicational relation remains to be elaborated, since what Silverstein (1980/1993) terms locative case form seems to include allative, ablative, and locative case form in the narrow sense. In order to facilitate the discussion that follows, I present two series of implicational relations among dative, allative, ablative, and locative case forms in (144):

(144) a. $Dative_2$ <------ Allative <------ Loc
b. $Dative_2$ <------ Ablative

Let us begin with (144a). The point of departure is Blansitt's (1988) typological work on the distribution of dative, allative, and locative case forms (to use my term), which may fruitfully be taken as supplementing (57). (145) is his proposal:

(145) **The Function Contiguity Hypothesis** [**FCH**]

Object - Dative - Allative -Locative

The functions [=case features] can be marked for function identically if and only if the identically marked functions are contiguous in the order above:

One of the predictions made by (145) is that no language marks dative and locative case in the same way to the exclusion of allative case. There are four possible situations:

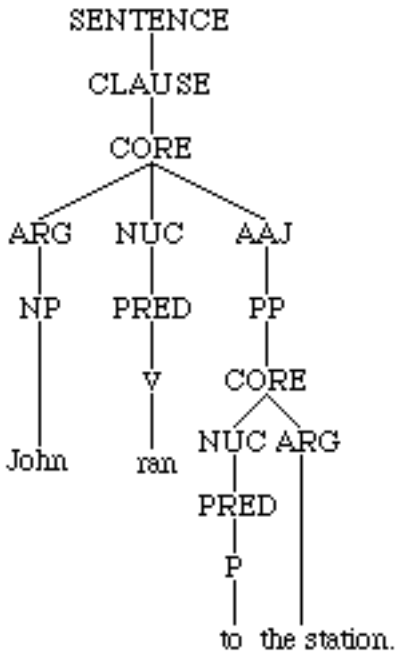
(146) a. The same case form represents dative, allative, and locative case: e.g. Japanese, French
b. The same case form represents dative and allative case to the exclusion of locative case: e.g. Lamani, Spanish, Acooli, English
c. The same case form represents allative and locative case to the exclusion of dative case: e.g. Alawa, Birom, Guugu Yimidhirr, Kalkatungu
d. Dative, allative, and locative case have distinct case forms: e.g. Hungarian

(146a)-(146d) are taken from Blansitt (1988). These data fully justify (144a).

The question now is how to license these three cases. (147a,b) are my proposal:

(147) a. Assign allative case to the inanimate, non-macrorole 'x' argument in the LS segment:
... BECOME/INGR **be-LOC'** (x, y)'.

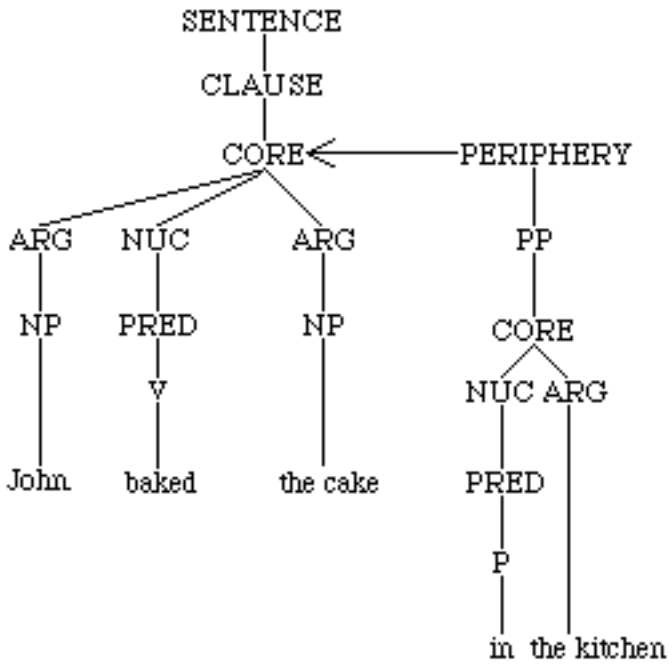
E.g. John ran *to* the station.



LS: **do'** (John, [**run'** (John)]) & BECOME **be-at'** (station, John)

(147) b. Assign locative case to the inanimate, non-macrorole 'x' argument in the LS segment:
... BECOME/INGR **be-at'/in'/into'/on'/near'** (x, y)'.

E.g. John baked the cake *in* the kitchen.



LS: **be-at'** (kitchen, [[**do'** (John, Ø)] CAUSE [BECOME **baked'** (cake)]])

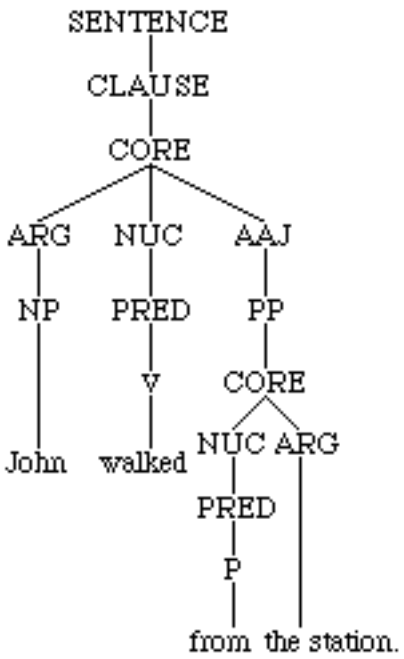
Korean provides a piece of evidence for (147b), since it marks animate and inanimate non-macroroles with *eykey* and *ey* respectively. I gloss over here a variety of locative cases, adessive (e.g. *at, on, near*), illative (e.g. *into*), inessive (e.g. *in*) and use the term locative case as an umbrella term. (146a)-(146d) are realized by the following rankings of (46a), (147a), and (147b):

(148) a. (46a) > (147a), (147b) (146a) [43]
b. (147b) > (46a) > (147a) (146b)
c. (147a) > (46a) > (147b) (146c)
d. (147b) > (147a) > (46a) (146d)

Finally, I assume that a distinct case for ablative case implies a distinct case form for dative case. The constraint which licenses ablative case is given in (147c) (see Jolly 1993):

(147) c. Assign ablative case to the non-macrorole 'x' argument in the LS segment:
... BECOME/INGR NOT **be-pred'** (x, y)

E.g. John walked *from* the station.



LS: **do'** (John, [**walk'** (John)]) & BECOME NOT **be-at'** (station, John)

The 'x' argument in (147c) may be animate or inanimate. The constraint (147c) is never in conflict with (147a) or (147b), since they apply to different inputs. This means that it is not necessary to rank (147c) with respect to (147a,b). The same may be said of the relation between (147a,b) and (133a,b). They are never in conflict and therefore do not have to be ranked with respect to each other. These series of implicational relations hold independently of each other. (149) describes the final version of case hierarchy:

(149) Case Hierarchy (Final)

Nom : Dat_1 <------ {Acc, Erg} <------ Gen	Propositional & Adnominal
Dat_2 <------ Instr <------ Com	Adverbial & Propositional
Dat_2 <------- All <-------- Loc	
Dat_2 <------- Abl	

From this, we may add (147a)-(147c) to the universal inventory of case features composed of (46a)-(46d), (133a), and (133b). I leave it for future research to verify the implicational relations in the lower portion of (149) cross-linguistically.[44]

3.7 Deriving Individual Case Systems

The goal of this section is to show that a particular ranking of (46) incorporates the whole range of case frames exhibited by simple sentences in Japanese and that the OT concept of dominance hierarchy provides a solution to the problem (45a1).

The majority of Japanese verbs license the case marking patterns which are typical of accusative languages, e.g. English, French, German. Regular case marking involves three cases: nominative, accusative, and dative case. Subjects are marked by nominative case in most instances, direct objects are marked by accusative case, and indirect objects are marked by dative case. Examples of this canonical pattern are given in (150)-(156):

Nom.

(150) Taroo-ga hayaku hashit-ta.
Taro-NOM fast run-PAST
'Taro ran fast'.

(151) Hune-ga oki-de sizun-da.
ship-NOM off.the.coast-INSTR sink-PAST
'The ship sank off the coast'.

(152) Hanako-ga Taroo-ni ker-are-ta.
Hanako-NOM Taro-DAT kick-PASS-PAST
'Hanako was kicked by Taro'.

(153) Hanako-ga Taroo-ni sakaraw-are-ta.
Hanako-NOM Taro-DAT disobey-PASS-PAST
'Hanako was disobeyed by Taro'.

Nom.-Acc.

(154) Taroo-ga Hanako-o ket-ta.
Taro-NOM Hanako-ACC kick-PAST
'Taro kicked Hanako'.

Nom.-Dat.

(155) Taroo-ga Hanako-ni sakarat-ta.
Taro-NOM Hanako-DAT disobey-PAST
'Taro disobeyed Hanako'.

Nom.-Dat.-Acc.

(156) Taroo-ga Hanako-ni okasi-o atae-ta.
Taro-NOM Hanako-DAT cake-ACC give-PAST
'Taro gave cakes to Hanako'.

(152) and (153) are the passive counterparts of (154) and (155), respectively. Lack of case preservation in Japanese, illustrated by (153), apparently undermines (46a)'s universality.

(157a)-(157e) are a list of inputs, i.e. a combination of thematic relations and macroroles value licensed by the verbs in (150)-(151) and (154)-(156), to which (84) applies:

(157) a. LS: **do'** (Taro, [**run'** (Taro)])
Th.Rel.: Effector
MR: Actor

b. LS: BECOME **sunk'** (ship)
Th.Rel.: Patient
MR: Undergoer

c. LS: [**do'** (Taro, ø)] CAUSE [INGR **kicked'** (Hanako)]
Th.Rel.: Effector Patient
MR: Actor Undergoer

d. LS: **do'** (Taro, [**disobey'** (Taro, Hanako)]) [1MR]
Th.Rel.: Effector Locus
MR: Actor Non-MR

e. LS: [**do'** (Taro, ø)] CAUSE [INGR **have'** (Hanako, cakes)]
Th.Rel.: Effector Locative Theme
MR: Actor Non-MR Undergoer

The associations between thematic relations and macroroles in (150)-(156) follow from MAP and AUH except for (155), which has the lexical feature [1MR]. MAP, then, requires that *sakarau* 'disobey' has an actor value, since it has an activity predicate ([**do'** (x,...)]) in its LS.

The constraint hierarchy (84) is repeated below for convenience:

(84) Case Marking Constraints (Accusative 2)
a. LS arguments take NOMINATIVE case.
b. Non-macroroles take DATIVE case.
c. Undergoers take ACCUSATIVE case.
d. Actors take ERGATIVE case.

(84d) may never be realized in Japanese under any circumstance, since actors are always marked by nominative case because of (84a), which outranks (84d).

Tables 1-6 show how the constraint hierarchy (84) applies to the inputs provided by (150)-(156) and outputs their (correct) case frames. (84a)-(84c) are ranked from left to right as columns of the table, while (84d) is dropped in all of Tables 1-6, since it is never realized (since it is always overridden by (84a)) and therefore plays no role in the Japanese case system:

Table 1. (150)

Candidates	(84a) >	(84b) >	(84c)
→ Nom.			
Dat.	*!		
Acc.	*!		

Case: Nom.
MR: Actor
Th.Rel. Effector

Table 2. (151), (152)

Candidates	(84a) >	(84b) >	(84c)
→ Nom.			*
Dat.	*!		
Acc.	*!		

Case: Nom.
MR: Undergoer
Th.Rel. Patient

Table 3. (153)

Candidates	(84a) >	(84b) >	(84c)
→ Nom.		*	
Dat.	*!		
Acc.	*!		

Case: Nom.
MR: Non-MR
Th.Rel. Locus

Table 4. (154)

Candidates	(84a) >	(84b) >	(84c)
→ Nom.-Acc.			
Nom.-Dat.			*!
Acc.-Nom.			*!
Dat.-Nom.			*!

Case: Nom. Acc.
MR: Actor Undergoer
Th.Rel.: Effector Patient

Table 5. (155)

Candidates	(84a) >	(84b) >	(84c)
Nom.-Acc.		*!	*
→ Nom.-Dat.			
Acc.-Nom.		*!	
Dat.-Nom.		*!	

Case: Nom. Dat.
MR: Actor Non-MR
Th.Rel.: Effector Locus

Table 6. (156)

Candidates	(84a) >	(84b) >	(84c)
→ Nom.-Dat.-Acc.			
Nom.-Acc.-Dat.		*!	*
Dat.-Acc.-Nom.		*!	*
Dat.-Nom.-Acc.		*!	
Acc.-Nom.-Dat.		*!	*
Acc.-Dat.-Nom.			*!

Case: Nom. Dat. Acc.
MR: Actor Non-MR Undergoer
Th.Rel.: Effector Locative Theme

(84) captures the common observation that every Japanese clause has to have, at least, one nominative-marked NP by ranking (84a) at the top of the constraint hierarchy. (84d) is omitted from Tables 1-6, since it never has any visible effect in Japanese. Tables 1-6 show that the constraint hierarchy (84) successfully yields all the case frames in (150)-(156). Table 3 highlights the need to introduce the concept of dominance hierarchy, since it would not be possible to resolve the conflict between the two constraints (84a) and (84b) otherwise.

Let us consider how the hierarchy (84) outputs the 'dat.-nom.' case frames in (158a)-(158c):

(158) a. Taroo-ni eigo-ga wakat-ta.
Taro-DAT English-NOM understand-PAST
'Taro understood English'.

b. Taroo-ni musume-ga i-ta.
Taro-DAT daughter-NOM exist-PAST
'Taro had a daughter'.

c. Taroo-ni kane-ga nakat-ta.
Taro-DAT money-NOM lack-PAST
'Taro lacked money'.

(158a)-(158c) exhibit a misalignment between grammatical relations and cases from the perspective of RelG (see, for example, Gerdts and Youn 1988 and Perlmutter 1984). The dative-marked NPs in (158a)-(158c) behave as pivot with respect to honorific agreement, reflexivization, and other syntactic processes (see Shibatani 1978). (158a)-(158c) may take the double-nominative case frame alternatively, as shown by (159a)-(159c):

(159) a. Taroo-ga eigo-ga wakat-ta.
Taro-NOM English-NOM understand-PAST
'Taro understood English'.

b. Taroo-ga musume-ga i-ta.
Taro-NOM daughter-NOM exist-PAST
'Taro had a daughter'.

c. Taroo-ga kane-ga nakat-ta.
Taro-NOM money-NOM lack-PAST
'Taro lacked money'.

I postpone a treatment of these double-nominative case frames until Chapter 5.

A word is in order about the association of thematic relations and macroroles in (158a)-(158c). I follow Van Valin (1991), Michaelis (1993), and others in assuming that these two-place verbs receive only one macrorole (see Ch.4 for detailed discussion). MAP, then, requires that (158a)-(158c) have an undergoer value, since they have no activity predicate in their LSs. (160) describes the input to the constraint hierarchy (84) provided by (158a)-(158c):

(160) LS: **understand'/have'/lack'** (x, y)
Th.Rel.: Experiencer/Locative Theme
MR: Non-MR Undergoer

Evaluation in (158) proceeds in two stages. First, the top constraint (84a) requires that there is one nominative-marked NP in every clause. This leaves us with four case frames: 'nom.-acc.', 'nom.-dat.', 'acc.-nom.', and 'dat.-nom.'. Second, the first three case frames violate (84b), while the 'dat.-nom.' case frame violates (84c). The fact that

(84b) is ranked higher on the AUH than (84c) and thus more important than (84c) leads (84) to select the 'dat.-nom' case frame as the optimal candidate. The point to note is that in order to satisfy (84a) and (84b), the lower-ranking constraint (84c) has to be violated.

Table 7 is a constraint tableau for (158a)-(158c):

Table 7. (158a)-(158c)

Candidates	(84a) >	(84b) >	(84c)
Nom.-Acc.		*!	
Nom-Dat.		*!	*
Acc.-Nom.		*!	*
⟶Dat.-Nom.			*

Case:	Dat.	Nom.
MR:	Non-MR	Undergoer
Th.Rel.:	Exp.	Theme

Table 7 indicates that the constraint hierarchy (84) allows us to explain non-subject and subject nominative cases in a unified way.

Finally, consider (161a,b), the passive counterparts of (156):

(161) a. Okasi-ga Hanako-ni ataer-are-ta.
cake-NOM Hanako-DAT give-PASS-PAST
'Cakes were given to Hanako'.

b. Hanako-ga okasi-o ataer-are-ta.
Hanako-NOM cake-ACC give-PASS-PAST
'Hanako was given cakes'.

Japanese is a **symmetric object language**; it allows ditransitive constructions to have two passives (see Alsina 1996, Baker 1988, Bresnan and Moshi 1990, and Woolford 1993 for discussion), as illustrated by (161a,b).[45] More examples are provided in (162b,c)-(165b,c):

(162) a. Taroo-ga Hanako-ni okasi-o okut-ta.
Taro-NOM Hanako-DAT cake-ACC send-PAST
'Taro sent cakes to Hanako'.

b. Okasi-ga Hanako-ni okur-are-ta.
cake-NOM Hanako-DAT send-PASS-PAST
'Cakes were sent to Hanako'.

c. Hanako-ga okasi-o okur-are-ta.
Hanako-NOM cake-ACC send-PASS-PAST
'Hanako was sent cakes'.

(163) a. Taroo-ga Hanako-ni okasi-o nage-ta.
Taro-NOM Hanako-DAT cake-ACC throw-PAST
'Taro threw cakes to Hanako'.

b. Okasi-ga Hanako-ni nager-are-ta.
cake-NOM Hanako-DAT throw-PASS-PAST
'Cakes were thrown to Hanako'.

c. Hanako-ga okasi-o nager-are-ta.
Hanako-NOM cake-ACC throw-PASS-PAST
'Hanako was thrown cakes'.

(164) a. Taroo-ga Hanako-ni okasi-o watashi-ta.
Taro-NOM Hanako-DAT cake-ACC hand-PAST
'Taro handed cakes to Hanako'.

b. Okasi-ga Hanako-ni watas-are-ta.
cake-NOM Hanako-DAT hand-PASS-PAST
'Cakes were handed to Hanako'.

c. Hanako-ga okasi-o watas-are-ta.
Hanako-NOM cake-ACC hand-PASS-PAST
'Hanako was handed cakes'.

(165) a. Taroo-ga Hanako-ni okasi-o simesi-ta.
Taro-NOM Hanako-DAT cake-ACC show-PAST
'Taro showed cakes to Hanako'.

b. Okasi-ga Hanako-ni simes-are-ta.
cake-NOM Hanako-DAT show-PASS-PAST
'Cakes were shown to Hanako'.

c. Hanako-ga okasi-o simes-are-ta.
Hanako-NOM cake-ACC show-PASS-PAST
'Hanako was shown cakes'.

Monomorphemic ditransitive verbs which have two passive counterparts include *iu* 'say', *tutaeru* 'communicate', *kuraberu* 'compare', and *osieru* 'teach'. This passive formation is also common with compound verbs, e.g. *tuukoku-suru* 'tell', *setumei-suru* 'explain', *osi-komu* 'put (with force)', *uti-akeru* 'confess', *wake-ataeru* 'distribute', *osie-komu* 'teach (with force)'.[46]

(161b)-(165b) pose a problem for the constraint hierarchy (84), since it only allows the theme and locative NP in these ditransitive constructions to get dative and nominative case, respectively. As it stands, (84) cannot license the case frames in (161b)-(165b). This is demonstrated by Table 8:

Table 8. (161a)

Candidates	(84a) >	(84b) >	(84c)
Nom.-Acc.		*!	*
→ Nom-Dat.			*
Acc.-Nom.		*!	
Dat.-Nom.		*!	*

Case:	Nom.		Dat.
MR:	Undergoer		Non-MR
Th.Rel.:	Theme		Loc.

(161b) should not be accepted, since the case frame in which the theme NP is accusative-marked, while the locative NP nominative-marked does not win in Table 8.

It is necessary to consider which ranking of (84a)-(84d) would produce the case frame shared by (161b)-(165b). The first and fourth case frame in Table 8 violate both (84b) and (84c), while the second (winner) and third one violate either (84b) or (84c). The only way to make (161b)-(165b)'s case frame optimal is to reverse the ranking of (84b) and (84c) as shown in Table 9, so that the third candidate may emerge as a winner in the competition:

Table 9. (161b)

Candidates	(84a) >	(84c) >	(84b)
Nom.-Acc.		*!	*
Nom-Dat.		*!	
→ Acc.-Nom.			*
Dat.-Nom.		*!	*

Case:	Acc.		Nom.
MR:	Undergoer		Non-MR
Th.Rel.:	Theme		Loc.

This is an example of 'reordering' version of tied constraints, introduced in Chapter 2.

The above discussion leads to the following proposal:

(166) Japanese allows (84b) and (84c) to tie when they are applied to case frames of ditransitive constructions.

(166) does not affect the case assignments in (162a)-(165a), since they satisfy both (84b) and (84c). In contrast, it affects the case assignments in (162b,c)-(165b,c), since they force either (84b) or (84c) to be violated under the assumption that (46e) dominates (84a)-(84d).

To summarize this section, I have illustrated how the OT concept of dominance hierarchy as a means to conflict resolution derives the Japanese case system, particularly (153), where (84a) and (84b) are in conflict, and (151)-(152), where (84a) and (84c) are in conflict. This provides a solution to the problem (45a1). The concept of dominance hierarchy allows us to maintain (84b) as a soft constraint even in Japanese, where it may be overridden by (84a). Furthermore, the OT concept of tied constraints allows us to explain why the Japanese ditransitive verbs in (161)-(165) may have two passive counterparts.[47]

3.8 Typological Extension

3.8.1 Typology in Optimality Theory

It may be useful at this stage to review what has been done in this chapter in light of the general methodology used in OT, which is summarized in (167):

(167) Typology in Optimality Theory

1. Hypothesize a universal set of possible structural descriptions (Gen).
2. Hypothesize a universal set of well-formedness constraints (Con).
3. Consider all possible rankings of the constraints into dominance hierarchies; these define the predicted set of possible language-particular grammars.
4. For each possible hierarchy, determine the well-formed structures of the corresponding language.

I have proposed the universal set of constraints in Section 3.4 and examined how they apply to complex sentences, e.g. control and raising constructions in Section 3.5. This corresponds to the second step in (167). I have also proposed the default hierarchy of the proposed constraints on the basis of typological distribution of case forms and their neutralization patterns. Section 3.6 illustrated how to extend the OT approach to oblique cases. Furthermore, I have shown in Section 3.7 that a particular ranking of the universal constraints (84) can derive the set of case frames for Japanese including the 'dat.-nom' case frame. This corresponds to the fourth step in (167), even if the range of constructions dealt with are restricted to simple sentences. We have also seen at the end of Section 3.4 a

variety of constraint rankings which yield the four major case systems, accusative, ergative, accusative-active, and ergative-active. However, it was left open whether they are the only possible case systems or not, and if not, what kind of case system is available. There is no doubt that these questions must be answered in order to prove the explanatory value of the proposed constraints (43a)-(43d). This corresponds to the third step in (167).

The OT account of the Japanese case system in the previous section may be a descriptive success, since it correctly predicts the major case frames in simple sentences in Japanese. In order to assess its value as an explanation, however, we should notice that it achieves these results with a single stipulation, i.e. the relative ranking of (46a)-(46d). It is important to recall that an individual grammar in OT is constructed by imposing a particular ranking on the constraint set. In order to prove that the constraint set (46), from which (84) is constructed, is explanatory in nature, one has to show that (46a)-(46d) are present universally. The standard test of the explanatory value in OT is to examine whether or not all possible rankings of (46a)-(46d) yield real or, at least, plausible (i.e. languages which have never been attested, but could exist or could have existed) languages.

It is important to note at this point that not every ranking is possible in current OT. Demuth (1995), Gnanadesikan (1995), Itô and Mester (1995), and Yip (1993) propose the following hypotheses with an eye toward restricting the range of constraint ranking:

(168) Ranking Invariance [48]
In the unmarked case, there is a single constraint ranking for the whole language which is mostly determined by markedness.

(168) predicts that the markedness hierarchy (80) is observed by every language as the default ranking. This turns out to be incorrect, at least, in the domain of case marking, however, since the active case systems rank (46c) or (46d) above (46b). This is a violation of the markedness hierarchy (80), in which (46c) and (46d) are outranked by (46b). The existence of active case systems, e.g. Basque, Acehnese, calls (168) into question. This shows that another principle is at work in addition to markedness as a determinant of constraint ranking.

3.8.2 Markedness Reversal in Dyirbal

In order to answer the question of what is responsible for the ranking reversal observed in active case systems, I will focus on Dyirbal, which displays a similar, but more complex reversal as shown in (19a)-(19d) and will show how to accommodate its reversal in the constraint set (46a)-(46d):

(19) a. balan ɖugumbil-Ø baŋgul yaɽa-ŋgu buɽa-n.
NM:NOM woman-NOM NM:ERG man-ERG see-TNS
'The man sees the woman'. (Actor=ERG, Undergoer=NOM)

b. ŋaɖa bayi yaɽa-Ø buɽa-n.
1SG:NOM NM:NOM man-NOM see-TNS
'I see the man'. (Actor, Undergoer=NOM)

c. ŋinda ŋayguna buɽa-n.
2SG:NOM 1SG:ACC see-TNS
'You see me'. (Actor=NOM, Undergoer=ACC)

d. ŋayguna baŋgul yaɽa-ŋgu buɽa-n.
1SG:ACC NM:ERG man-ERG see-TNS.
'The man sees me'. (Actor=ERG, Undergoer=ACC)

(19a)-(19d) illustrate a whole range of case frames available in transitive clauses which involve a pair of actor and undergoer in Dyirbal. In contrast to transitive clauses, which display the four-way alternation of case frames, intransitive clauses only allow their subjects to be left unmarked, as illustrated by (20a,b):

(20) a. ŋaɖa/ŋinda bani-ɲu.
1SG:NOM/2SG:NOM come-TNS
'I am coming/You are coming'.

b. balan ɖugumbil-Ø bani-ɲu.
NM:NOM woman-NOM come-TNS
'The woman is coming'.

(169) is a constraint hierarchy for Dyirbal, with its language-specific information in (169) italicized. Tables 10 and 11 are the constraint tableaus for (19b) and (19d):

Table 10. (19b)

Candidates	(169a)	(169b)	(169c)	(169d)
Erg -Nom.			*	
Erg.-Acc.		*	*	*
→Nom.-Nom.				
Nom.-Acc.		*		

Case: Nom. Nom.
MR: Actor Undergoer
Th.Rel: Experiencer Theme

Table 11. (19d)

Candidates	(169a)	(169b)	(169c)	(169d)
Erg -Nom.		*		
→Erg.-Acc.				*
Nom.-Nom.		*	*	
Nom.-Acc.			*	

Case: Erg. Acc.
MR: Actor Undergoer
Th.Rel: Experiencer Theme

(169) Case Marking Constraints (Dyirbal)
a. Non-macroroles take DATIVE case.
b. *First and second person transitive* undergoers take ACCUSATIVE case.
c. *Third person transitive* actors take ERGATIVE case.
d. LS arguments take NOMINATIVE case.

I will show later in this section that the language-particular information in (169b,c) is derived from a general principle of cognition and does not have to be put in each constraint.

Putting language-particular information in (169b) (=(46c)) and (169c) (=(46d)) is licensed by the fact that (46c) and (46d) are more marked than (46a) or (46b) in the default hierarchy (80). The dotted lines in Tables 10 and 11 show that (169a)-(169c) are not ranked with respect to each other.

The competitions in Tables 10 and 11 proceed as follows. Both arguments in (19b) get nominative case, since there would otherwise be a violation of (169b) and (169c). In contrast, (19d)'s input to (169) is the third person actor and the first person undergoer. This input satisfies both (169b) and (169c). (169d) has to be violated in order to satisfy these two higher-ranking constraints. The same procedure applies to (19a) and (19c).

There are two facts to be explained in (169): the defective distribution of accusative and ergative case and ranking reversal. They remain simply stipulated in (169). The standard explanation for split ergativity along the line of Silverstein (1976) is that ergative case on the third person actor shows the markedness of its serving as actor, while accusative case on the first/second person undergoer signals the markedness of its serving as undergoer. That is, the third person actor receives ergative case, since it is less expected in that context, while the first/second person undergoer receives accusative case for the same reason. This situation is summarized in (170), in which the marked cases correspond to marked semantic contents:

(170) Form-Content Alignment in Dyirbal Transitive Clauses

Actor		
Case:	Marked <---------->	Unmarked
	(Erg.)	(Nom.)
Semantic Content:	Marked <---------->	Unmarked
	(3rd person)	(1st, 2nd person)
Undergoer		
Case:	Marked <---------->	Unmarked
	(Acc.)	(Nom.)
Semantic Content:	Marked <---------->	Unmarked
	(1st, 2nd person)	(3rd person)

(171) Split Ergativity = Markedness Assimilation [49, 50]
Split-ergative case systems involve markedness assimilation (Andersen 1972) or markedness reversal, which brings about ranking reversal as in (166).

(170) describes the form-content alignment in Dyirbal transitive clauses. This is a typical example of markedness assimilation or reversal, which represents two clusters of the opposite markedness values: unmarked cases are associated with unmarked semantic contents, while marked cases are associated with marked semantic contents.

What is characteristic of Dyirbal and many other split-ergative case systems is that the markedness assimilation occurs only in transitive clauses, i.e. only when both actor and undergoer occur in the same core. The default ranking (80) prevails in intransitive clauses, since there is no conflict about the perspective-taking in intransitive clauses. We may extend (171) to other parameters concerning semantic/pragmatic contents of NPs and clauses in which they occur as in (172): actors or undergoers in transitive clauses may be

marked by the marked case, rgative or accusative, when one or all of these co-occurring features are not naturally correlated with actors or undergoers (Croft 1988):

(172)

	Actor	Undergoer [51]
Ego-centricity:	1st, 2nd person	3rd person
Agentiveness:	Animate	Inanimate
Definiteness:	Definite, Specific	Indefinite, Non-Specific
Topicality:	Pronouns	Lexical NPs
Aspect:	Imperfective	Perfective
Tense:	Non-Past	Past

For example, Hindi marks transitive undergoers with accusative case which deviate from the prototype in three ways: those in imperfective clauses which are not animate or definite (Mohanan 1990). It is up to languages which parameter(s) they select and, if they do, how they combine those parameters. Hindi chooses three parameters and combines two of them (definiteness and animacy) disjunctively. For other combinations of the parameters which are responsible for split-ergativity, I refer the reader to Dixon (1994).

3.8.3 What Causes Markedness Reversal?

The explanation of split-ergative patterns in terms of markedness assimilation has been widely accepted in the literature. It is, however, tempting to derive it from a more general principle. My proposal is that it is necessary to appeal to **iconicity** in the sense of Peirce (1965-66) in order to provide a systematic explanation for split patterns. The role of markedness has been emphasized in OT, but I propose that like most constraints in OT, it may be violated when it competes with iconicity.

The intuition behind the concept of iconicity is that linguistic forms reflect their semantic contents in some way. Few individual linguistic signs are iconic to any degree, but iconicity may appear in the ways combinations of forms are related to their semantic contents. This is termed **diagrammatic iconicity** (see Bybee 1985). The simplest linguistic example would be a pair of the singular and plural form of nouns. As shown in (173), the singular form is generally shorter than the corresponding plural form. (174) is my proposal:

(173) Example of Diagrammatic Iconicity (e.g. "More" is "More")

Form:	car	car-s
Content:	singular	plural

(174) Markedness Assimilation = Diagrammatic ("Relational") Iconicity
Case systems with a split pattern as in Dyirbal involve diagrammatic iconicity, a type of iconicity which applies to the ways combinations of cases are related to the semantic content/pragmatic status of NPs which they mark.

(174) is based on the proposal by Andersen (1972) and Shapiro (1983, 1991) to include a parallelism between markedness relations as in (1) as well as conceptual ones as in (173) under the rubric of iconicity. The relation of case and its semantic content itself is arbitrary, but their relations may be aligned with each other. It is important to note that in order to realize the parallel alignment in (173), it is necessary to rank (46c) and (46d) above (46b) in violation of the markedness hierarchy (80) in appropriate contexts as shown in (172).

The major consequence of deriving a split-ergative pattern from the interaction between markedness (168) and iconicity (174) is that it obviates the need to refer to language-specific information in (169c) and (169d) or stipulate ranking reversal, as in (169). There are only two things to specify in describing a split-ergative case system: that iconicity is at work in that language and what kind of semantic/pragmatic parameter(s) a language chooses, e.g. animacy, definiteness, ego-centricity, imperfective. For Dyirbal, one only has to specify that it selects ego-centricity as a parameter.

(175) Case Marking Constraints (Dyirbal)

a. Non-macroroles take DATIVE case.
b. LS arguments take NOMINATIVE case.
c. Undergoers take ACCUSATIVE case.
d. Actors take ERGATIVE case.

Parameter:	Ego-centricity (1st/2nd persons <---> 3rd persons)
Markedness Assimilation:	Yes

Subjects of intransitive clauses normally receive nominative case, since (175b) is ranked higher than (175c,d). In contrast, (175c,d) undergo re-ranking in transitive clauses: (175c) is ranked higher than (175a,b) if transitive clauses have first or second person undergoers, while (175d) is ranked higher than (175a,b) when they have third person actors. (175c,d) undergo these re-rankings in order to realize the markedness assimilation in (170).

We may likewise describe the case systems of French and Turkish. Their split patterns are realized in (81a) (Turkish) and (81b) (French):

(81) a. Ali kutu/kutu-yu yap-tı.
Ali:NOM box:NOM/box-ACC make-PAST
'Ali made boxes/the boxes'.

b. Marie t'aime.
Marie:NOM you:ACC-loves
'Marie loves you'.

To repeat the point, French allows only pronominal undergoers in transitive clauses to be accusative-marked, while Turkish allows only specific undergoers in transitive clauses to receive accusative case. Given (172), we may describe the association of cases and their semantic contents in transitive clauses in these languages as follows:

(176) Form-Content Alignment in French Transitive Clauses

Undergoer
Case: Marked <----------> Unmarked
(Acc.) (Nom.)
Semantic Content: Marked <----------> Unmarked
(Pronouns) (Lexical NPs)

Case Marking Constraints (French)
a. LS arguments take NOMINATIVE case.
b. Non-macroroles take DATIVE case.
c. Undergoers take ACCUSATIVE case.
d. Actors take ERGATIVE case.

Parameter: Topicality (Pronouns <---> Lexical NPs)
Markedness Assimilation: Yes

(177) Form-Content Alignment in Turkish Transitive Clauses

Undergoer
Case: Marked <----------> Unmarked
(Acc.) (Nom.)
Semantic Content: Marked <----------> Unmarked
(Specific) (Non-Specific)

Case Marking Constraints (Turkish)
a. Non-macroroles take DATIVE case.
b. LS arguments take NOMINATIVE case.
c. Undergoers take ACCUSATIVE case.
d. Actors take ERGATIVE case.

Parameter: Specificity (Specific <---> Non-Specific)
Markedness Assimilation: Yes

As in Dyirbal, the distinction between accusative and nominative case is neutralized on intransitive subjects. There is no case alternation on transitive actors as in Dyirbal, since neither language has ergative case; otherwise, the split patterns displayed by French and Turkish may be treated on a par with those exhibited by Dyirbal.

We are now ready to answer the objection raised at the end of Section 3.4.3 that it is possible to regard the nominative case form on *kutu* 'box' in (81a) as an allomorphic form of accusative case (as case feature). An analogous objection may be raised against my treatment of (81d). It may be helpful here to compare these splits with a typical instance of case syncretism. (178) presents a paradigm of German definite articles:

(178)

	Masculine		Feminine		Neuter	
Nom.	der	Mann	die	Frau	das	Kind
Gen.	des	Mann[e]s	der	Frau	das	Kind[e]s
Dat.	dem	Mann	der	Frau	dem	Kind
Acc.	den	Mann	die	Frau	das	Kind

Two observations are in order. First, the case form *der* is used to mark nominative case (as case feature) on masculine nouns and genitive and dative case on feminine nouns. Second, the case form dem marks dative case (as case feature) on masculine and neuter nouns, but not dative case on feminine nouns. These idiosyncrasies contrast sharply with the French and Turkish data in (81a)-(81d). The alternations in (81) are not idiosyncratic, but are governed systematically by definiteness and topicality. The foregoing consideration leads us to the following principle (cf. Mohanan 1993):

(179) A split in a case-marking system may be regarded as an instance of case syncretism only when it involves lexical idiosyncrasies which may not be attributed to any general semantic and/or pragmatic factor(s).

(179) requires us to analyze those splits in the French, Turkish, and Dyirbal case systems as involving markedness assimilation, and not as instances of case syncretism.

I will extend the analysis of split ergativity in the last section and will propose that the typological variation of case systems arises from the interaction between markedness and iconicity. This proposal will be generalized to the claim that the range of constraint ranking is determined by the competition among grammar-external motivations.

3.8.4 How to Restrict Constraint Ranking

The first question is how to relate markedness with iconicity. My suggestion is to see markedness as a reflection of **economy**, i.e. a tendency to use as few resources (in this case, the inventory of case forms) as possible. I assume that markedness is more than a formal property of grammar. Given that it is reasonable to think of iconicity as a "performance" concept, following Anttila (1977) and others, we may regard the typology of case systems as a tradeoff between economy and iconicity, which may be comparable to a tradeoff between ease of articulation and ease of perception in phonology (see Lindblom 1990). If economy predominates, the markedness hierarchy (81) remains intact. Then, across-the-board accusative/ergative case systems will emerge. In contrast, if iconicity predominates, (80) is reversed as in (86) and (87). Then, active case systems such as Basque and Acehnese will show up. These functional motivations show up in individual grammars not directly, but through constraint ranking. (180) describes the form-content alignment in Basque, which exhibits a much more direct parallelism between cases and their semantic contents than that in Dyirbal:

(180) Form-Content Alignment in Basque

Case:	Ergative <----------> Nominative
Lexical Content:	Actor <----------> Undergoer

Basque displays a much more direct parallelism than Dyirbal, since the iconic relationship holds throughout the language. That is, it manifests itself in both intransitive and transitive clauses. Split-ergative case systems such as Dyirbal and Hindi fall between "across-the-board" accusative/ergative systems and active systems, since they display iconicity only in transitive clauses.

Split-ergative and active case systems bring to light the interaction between economy and iconicity and force us to see case systems as an example of **competing motivation** in the sense of DuBois (1985, 1987) and Haiman (1985). This further leads us to propose (181) (Nakamura forthcoming) as an alternative to (182), which has so far been adopted by the standard OT:

(181) Functionalist Hypothesis
Constraint ranking is limited by a number of functional motivations extrinsic to grammar, most notably economy and iconicity. Typological variation arises from the way of solving conflicts among these functional motivations.

(182) Formalist Hypothesis
The source of typological variation lies in the representation of grammar and the set of principles which govern the representation.

It is not difficult to see that the standard OT shares with parametric accounts the assumption that the source of typological variation and explanatory value lies in the representation of grammar itself, and not in language function.

There are two major merits of incorporating (181) into OT. First, these functional principles, economy and iconicity, provide a non-vacuous way of restricting the range of rankings of (46a)-(46d), since they correctly exclude one logically possible type, non-economic and non-iconic rankings, as shown in (183). In contrast, (182) provides no means to exclude those non-attested rankings:

(183) Predicted Typology

* indicates an unattested type

(46a) > (46c) > (46d) > (46b)	1	(46b) > (46c) > (46d) > (46a)*
(46a) > (46d) > (46c) > (46b)		(46c) > (46b) > (46d) > (46a)*
(46c) > (46a) > (46d) > (46b)		(46b) > (46d) > (46c) > (46a)*
(46c) > (46d) > (46a) > (46b)		(46d) > (46b) > (46c) > (46a)*
(46d) > (46a) > (46c) > (46b)		(46c) > (46d) > (46b) > (46a)*
(46d) > (46c) > (46a) > (46b)		(46d) > (46c) > (46b) > (46a)*
(46a) > (46b) > (46c) > (46d)	2	(46a) > (46b) > (46d) > (46c) 4
(46b) > (46a) > (46c) > (46d)?		(46b) > (46a) > (46d) > (46c)*
(46a) > (46c) > (46b) > (46d)	3	(46a) > (46d) > (46b) > (46c) 5
(46c) > (46a) > (46b) > (46d)		(46d) > (46a) > (46b) > (46c)
(46b) > (46c) > (46a) > (46d)*		(46d) > (46b) > (46a) > (46c)*
(46c) > (46b) > (46a) > (46d)*		(46b) > (46d) > (46a) > (46c)*

1. Split-Ergative
2. Accusative
3. Accusative-Active
4. Ergative
5. Ergative-Active

These 24 (=4!) rankings group around only five distinct case systems. The only exception is (84), a small number of accusative case systems including Japanese, French, and Imbabura Quechua which correspond to the ranking marked by a question mark in (183).

Another major merit of (181) is that we may keep the constraint set (46) universal, leaving the major typological variations determined by economy and iconicity.

To conclude, I have shown that OT allows us a systematic typology of case systems including split-ergative ones. The key is to incorporate iconicity as well as economy (which represents markedness) into OT as a determinant of constraint ranking and make both functional principles compete with each other.

3.9 Conclusion

This chapter is devoted to outlining a general theory of case and its scope. Sections 3.2 and 3.3 provided a summary and review of Van Valin (1991) and Van Valin and LaPolla (in press). Section 3.4 proposed the universal set of constraints for nominative, dative, accusative, and ergative case assignment. This proposal was extended in Section 3.5 from simple sentences to complex sentences such as control and raising constructions. It was illustrated in Section 3.6 how to accommodate oblique cases. It was shown that the framework adopted may provide a principled account of the oblique case assignment by referring to the two-tiered semantic representation of verbs. Section 3.7 showed that the proposed constraints may handle the whole range of simple sentences in Japanese. Finally, it was demonstrated in Section 3.8 that the proposed set of constraints are not only adequate descriptively, but also explanatorily, since it is possible to constrain the range of possible case systems by appeal to two functional factors, economy and iconicity.

Notes

1. One might add **panstratal** (Whaley 1990) to the list of multistratal relations:

> **Panstratal Nuclear Term**
> A nominal is a panstratal nuclear term of clause b if and only if it heads a nuclear term arc in all strata of b.

The definitions of working 1 and metastratal 1 are given below:

> **Working 1**
> A nominal is a working 1 of clause b if and only if it heads a 1 arc in some stratum and a term arc in the final stratum.

> **Metastratal 1**
> A nominal is a metastratal 1 of clause b if and only if it heads a 1 arc in some stratum.

See Ladusaw (1988) for discussion of the distinction between **strata** and **levels**.

2. See Kroeger (1993: 47-48) and Schachter (1996) for evidence against the ergative analysis proposed, for example, by Gerdts (1988b).

3. See Bailyn (1991) and Greenberg and Franks (1991) for attempts to license dative and other oblique cases on the basis of configurational information.

4. There seems to be no point in applying concepts such as **radial category** (Lakoff 1987) to cases such as dative and instrumental case whose semantic contents are very schematic (see Janda 1993 for illustration of this approach).

5. The focus here is on nominative, accusative, ergative, and dative case.

6. Quirky cases mark subjects and objects in an unexpected manner, i.e. dative/genitive/accusative subjects and dative/genitive objects.

7. This hierarchy may be taken as representing accessibility to **a-structure subject** [**a-subject**] (Manning 1996), which controls reflexivization and binding. RRG defines accusativity and ergativity on the basis of the relative ranking of actor and undergoer. If actor has priority over undergoer in languag/construction X when they are in competition, then X is syntactically accusative. On the other hand, if undergoer has priority over actor in language/construction Y, Y is defined as syntactically ergative.

8. An alternative would be to propose that verb agreement is controlled by the highest grammatical relation with nominative case. The problem here is that both case and agreement serve the same function: to signal the relations between a verb and its thematic dependent(s). They must be defined in terms of something else, syntactic or semantic.

9. Basque allows undergoers to be marked by partitive case if they are in the scope of negative quantification (Ortiz de Urbina 1989). I have to leave it for further research how to handle genitive/partitive case which show up in those contexts. See also Belletti (1988), King (1995: Ch.8), Neidle (1988: Ch.2), and Timberlake (1986) for various accounts of partitive/genitive case on undergoers.

10. Accusative case systems involve some complications because of a variety of raising constructions. See Section 3.5.2 for discussion.

11. This does not explain why there are some languages, e.g. Japanese, Imbabura Quechua (Jake 1985), Modern Greek (Joan Maling electronical communication) which allow two passives of ditransitive constructions:

Taroo-ga okasi-o ataer-are-ta.
Taro-NOM cake-ACC give-PASS-PAST
'Taro was given cakes'. (Japanese)

rucu-ca micuy-ta cara-shca ca-rca.
old-TOP food-ACC serve-PAST be-3SG:PAST
'The old man was served food'. (Imbabura Quechua)

This is not what one would expect under (26). These languages stand in contrast to languages such as Icelandic, which do not allow non-macroroles to bear nominative case (Collberg 1986: 71):

Sigga stal bílnum.
Sigga:NOM stole the.car:DAT
'Sigga stole the car'.

Bílnum var stolið.
the.car:DAT was stolen
'The car was stolen'.

A treatment of this symmetric object construction will be proposed in Section 3.7.

12. I have no information about whether or not there is any ergative or active language that allows non-macroroles to receive nominative case, for example, under passivization.

13. *Désobeir* 'disobey', *pardonner* 'pardon', and *consentir* 'consent' behave exactly the same way as *obéir* 'obey' (Smith 1992: 319). Sugimoto (1991) cites more than twenty Japanese verbs with dative-marked objects which may be promoted to nominative subjects under passivization. See Jake (1985: 53-74) for syntactic evidence that the unmarked passive agents in (30b) and (31b) do not have subject status.

14. K.-S. Park (1995) proposes an alternative RRG account of some of (32)-(42). I postpone criticism of his proposals until Chapters 5 and 6.

15. Van Valin and LaPolla (in press) share this problem with Zaenen et al. (1985) (LFG) (see Andrews 1990a, however, for an exception) and Sag et al. (1992) (HPSG; see also Pollard 1994).

16. (46a)-(46d) hold only in languages which have case-marking systems. They do not apply to Bantu languages or Chinese, for example. In this respect, (46a)-(46d) are different from the GB case theory, which assumes that every language has abstract Cases such as nominative and accusative.

17. I will show in Section 3.5.1 that (46a)-(46d) should apply directly to LS arguments, and not to syntactically realized core arguments of a verb.

18. Under my proposal, nominative is the default case for arguments in general, while dative is the default case for non-macrorole arguments/adjuncts. This is different from Van Valin (1991), who claims that dative is the default case for core arguments.

19. It is important to emphasize here that dative case (as case feature) represents non-macrorole arguments/adjuncts. Dative case fails to show up when constraints which assign more specific case features, e.g. allative, instrumental, ablative, are ranked higher than (46a). See the end of Section 3.6 for further discussion.

20. Cognate object constructions pose a problem about accusative case assignment, since cognate objects seem to behave like adjuncts (Jones 1988, Macharland 1996, Massam 1990). A few Korean examples are given below (O'Grady 1991: 233):

Ku pwun-i cam-ul ca-ss-ta.
that one-NOM sleep-ACC sleep-PAST-DEC
'He slept a sleep'.

Ku pwun-i chwum-ul chwu-ess-ta.
that one-NOM dance-ACC dance-PAST-DEC
'He danced a dance'.

I have no novel proposal about the treatment of these cognate object constructions. I follow Massam (1990) in assuming the following lexical rule to account for the contrast between the third sentence and the sentence given below:

Ku pwun-i sei sikan-tongan chwu-ess-ta.
that one-NOM three hour-for dance-PAST-DEC
'He danced for three hours'.

[**do'** (x, [**dance'** (x)])] ----> [[**do'** (x, [**dance'** (x)])] CAUSE
[BECOME **exist'** (z)]]

This lexical rule accounts for why the noun *chwum* 'dance' takes accusative case, since it occupies the argument slot 'z' in the lexical rule which is a patient-undergoer in RRG terms. It has also been claimed that cognate object constructions normally do not undergo passivization. However, this is factually false. The following pair are taken from Japanese:

Hanako-ga utukusii odori-o odot-ta.
Hanako-NOM beautiful dance-ACC dance-PAST
'Hanako danced a beautiful dance'.

Utukusii odori-ga Hanako-niyotte odor-are-ta.
beautiful dance-NOM Hanako-by.means.of dance-PASS-PAST
'A beautiful dance was danced by Hanako'.

The second sentence illustrates that at least some cognate objects do undergo passivization. See also Macharland (1996) in this connection for discussion of the passivizability of cognate object constructions in English.

21. See note 49 of Chapter 5, however. See also Maling (1989, 1993) and Smith (1992) for accounts of these accusative cases. Smith analyzes these accusative cases as the "default" case, on the grounds that it is not possible to identify what is shared by the examples in (53). However, the fact that accusative case in (53a) turns into nominative case

under passivization casts doubt on Smith's (1992) claim that these accusative cases are assigned as the default, since default cases normally do not alternate with other cases.

22. There are many split-ergative languages which use the same case form for ergative case and some oblique cases, e.g. ablative case, instrumental case. I assume that this homonymy is motivated by the fact that they represent source.

23. Case features are sometimes termed **case relations** (e.g. Silverstein 1980/1993). I also use here the term case form and **case marking** interchangeably. See Blake (1994), Comrie (1991), Goddard (1982), Mohanan (1993), and Wierzbicka (1983) for arguments for making a principled distinction between case features and forms.

24. This implicational relation hold not only crosslinguistically, but language-internally. It often happens that lexical NPs displays a two-way case marking system which uses nominative and dative (or oblique), while pronouns exhibit a three-way case system which uses nominative, dative, and accusative (e.g. Bulgarian, Rumanian). It is also interesting to note that the order of case form loss seems to follow the order which reverses the implicational relations in (57): genitive ---> accusative ---> dative (e.g. English).

25. I regard the Palauan preposition *er* as dative, and not as accusative case form, since there is no language which distinguishes undergoers alone from all other NPs, arguments or adjuncts. In other words, a language has to have a distinct dative case form, in order to have a distinct accusative case form.

26. Yaghnobi has both accusative constructions and ergative constructions (in past tenses). It marks specific direct objects (accusative) and transitive subjects (ergative) only in accusative and ergative constructions, respectively (Comrie 1981b).

27. It might be tempting to propose that *sa* is a locative marker, while *ng* is a dative case form. This is a possibility suggested by Van Valin (personal communication). I do not adopt this classification for the following two reasons:

1. *Sa* marks recipients in ditransitive constructions. This is the most typical use of dative case.
2. *Ng* marks instruments. Many ergative languages use the same case form for ergative case and instrumental case feature.

28. Kroeger (1993) uses a label "genitive", while De Guzman (1995) uses a hyphenated label of 'ergative/genitive'. It is unclear what justifies their labels. See Johns (1992) for an attempt to assimilate ergative case in Eskimo languages to genitive case. This attempt is motivated by the fact that it is hard to tell verbs from nouns in those languages.

29. See Croft (1991: 206-212) for an explanation of why neutralizations between accusative and genitive case are rare. See Blake (1994: 158), however, who notes that Classical Arabic exhibits a partial neutralization between these two case features.

30. The causee NP in (88) may also be marked by *par* 'by'. See Chapter 7 for its treatment.

31. LSs in which the same variable corresponds to two LS arguments, e.g. *walk*: [**do'** (x, [**walk'** (x)])] & BECOME **be-at'** (y, x), presents a challenge to (90). I assume that the case assigned to the thematically higher argument (in this case, effector) is assigned to the thematically lower argument (in this case, theme).

32. Dative-marked NPs may not host quantifier floating in a simple clause.

33. Subject-to-object raising constructions in Korean are different from the English counterparts, in that they allow raising from finite clauses which may contain tense and modality markers (Yang 1994). I leave it for further research how to incorporate this raising construction into the RRG theory of clause linkage (they are exceptional in that they involve sharing of a core argument between the matrix core and the embedded clause).

34. See Hong (1990) and Yoo (1993) for evidence that *haksayng* 'student' in (105b) belongs to the matrix core (see Sells 1990 for discussion of the Japanese counterparts). See also Wechsler and Lee (1995), who argue that the embedded predicate of ECM constructions must denote an individual level property of the ECMed NP.

35. This is the RRG adaptation of Jackendoff's (1992) **cs-superiority**.

36. This proposal does not fare worse than the standard GB account (**exceptional Case-marking**), in that it treats "raising" from finite clauses as observed in Korean and Japanese on a par with "raising" from infinitival clauses, since they show no difference on the level of logical structure. The exceptional case-marking account has to make a further stipulation in order to assign accusative case to the subject of the finite complement.

37. See Channon (1982) and Bailyn and Rubin (1991) for a RelG and GB account of instrumental case assignment. The latter paper attempts to assign instrumental case (in Russian) configurationally, but excludes examples such as (123a)-(123c).

38. Comitative case is defined as "indicating an individual in whose company something is done" (Trask 1993: 49).

39. Russian uses instrumental case more extensively than is suggested by (123): manner, space, time, passive agents, and sensation as well (Janda 1993: 163, 166, 167):

Dvor paxnet senom.
yard:NOM smells hay:INSTR
'The yard smells of hay'.

Oni prosli prostornoj, svetloj komnatoj.
they:NOM walked.through spacious, bright room:INSTR
'They walked through a spacious, bright room'.

Dorogoj on cital.
road:INSTR he:NOM read
'While traveling he read'.

These uses of instrumental case are beyond the scope of the LS-based account, since they do not mark themes or effectors with a non-macrorole value. One possible way to deal with this diversity would be to assume that instrumental case is, like dative case, a default case of some sort (probably) for non-macrorole adjuncts. However, this begs a question of how instrumental and dative case interact, since they apply to the same range of inputs. Another way is to explore semantic connections among those uses of instrumental case (see Janda 1993 and Wierzbicka 1980). I have to leave it to another occasion how to handle them.

40. The usage of *to* as a quotation marker and that of *to* as comitative case form a continuum, as shown by the following examples:

Taroo-ga jibun-wa byooki-da-to it/kii-ta.
Taro-NOM self-TOP sick-be-CMPL say/hear-PAST
'Taro said/heard that he was sick'.

Taroo-ga jibun-wa byooki-da-to wakat-ta.
Taro-NOM self-TOP sick-be-CMPL realize-PAST
'Taro realized that he was sick'.

Taroo-ga byooki/yoogisha dat-ta-to wakat-ta.
Taro-NOM sick/suspect be-PAST-CMPL turn.out-PAST

Taroo-ga byooki/yoogisha-to wakat-ta.
Taro-NOM sick/suspect-CMPL turn.out-PAST

'Taro turned out to be sick/a suspect'.

Taroo-ga yoogisha-ni/to/*yoogisha-da-to nat-ta.
Taro-NOM suspect-DAT/COM/suspect-be-CMPL become-PAST
'Taro became a suspect'.

The last example sounds archaic, but it is still acceptable. Since this usage of *to* is not predictable on the basis of (133b), I suggest that *to* is specified in the lexical entries of *minasu* 'regard', *nazukeru* 'name', and *naru* 'become'.

41. It remains to be seen how to relate the following usage of instrumental case in Japanese:

Taroo-ga kooen-de/*ni ason-dei-ta.
Taro-NOM park-INSTR/DAT play-PROG-PAST
'Taro was playing in the park.

Tarop-ga kooen-ni/*de i-ta.
Taro-NOM park-DAT/INSTR stay-PAST
'Taro stayed in the park'.

42. An alternative to (142a)-(142d) is to adopt a version of the elsewhere condition (Kiparsky 1973; cf. Koutsoudas et al. 1974). The constraints, (46a), (46b), (133a), and (133b), may be ranked in terms of **restrictiveness** (Smith 1992: 58), which is defined in the following way:

A linker X is said to be *more restrictive than* a linker Y iff X's linking specifications (LINK value) properly contains Y's.

(46a) Non-macroroles take DATIVE case.
(46b) LS arguments take NOMINATIVE case.

(133a) Themes or effectors which have a non-macrorole value take INSTRUMENTAL case.
(133b) Themes or effectors which have a non-macrorole value and undergo "conjunct splitting" take COMITATIVE case.

These four constraints may be ranked in the following way on the basis of subsumption:

(133b) > (133a) > (46a) > (46b)

That is, the linking specification in (133b) properly contains that in (133a), which, in turn, contains that in (46a). The linking specification in (46a) properly contains that in (46b). Under this proposal, we may attribute the contrast between Kabardian and Korean to whether or not they have the constraints (133a) or (133b), and not to how they are ranked with respect to (46a). One major problem with this approach is that there are some languages such as Japanese, French, and Imbabura Quechua (see Section 3.3.2 for data and discussion) which require (46a) or even (133a) to be ranked lower than (46b). This ranking does not follow from the Elsewhere Condition.

43. An alternative would be to rank (46a), (146a), and (146b) on the basis of subsumption in the order given below:

(146b) > (146a) > (46a)

Under this proposal, we may attribute the contrast between Japanese and Guugu Yimidhirr to the fact that Guugu Yimidhirr has the constraints (146b), while Japanese does not. Likewise, we may attribute the contrast between English and Spanish to the fact that English has both (146a) and (146b), while Spanish has only (146b).

44. It remains to be investigated how to account for a neutralization between ablative and instrumental case (e.g. Hua; see Croft 1991). This neutralization might be attributed to the fact that both instrumental and ablative case what may be described as **source** (Clark and Carpenter 1989).

45. Nakamura (1995a, 1995b) treat the following case alternation together with the alternations in (161)-(165), but I leave it open whether it is appropriate to do so or not:

Taroo-ni	wain-ga	nom-e-ru.
Taro-DAT	wine-NOM	drink-can-PRES
Taroo-ga	wain-o	nom-e-ru.
Taro-NOM	wine-ACC	drink-can-PRES

'Taro can drink wine'.

46. See Inkelas et al. (1996) for discussion of the status of constraint re-ranking within a language. I choose to appeal to the concept of tied constraints because of the productivity of this two-way passivization.

47. The proposal made in this chapter is concerned with production, i.e. how to proceed from semantic representations to case frames, and not with comprehension. One crucial question that has been left unanswered up to this point is how to "recover" semantic representations, i.e. a combination of thematic relations and macroroles, from surface case frames. My proposal is to adapt the procedure of **lexicon optimization** (Prince and Smolensky 1993; see also Smolensky 1996), i.e. using the same OT grammar in evaluating a set of possible semantic representations for a given surface case frame. Note that an OT grammar as proposed here leaves underspecified thematic relation values of actors, undergoers, and non-macrorole values (especially when they are marked by dative case, the default case for non-macroroles which provides no clue as to their thematic relation values). This is where AUH and MAP come into play. They interact with the optimal combination of macrorole values and the LS of the predicate in order to ensure correct comprehensions, i.e. a correct association between thematic relations (or rather a LS) and macroroles. This comprehension process may be sketched as follows:

Input: A Case Frame

An OT Grammar (i.e. a particular ranking of Con)

Output: A Combination of Macrorole Value(s)

Actor-Undergoer Hierarchy [AUH]
Macrorole Assignment Principles [MAP]

A Logical Structure [LS] of a Predicate

The following represents production procedure:

Output: A Case Frame

An OT Grammar (i.e. a particular ranking of Con)

Input: A Combination of Macrorole Value(s)

AUH and MAP

A Logical Structure [LS] of a Predicate

We may select the optimal combination of macrorole values on the basis of a surface case frame if we apply the same constraint hierarchy as used in determining a correct case frame. What is important here is that the above system of grammar is unbiased with respect to production or comprehension, since it uses the same resource, i.e. the OT grammar, AUH, and MAP. Although I leave it to another occasion to investigate how to accommodate into this system voice changes (passive/antipassive) and complex sentences such as control and raising constructions (i.e. non-subordinate core junctures), the above discussion provides initial plausibility of my proposal, which is intended as an alternative to the set of linking procedures developed by Van Valin (1993) and Van Valin and LaPolla (in press: Ch.9).

48. It has been proposed in OT phonology (e.g. Demuth 1995, Gnanadesikan 1995, Itô and Mester 1995, Yip 1993) that markedness constraints are invariably ranked, while only faithfulness constraints (e.g. PARSE, FILL) undergo re-ranking.

49. See Battistella (1990), Tiersma (1982), and Witkowski and Brown (1983), among many others, for further illustrations and discussion of markedness.

50. Jelinek (1984) seeks to attribute the source of split-ergativity to the syntactic status of NPs, illustrated in Warlpiri, under the pronominal argument hypothesis. See Austin and Bresnan (1996), however, who reject the hypothesis in favor of what they term the dual structure hypothesis. I follow Austin and Bresnan (1996) in assuming that split-ergativity is orthogonal to the syntactic status of NPs. These two clusters form **complementary prototypes** (see Croft 1990).

51. (172) is far from an exhaustive list of relevant parameters. Other parameters include mood (e.g. Marubo), clause type (subordinate/main) (e.g. Päri, Shokleng), focus (e.g. Mparntwe Arrernte: Wilkins 1990), (172) describes two unmarked combinations of semantic and/or pragmatic features which are grouped together around actors and undergoers (in transitive clauses).

Chapter 7

Conclusion

7.1 Summary

This work has outlined the OT-based case theory which is designed to apply to the linking system developed within the framework of RRG and applied it to a selected set of constructions in Korean, Japanese, Icelandic, and Imbabura Quechua, the irregular case frames of which have presented a challenge to syntactic theories. This process began with a critical examination of Van Valin (1991) and Van Valin and LaPolla (in press) in Chapter 3, which led me to introduce a set of assumptions from OT, most importantly the following two:

(1) a. A grammar may be expressed as a dominance hierarchy of (universal) constraints.
b. Typological variation is derived from re-ranking of those constraints.

The architecture of OT made it possible to derive the typological variation of case systems from re-ranking of the following four universal constraints:

(2) a. Non-macroroles take DATIVE case.
b. LS arguments take NOMINATIVE case.
c. Undergoers take ACCUSATIVE case.
d. Actors take ERGATIVE case.

The OT-based grammar of case takes as input a combination of thematic relation and macrorole values licensed by a verb and outputs its optimal case frame. It was shown that split-ergative case systems such as Dyirbal also fall within the scope of (2a)-(2d) with necessary refinements. Some care has also been taken of oblique cases, in particular instrumental and comitative case, in addition to core cases (i.e. nominative, accusative, ergative, and dative). It has been suggested how constraints which assign oblique cases form a case system with the universal constraints (2a)-(2d). What was striking there is that even constraints which license oblique cases may have cross-linguistic applicability.

Chapters 4-6 are devoted to determining appropriate inputs, i.e. a combination of thematic relation and macrorole values supplied by a variety of constructions, to the OT-based grammar of case outlined in Chapter 3. Chapter 4 showed that the associations of thematic relation and macrorole values provide a basis for the case assignment of psych verbs in Japanese. It was demonstrated that their case frames are produced as output by the OT-based grammar of case which takes as input the associations of thematic relation and macrorole values they involve. It was argued in Chapter 5 that a multiple association between the thematic relation and macrorole tier which arises from underspecification of macrorole values accounts for "case spreading" and "case stacking" in Korean, Japanese, Icelandic, and Imbabura Quechua. Chapter 6 extends this approach to handle a set of case frames displayed by a variety of raising constructions in Icelandic and Korean. It was shown that case preservation phenomena in Icelandic subject-to-subject raising and subject-to-object raising constructions are handled with no modification to (2) under the proposal made in Chapter 3 to assign cases to LS arguments, not to phrase structure. Another focus in Chapter 6 was on possessor raising and light verb constructions in Korean. It was proposed that both involve a coordination of LSs licensed by entailment. The coordinated LSs exists in parallel and are associated with the macrorole tier independently. This multiple association between the macrorole tier and the thematic relation tier explains multiple-nominative/accusative/dative case frames exhibited by possessor raising and light verb constructions. Chapters 4-6 all verified the OT-based approach to case, according to which the grammar receives as input a combination of thematic relation and macrorole values of a verb and outputs its optimal case frame(s).

7.2 Areas for Future Research

As the above summary has revealed, the general theory of case which applies OT to RRG, in particular its linking system with the two-tiered system of semantic roles (thematic relations and macroroles), has been shown not only to derive the typological variation of

case systems, but also to handle a set of irregular case frames displayed by a variety of constructions in accusative languages, e.g. psych verb, double-nominative/accusative, and raising constructions, on the basis of the RRG linking system. However, there remain many interesting empirical issues which require further research and elaboration. I conclude by mentioning a few of the more significant of these issues.

First, it was left as an open question in Chapters 3 and 5 how to account for accusative and nominative cases which mark those adverbial NPs in Korean which may be grouped together under the rubric of situation delimiters (Wechsler and Lee 1996).[1] Korean examples are given below (K.-S. Park 1994):

(3) a. Chelswu-ka twupen-ul oych-ess-ta.
Chelsoo-NOM two.times-ACC yell-PAST-DEC
'Chelsoo yelled twice'.

b. Uyca-ka twupen-i/#ul pwuse-ci-ess-ta.
chair-NOM two.times-NOM/ACC break-PASS-PAST-DEC
'The chair was broken twice'.

c. Chelswu-ka twupen-ul chayk-ul ilk-ess-ta.
Chelsoo-NOM two.times-ACC book-ACC read-PAST-DEC
'Chelsoo read the book two times'.

d. Chayk-i twupen-i/#ul ilk-hi-ess-ta.
book-NOM two.times-NOM/ACC read-PASS-PAST-DEC
'The book was read twice'.

e. Cheli-ka Mary-lul panci-lul twu pen-ul
Cheli-NOM Mary-ACC ring-ACC two.times-ACC

senmul-ul hay-ss-ta.
gift-ACC do-PAST-DEC

'Cheli presented Mary with a ring twice'.[2]

f. Mary-ka panci-ka twu pen-i senmul-i
Mary-NOM ring-NOM two.times-NOM gift-NOM

toy-ess-ta.
become-PAST-DEC

'Mary was presented a ring twice'.

Some speakers accept the accusative marking of frequency/duration adverbial NPs in passivized sentences like (3b) and (3d) (K.-S. Park 1994). What is striking about Korean

is that these adverbial accusative cases change into nominative cases under passivization the same way as those on direct objects. Similar adverbial uses of accusative case are attested in other languages, e.g. Russian, Icelandic (Smith 1992, Zaenen et al. 1985), Finnish (Maling 1993). Finnish examples (4a), (4b), (4c,d), and (4e,f) correspond to (3a), (3b,d), (3c), and (3e,f), respectively (Maling 1993):

(4) a. Minä viivyin matkalla viikon.
1SG:NOM stay:1SG trip:ADE week:ACC
'I stayed on the trip a week'.

b. Lapsen oli jano yhden illan.
child:GEN be:PAST thirst:NOM one:ACC evening:ACC
'The child was thirsty for one evening'.

c. Liisa muisti matkan vuoden.
Liisa:NOM remember:PAST trip:ACC year:ACC
'Liisa remembered the trip for a year'.

d. Minä luen kirjan kolmannen kerran.
1SG:NOM read:PAST book:ACC third time:ACC
'I read the book for a third time'.

e. Luotin Kekkoseen yhden vuoden
trust:1SG Kekkonen:ILL one.year:ACC

kolmannen kerran.
third time:ACC

'I trusted Kekkonen for a year for the third time'.

f. Kekkoseen luotettiin yksi vuosi
Kekkonen:ILL trust:PASS one year (NOM)

kolmannen kerran.
third time:ACC

'Kekkonen was trusted for a year for the third time'.

Comparison of (3) with (4) suggests the following contrasts between Korean and Finnish:

(5) Unergative Predicates: (3a)/(4a)
Both Korean and Finnish allow unergative predicates to occur with adverbial NPs, e.g. duration (4a), frequency (3a), which are marked by accusative case.

Unaccusative/Passivized Predicates: (3b,d)/(4b)
Finnish allows unaccusative predicates (4b) to occur with adverbial NPs which are marked by accusative case, while Korean normally does not allow unaccusative or passivized predicates to occur with accusative-marked adverbial NPs (some native speakers do accept the nominative form).

Transitive Predicates: (3c,e)/(4c,d,e)
Both Korean and Finnish allow transitive predicates to occur with adverbial NPs which are marked by accusative case. All accusative cases on adverbial NPs change into nominative case under passivization (together with accusative cases on direct objects), while not all accusative cases on adverbial NPs change into nominative cases in Finnish, as illustrated by (4f), in which *yksi vuosi* 'for a year', but not *kolmannen kerran* 'for the third time', takes nominative case under passivization.

The fact that accusative cases on adverbial NPs which represent duration and frequency may turn into nominative cases under passivization in Korean makes it tempting to extend the treatment of "case spreading" in Korean, proposed in Chapter 5, to (3b)-(3f) and claim that those adverbial NPs receive an undergoer value from the direct object NPs in (3c,e) and the subject NPs in (3b,d,f) if their macrorole values are left unspecified.[3] However, this move leaves (3a) unexplained, where no undergoer value is available.[4]

Finnish presents a much more complicated situation in which some, but not all, accusative-marked adverbial NPs may take nominative case under passivization, as shown in (4f).[5,6] It is interesting to note in this connection that like Icelandic, German, Latin, and Classical Greek (Smith 1992: 112-118), Russian normally allows no case alternation on accusative-marked adverbial NPs (Fowler and Yadroff 1993):

(6) a. On cital *Plennicu* vsju noc.
he read *La Prisonnière* all night:ACC
'He read *La Prisonnière* all night'.

b. Plennica citalas' vsju noc.
La Prisonnière was.read all night:ACC
La Prisonnière was read all night'

(7) a. On pisal kursovuju ravotu vsju noc.
he wrote course paper all night:ACC
'He wrote his term paper all night'.

b. Kursovaja rabota pisalas' vsju noc.
course paper was.written all night:ACC
'The term paper was written all night'.

These accusative cases on adverbial NPs in Finnish and Russian which do not undergo case alternations under passivization may be taken as lexicalized, in sharp contrast to those in Korean.[7] From above, we may put Finnish between Korean and Russian on a spectrum concerning the degree of lexicalization of accusative case on adverbial NPs:

(8) Korean ----------> Finnish ---------> Russian

These languages are ordered from left to right according to the progress of lexicalization of accusative cases on adverbial NPs. In contrast to Korean, which allows the constraint (2c) to assign accusative case to certain adverbial NPs, Russian simply fills in accusative case in advance as the case values of those adverbial NPs. Finnish comes somewhere in between. It is interesting to note in this connection that a few speakers of Korean accept accusative-marked adverbial NPs only, and not nominative-marked ones (Kyung-Shim Kang personal communication). Together with the fact that some speakers allow accusative-marked adverbial NPs to occur with passivized predicates as in (3b,d), this may be taken as a piece of evidence that lexicalization is in progress even in Korean.[8, 9]

Although it seems promising to capture the differences among Korean, Finnish, and Russian with respect to the degree of lexicalization of adverbial accusative cases, I have to leave it to another occasion to verify this lexicalization hypothesis typologically.[10,11]

The second major area of research needed is the case marking patterns of complex predicate constructions.[12] This work treats one of them (light verb constructions), while giving only a cursory look at causative constructions in Italian and Korean in Chapters 2 and 5. It remains to be done to explain a set of case frames exhibited by a set of complex predicate constructions, in particular causative constructions, on the basis of the OT-based theory of case outlined in Chapter 3.[13] For illustration, consider the following three-way case alternation on the causee NP in Korean:

(9)	a.	John-i John-NOM	haksayng-eykey student-DAT	pap-ul rice-ACC	mek-i-ess-ta. eat-CAUS-PAST-DEC
	b.	John-i John-NOM	haksayng-ul student-ACC	pap-ul rice-ACC	mek-i-ess-ta. eat-CAUS-PAST-DEC
	c.	John-i John-NOM	haksayng-ulo student-INSTR	pap-ul rice-ACC	mek-i-ess-ta. eat-CAUS-PAST-DEC

'John made students eat the rice'.

J.-W. Park (1994) notes that the causee NP may be marked by instrumental case, whether the dependent predicate is transitive or intransitive.

The macrorole assignments in (9a) and (9b) proceed in the manner of (10a) and (10b), respectively:

(10) a. [**do'** (J, Ø)] CAUSE [[**do'** (s..., Ø) CAUSE [BECOME **eaten'** (rice)]]

Th.Rel.:	Effector	Effector	Patient
MR:	Actor	(Non-MR)	Undergoer

b. [**do'** (J, Ø)] CAUSE [[**do'** (s..., Ø) CAUSE [BECOME **eaten'** (rice)]]

Th.Rel.:	Effector	Effector	Patient
MR:	Actor		Undergoer

We saw in Chapter 5 that (10b) receives support from passivization and long-distance quantifier floating. Similar macrorole assignments were posited in Chapter 5 for transitive causative constructions in Imbabura Quechua, repeated below:

(11) a.

taita-ca	wambra-man	papa-ta	alla-chi-rca.
father-TOP	boy-DAT	potato-ACC	dig-CAUS-3:PAST

b.

taita-ca	wambra-ta	papa-ta	alla-chi-rca.
father-TOP	boy-ACC	potato-ACC	dig-CAUS-3:PAST

'Father had/made the boy dig potatoes'.

A question that arises now is how to explain the instrumental case on the causee NP in (9c). Recall from Chapter 3 that instrumental case is defined as follows:

(12) Instrumental Case
Effectors with no actor value or themes with no undergoer value (i.e. effectors and themes with a non-macrorole value) get instrumental case.

It is reasonable to try to find a way to extend (12) to (9c). My proposal is given in (13):

(13) Lexical Rule
[**do'** (x, Ø)] CAUSE [[**do'** (y, Ø)] CAUSE [**predicate'** (...)]]
---------> [[**do'** (x, Ø)] CAUSE [**do'** (y, Ø)]] CAUSE [**predicate'** (...)]

The lexical rule in (13) causes a re-bracketing which groups together '[**do'** (x, Ø)]' and '[**do'** (y, Ø)]'. This re-grouping licenses (9c) to share a sequence of activity predicates with (14), whose LS is given in (15):

(14)

John-i	yelsoy-lo	mwun-ul	yel-ess-ta.
John-NOM	key-INSTR	door-ACC	open-PAST-DEC

'John opened a door with a key'.

(15) [[**do'** (John, Ø)] CAUSE [**do'** (key, Ø)]] CAUSE [BECOME **opened'** (door)]

Compare (15) with (16), which is the LS of (9c):

(16) [[**do'** (John, Ø)] CAUSE [**do'** (student, Ø)]] CAUSE [BECOME **eaten'** (rice)]

A look at (15) and (16) reveals that they are isomorphic, i.e. use the same LS schema. Given (12) and (13), it is easy to see that this isomorphy allows the instrumental case *lo* to appear on the causee NP *haksayng* 'student' in (9c). This re-bracketing account may be extended to handle intransitive causative constructions whose causee NPs are marked by instrumental case.[14]

It remains to be seen, however, whether the above account extends to other languages including French, illustrated in (17a,b), Hindi, illustrated in (18a,b) (Saksena 1982: 49), and Bolivian Quechua, illustrated in (19a,b) (Van Valin and LaPolla in press: Ch.9):

(17) a. Je ferai manger les pommes à
1SG make:FUT eat the apples DAT

Pierre.
Pierre

b. Je ferai manger les pommes par
1SG make:FUT eat the apples INSTR

Pierre.
Pierre

'I made Pierre eat the apples'.

(18) a. mai-ne raam-ko kitaab parh-vaa-ii.
1SG-ERG Ram-DAT book:NOM read-CAUS-PERF

b. mai-ne raam-se kitaab parh-vaa-ii.
1SG-ERG Ram-INSTR book:NOM read-CAUS-PERF

'I made Ram read the book'.[15]

(19) a. Nuqa-Ø Fan-ta rumi-ta apa-ci-ni.
1SG-NOM Juan-ACC rock-ACC carry-CAUS-1SG

b. Nuqa-Ø Fan-wan rumi-ta apa-ci-ni.
1SG-NOM Juan-INSTR rock-ACC carry-CAUS-1SG

'I made Juan carry the rock'.[16]

It is also important to investigate whether or not a prediction made by (13) is borne out cross-linguistically: the causee may be marked by instrumental case only when a dependent verb has an activity predicate (i.e. [**do'** (x, [...])]) in its LS.[17, 18]

Finally, no attempt was made in this work to incorporate ergative and active case systems except for their canonical simple sentences in Chapter 3. In order to demonstrate the cross-linguistic applicability of the framework outlined in Chapter 3, a detailed analysis of particular ergative and active case systems needs to be done. RRG, to which OT is applied, has been applied to a wide range of languages (see Van Valin 1993 and articles therein), and this fact will probably serve as a check on any conceivable biases which may have developed in my own research, which has centered around only four accusative languages, Korean, Japanese, Icelandic, and Imbabura Quechua.

Notes

1. Wechsler and Lee (1996) observe that when these adverbial NPs are accusative-marked, they transfer the quantificational effect from the domain of objects to events as whole (cf. Krifka 1989). It is interesting to note that this property (**incremental theme**) is one of proto-patient properties (Dowty 1991).

2. The macrorole assignment in (3e) proceeds as follows, apart from the frequency adverb *twu pen* 'two times':

[**do'** (C, Ø)] CAUSE [INGR **exist'** ([[**do'** (C, Ø)] CAUSE [**have'** (M, ring)]])]

Actor Undergoer

[**do'** (C, Ø)] CAUSE [INGR **have'** (M, ring)]

First, (3e) involves a coordinated LS licensed by entailment (Ch.6). Second, the recipient NP *Mary* in the lower LS receives an undergoer value from the theme NP *panci* 'ring' through spreading (Ch.5). This two-stage analysis allows *senmul* 'gift', *panci* 'ring', and *Mary* in (3e) to share the same undergoer value and receive accusative case. This, in turn, explains why all of them have to take nominative case under passivization in (3f).

3. Affectedness condition, which was shown to motivate "case spreading" in ditransitive/morphological causative constructions in Korean in Chapter 5, does not extend to handle these examples. However, it is important to notice that affectedness and delimitedness, which Wechsler and Lee (1996) argue is associated with the accusative case marking on the adverbial NPs, are typically associated with undergoers or proto-patients (Dowty 1991; cf. Ackerman and Moore 1994).

4. Wechsler and Lee (1996) propose that case is assigned to these situation-delimiting adverbials through the same process which assigns direct case to arguments, under the assumption that the lexical entry of a predicate specifies a set of arguments to which it assigns direct case. This approach licenses *twu-pen* 'two times' in (3a) to be accusative-marked. My suggestion is to follow the spirit of Wechsler and Lee (1996) in assuming that these situation-delimiting adverbial NPs may optionally receive an undergoer value even if the verbs are intransitive lexically.

5. The fact that adverbials of duration and frequency (as well as measure phrases and cognate objects), like direct objects, receive partitive case under negation in Finnish (Maling 1993) seems to lend further support to my proposal to regard them as having an undergoer value. This would simplify the account of the accusative/partitive alternation. See Franks and Dziwirek (1993) for data and discussion.

6. Some adverbial NPs receive nominative case alone under any circumstance in Finnish, while a fair number of common adverbial NPs take either accusative or partitive case (Maling 1993: 53).

7. The Russian situation is slightly more complicated. Unergative verbs such as 'hop' may allow passivization of an accusative-marked adverbial NPs which denote duration only when the temporal prefix *pro-* is attached to those unergative verb (Fowler and Yadroff 1993: 257-258):

On	proprygal	na	odnoj	noge	ves'	den'.
he	hopped.through	on	one	foot	all day:ACC	

'He spent all day hopping on one foot'.

?Ves'	den'	byl	proprygan	(im)	na	odnoj	noge.
all day:ACC	was	hopped.through	by him	on	one	foot	

'All day was spent by him hopping on one foot'.

These examples show that the sentence is transitivized as a result of the addition of the prefix *pro* to the verb. Icelandic also allows an adverbial of path or distance to undergo passivization when it is the only postverbal NP in the clause (Zaenen et al. 1985: 474-475). This option is not available in Korean.

8. By "lexicalization", I mean filling in the accusative (or nominative) case feature in the case attribute of those adverbial NPs.

9. One possible alternative would be to follow Smith (1992) in claiming that these adverbial accusative cases are a kind of default marker. However, the default account is questioned by the case alternations illustrated in (3), since the default case is not expected to alternate with other cases. It is interesting to note in this connection that Smith (1992) avoids treating Korean case systems, which have both multiple-nominative and multiple-accusative case frames. This should not happen in his typology of case systems (Smith 1992: Ch.3).

10. There are individual differences in which adverbial NPs lexicalize accusative case in Finnish and Korean.

11. I also have to work on how to account for genitive/partitive case, which play a prominent role, especially in Slavic languages.

12. See Roberts (1995) for a RRG account of applicative constructions in Bantu languages (Chichewa, Kinyrwanda), Dyirbal, and Balinese. She claims, elaborating on Van Valin's (1993: 69-72) suggestion, that there are two types of applicative constructions: (i) promotion of non-arguments to direct core arguments (e.g. Kinyrwanda, Kichaga); and (ii) promotion of non-macrorole arguments/adjuncts to undergoers (e.g. Tzotzil).

13. Italian and French/Spanish causatives exhibit interesting contrasts with respect to auxiliary selection, reflexivization, passivization, clitic climbing, and "downstairs freeze" (Rosen 1983). These contrasts have been attributed to that between **full merger** (Italian) and **partial merger** (French/Spanish) (Rosen 1990; cf. Marantz 1984) or that between **monoclausal** (Italian) and **biclausal** (French/Italian) in terms of **argument structure** (Dalrymple et al. 1995, Frank 1996). My proposal is to adapt these previous accounts to the current framework by exploiting the distinction between thematic relations and macroroles (see Section 2.3.6 for details). Both Italian and French/Spanish causative constructions may assign a pair of actor and undergoer, while they differ as to whether they involve one **controller** (which may be equated with **a-subject** in LFG) or two. Italian involves one controller, while French/Spanish counterparts involve two. The difference between this account and the LFG account comes down to whether they refer to grammatical relations or macroroles as well as thematic relations (or argument structure). It is not clear to me whether this contrast makes any empirical difference or not:

	RRG	LFG: A-Structure	GB (Rosen 1990)
Italian	one controller	monoclausal	full merger
French/Spanish	two controllers	biclausal	partial merger

14. Two comments are in order about the (13). First, it obviates the need to assume passivization (where there is no passive morpheme!) for the purpose of "suppressing" the external argument (e.g. Rosen 1990). (13) is also consistent with the fact that unaccusative verbs cannot occur in the complement when the causee NP is marked by instrumental case (Zubizarreta 1985). Second, it is possible for (12) to assign instrumental case to the causee NP in (10a) even with no appeal to (13), since it occupies the first argument slot of **do'** (i.e. effector) which does not receive an actor (or undergoer) value. In order to make sure that this re-bracketing licenses the instrumental assignment, it is necessary to render the definition of instrumental case in (12) in such a way as to exclude effectors like *haksayng* 'student' in (10a) which occur at the beginning of causal chain.

15. The Hindi postposition *se* seems fall under (12) (Mohanan 1990: 78):

raam-ne dande-**se** saap-ko maaraa.
Ram-ERG stick-INSTR snake-DAT kill-PERF
'Ram killed the snakec with a stick'.

16. I have no information on how wan is used in other contexts. Imbabura Quechua uses the same morpheme wan in the following way (Jake 1985: 25):

wambra-ca pala-**wan** alla-rca-mi.
boy-TOP shovel-INSTR dig-3PAST-VAL
'The boy dug with the shovel'.

jari-ca warmi(**wan**)-ga ri-rca-mi.
man-TOP woman(INSTR)-TOP go-3PAST-VAL
'The man went with the woman'.

Since the postposition *wan* in Imbabura Quechua seems to be cognate with *wan* in Bolivian Quechua, it is not unreasonable to assume that *wan* in Bolivian Quechua also falls under the scope of (12).

17. Catalan does not have this semantic restriction (see Alsina 1993).

18. It also remains to be seen how to explain the dative marking on the intransitive causee NPs in the following Japanese example (see Matsumoto 1992 and Shibatani 1976, among many others).

Taroo-ga Hanako-o hasir/aruk-ase-ta.
Taro-NOM Hanako-ACC run/walk-CAUS-PAST
'Taro made Hanako run/walk'.

Taroo-ga Hanako-ni hasir/aruk-ase-ta.
Taro-NOM Hanako-DAT run/walk-CAUS-PAST
'Taro let Hanako run/walk'.

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